

C40 CLEAN AIR ACCELERATOR

**How cities are cleaning
the air we breathe**

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2023 Report

**C40
CITIES**

ACKNOWLEDGEMENTS

This report was created in collaboration with officials in the C40 Clean Air Accelerator signatory cities, C40 staff, the Clean Air Fund and other C40 funders. Thank you to everyone who has contributed to the report and the actions that are driving forward immediate and inclusive climate solutions to achieve the commitments of the C40 Clean Air Accelerator. For further information on the C40 Clean Air Accelerator, please check out the accelerator [webpage](#).

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FOREWORD

Breathing clean air is a human right, but according to the World Health Organization (WHO), 99% of the world's population live in areas that exceed air pollution limits. This is a major threat for public health, particularly for those whose health is already compromised or vulnerable, including the elderly, children, and people living with disabilities. Historically marginalised communities are also disproportionately impacted by air pollution, due to factors including race and income. Tackling intersecting health and environmental injustice and inequalities is an urgent priority for cities worldwide.

Many sources of air pollution also fuel the climate crisis, such as the combustion of fossil fuels to transport people around cities and provide energy for building and industries. Cities worldwide are taking advantage of the opportunity to address these challenges simultaneously.

For C40 Co-Chairs Mayor Sadiq Khan and Mayor Yvonne Aki-Sawyer, air quality is a top priority, and they are determined to address air pollution across C40 cities. C40 mayors in all regions are leading the way in the fight against air pollution and improving residents' lives through the C40 Clean Air Accelerator.

Data shows that efforts made by C40 cities have had a significant impact, with an average 5% improvement in air quality between 2018 and 2021. That's around 94 million more C40 city residents enjoying cleaner air. But C40 mayors know that more needs to be done to protect their residents from exposure to dangerous air pollution levels and harness the benefits of clean air.

Cities have been implementing data-driven action across sectors to achieve this, with key high impact policies and programmes to establish clean air zones, deploy electric bus fleets and charging stations, expand cycle lanes and pedestrian areas, shift away from solid and fossil fuels for cooking and heating, improve and electrify waste collection, and expand green coverage to adapt to the impacts of the climate crisis. All these actions improve residents' quality of life and health, create good green jobs and reduce inequalities.

I would like to thank signatory cities for their commitment to the C40 Clean Air Accelerator and their continuous efforts to improve air quality across the globe.

Mark Watts
Executive Director of C40

INTRODUCTION

The scientific evidence is clear. Air pollution has a huge impact on quality of life for everyone. It is one of the greatest environmental threats to health, and a leading cause of non-communicable diseases (NCDs) such as asthma, heart attacks, lung cancer and stroke. Air pollution also has a direct economic impact, as it creates higher healthcare costs and loss of productivity. It also has a social impact due to its effects on mental health and quality of life, with marginalised groups being most impacted.

More than half of the world's population currently live in cities. By 2050, cities will be home to more than two-thirds of the world's population. Tackling air pollution sources in cities – including emissions from transport, energy production, buildings, waste and industrial emissions – is therefore vital.

The World Health Organization (WHO) air quality guidelines are evidenced, health-based standards for specific air pollutants. They give cities a framework to help achieve air quality that protects public health. Accurate and targeted data collection is key to designing effective policies that reduce air pollution and prioritise equity, so that all residents can thrive in liveable, sustainable and just cities.

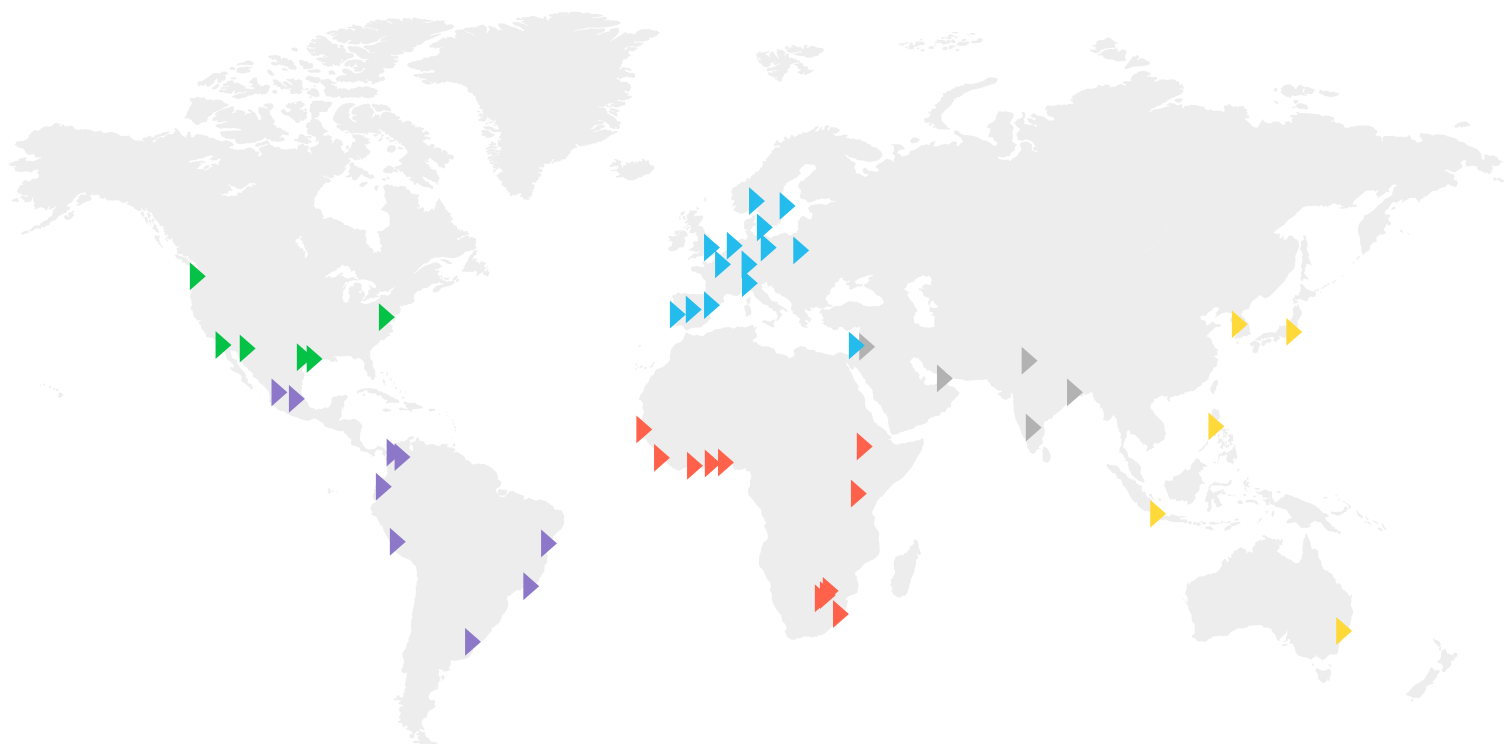
In 2019, C40 brought together 35 committed mayors united in their air quality leadership under the C40 Clean Air Accelerator, to deliver tangible results that benefit people and the planet. In the five years since its conception, cities from all around the globe have signed the C40 Clean Air Accelerator, with 50 cities currently committed to address their main sources of air pollution. Approximately 252 million people across these signatory cities will benefit from cleaner air and improved health due to the commitments made through the accelerator by reaching the WHO air quality guidelines. These commitments are:

- Within two years, establish baseline levels and set ambitious reduction targets for air pollutants that meet or exceed national commitments. These targets will put cities on a path toward meeting WHO air quality guidelines for particulate matter, nitrogen dioxide, ozone, and sulphur dioxide.
- Before 2025 or within five years of joining this commitment, implement new substantive policies and programmes to address the top causes of air pollution emissions within cities and under their control.

From the 50 cities that are signatories of the C40 Clean Air Accelerator, 47 cities were required to report this year. This report outlines the progress made in 2022–23 by these 47 cities. The information and data included covers the period September 2022 to the end of September 2023.



SIGNATORIES



- | | | | |
|-----------------------|-----------------------|----------------------|---------------------------|
| ▶ Abidjan | ▶ Dubai | ▶ London | ▶ Rio de Janeiro |
| ▶ Accra | ▶ Ekurhuleni | ▶ Los Angeles | ▶ Rotterdam |
| ▶ Addis Ababa | ▶ eThekwni | ▶ Madrid | ▶ Salvador |
| ▶ Amman | ▶ Freetown | ▶ Medellín | ▶ Seoul |
| ▶ Austin | ▶ Guadalajara | ▶ Mexico City | ▶ Stockholm |
| ▶ Barcelona | ▶ Heidelberg | ▶ Milan | ▶ Sydney |
| ▶ Bengaluru | ▶ Houston | ▶ Nairobi | ▶ Tel Aviv-Yafo |
| ▶ Berlin | ▶ Jakarta | ▶ Oslo | ▶ Tokyo |
| ▶ Bogotá | ▶ Johannesburg | ▶ Paris | ▶ Tshwane |
| ▶ Buenos Aires | ▶ Kolkata | ▶ Phoenix | ▶ Warsaw |
| ▶ Copenhagen | ▶ Lagos | ▶ Portland | ▶ Washington, D.C. |
| ▶ Dakar | ▶ Lima | ▶ Quezon City | |
| ▶ Delhi NCT | ▶ Lisbon | ▶ Quito | |

PROGRESS OVERVIEW

After a year of record-high temperatures globally, the links between climate breakdown and health are becoming even more present and acute. In order to reduce current impacts on people's health and livelihoods and avoid lasting effects that could jeopardise the way we live in cities, the twin issues of the climate crisis and air pollution need immediate action.

The good news is that signatories of the C40 Clean Air Accelerator are leading the way. This report shows that ambitious action is possible and generates multiple benefits for communities. The types of actions being implemented by cities to tackle air pollution varies depending on local context. Globally, cities are at different stages in their efforts to manage air quality. In addition, cities also have different levels of power to tackle emissions, as well as different social and economic factors to consider.

Cities like **London** and **Houston** are improving air quality monitoring networks to better understand their air pollution levels and make data-driven decisions. They are using this data to design and implement impactful and equitable action, as well as making it publicly available to residents so they can understand the air pollution they are exposed to. Since the launch of the C40 Clean Air Accelerator in 2019, 35 signatory cities have expanded their air quality monitoring networks.

Vehicle restrictions like low and zero emission areas (ZEAs) can significantly reduce the exposure of communities to toxic air. A total of 31 signatory cities have implemented regulations which control the circulation of polluting vehicles

in their cities to tackle emissions from traffic, including **Bogotá**, **Copenhagen** and **Milan**, which all have low emission zones in place, or **Johannesburg**, which is working to design and implement them. Cities are also providing better access to sustainable and clean means of transportation for their residents through a range of policies and programmes, for example **Barcelona** built nearly 1,200 km of cycle lanes between 2019 and 2023.

This report also shows how cities including **Addis Ababa** and **Seoul** are tackling other key sources of emissions by expanding access to clean energy and reducing the need to rely on fossil and solid fuels, while improving efficiency in buildings to reduce energy demands across sectors.

With the increase of signatory cities in Africa, we have also seen an increase in action to reduce waste production as well as improve waste management systems in cities including **Lagos** and **Accra**. This is helping to reduce open dumping and burning of waste, which creates harmful air pollutants. Cities including **Quito** and **Sydney** are also working to adapt to the impacts of the climate crisis and build resilience through actions like green coverage expansion.

All of these actions are putting cities on track to meet their clean air goals and the commitments of this accelerator. This report showcases the commitments from signatory cities to C40's Clean Air Accelerator and their continued action to bring residents a better quality of life, cleaner skies, and healthier lungs.

DATA ANALYSIS

COMMITMENT 1:

Signatory cities have reported this year on how they are continuing to work towards cleaning their air and meeting the air quality guidelines set by the World Health Organization (WHO). These cities are taking important steps to meet their air quality targets, committing to over 200 actions under the first commitment of the C40 Clean Air Accelerator and making progress towards implementing them. However, there is still much more to be done to achieve clean air across all C40 cities.

Signatory cities are expanding their understanding of air pollution and its impacts within their jurisdictions. Data-driven action is the most effective way to address emissions and achieve significant health and climate benefits. Cities are working to expand their air quality monitoring networks and collecting data through them. This allows for a better understanding not only of the levels of air pollution, but also of its geographical distribution as not all neighbourhoods in a city are exposed in the same way. Reference grade monitoring stations, lower-cost monitors, and hyperlocal monitoring are being employed to gather more detailed data with more than 35 signatory cities that have expanded their monitoring networks since 2019.

For example, **Jakarta** has expanded its network by deploying reference stations at three locations and introducing 14 lower-cost monitors. They are also planning to add nine more lower-cost monitors and four reference monitoring stations in 2024. **London's** air quality monitoring network has also significantly expanded, with nearly 450 monitors now deployed citywide; and **Washington, D.C.** launched a hyperlocal air quality monitoring pilot programme with a focus on equity.

Cities are also conducting studies to identify the sources of air pollution. **Lagos**, for instance, updated its emission inventory in 2023 delivering its first integrated greenhouse gas (GHG) and air quality emissions inventory; and **Dubai** concluded its particulate matter characterisation and Source Apportionment (SA) for air pollution.

Furthermore, cities are conducting studies to better understand the benefits of implementing policies to address emissions. **Rio de Janeiro**, for example, quantified the air quality, health, and economic benefits resulting from the implementation of a low emission zone (LEZ) using the C40 tool Air Quality through Urban Action (AQUA). All of this information is crucial to help cities develop their Air Quality Management Plans (AQMPs). Currently, 42 signatory cities have air quality management or equivalent plans in place, which outline their action plans to address emissions and allocate resources to combat air pollution. **Quezon City** serves as a notable example, as it recently completed its first Air Quality Management Plan, providing a long-term programme to achieve the city's clean air objectives.

Access to data not only benefits action planning, but also empowers individuals and communities with knowledge of air pollution and enables them to reduce their exposure. Cities are committed to providing publicly available data and increasing awareness of the impacts of toxic air. Efforts such as public campaigns, real-time data availability, training sessions, and educational programmes are being undertaken by cities including **Johannesburg**, **Nairobi**, **Medellín**, and **Seoul**, to raise awareness and educate residents and companies about air quality and climate issues. In **Seoul**, monitoring data is being used to alert vulnerable populations, such as children in nurseries, about extremely poor air quality and help reduce their exposure.

COMMITMENT 2:

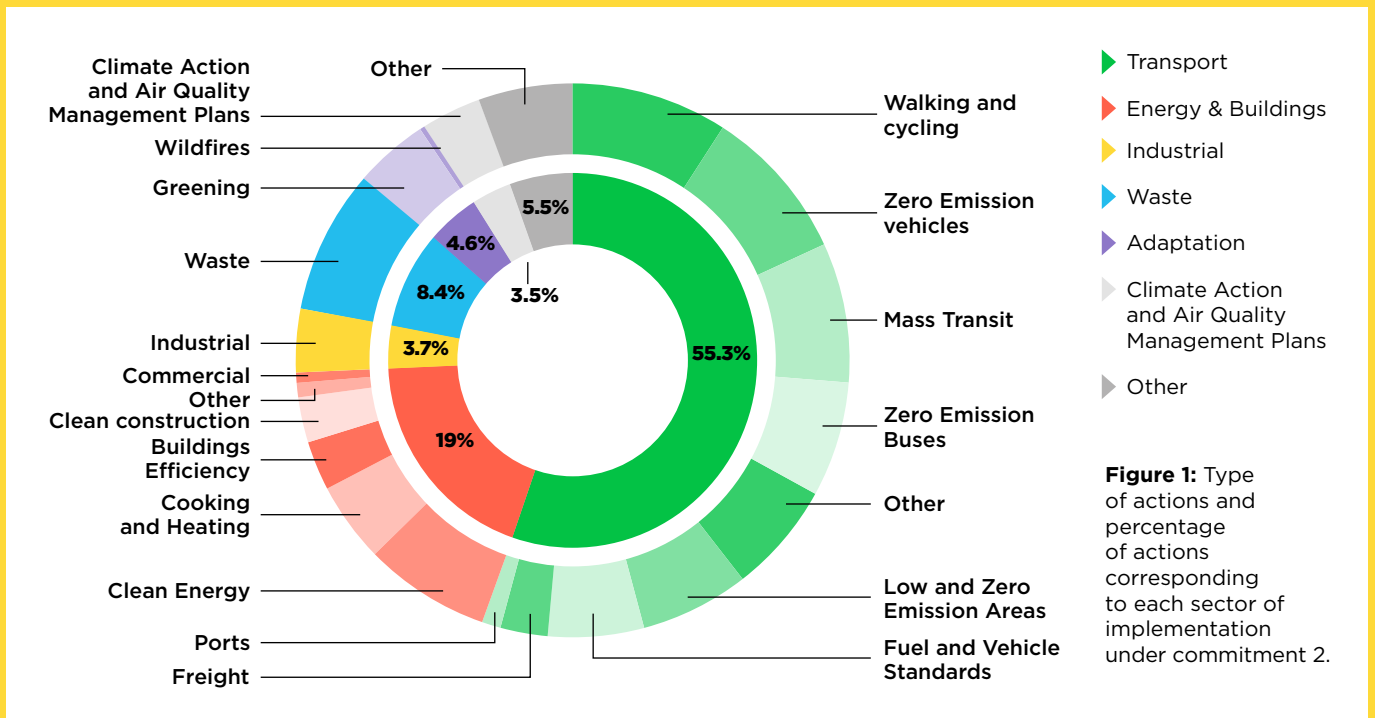
As part of their accelerator commitments, cities are taking action to address the main sources of air pollution within their control. With the addition of new signatories, cities have pledged to carry out over 550 actions to reduce emissions and improve air quality. With this increase in signatories, there has been a noticeable increase in actions focussed on tackling emissions from the waste sector, as well as a focus on expanding clean energy sources and promoting mass transit and active transport. Overall, the 50 signatory cities are making steady progress in implementing policy measures across

various sectors to address the main sources of toxic air pollution, as shown in Figure 1 and 2.

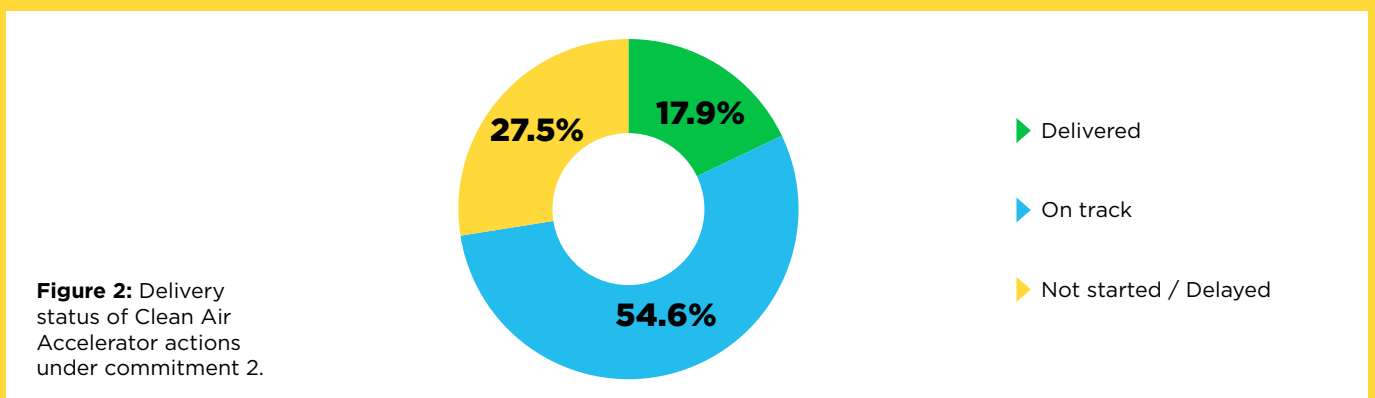
Cities continue to advance towards their set goals by implementing actions to reduce emissions across sectors. According to the latest reported information 17.9% of the committed actions have been delivered.

Comparing the progress made since the 2021 report. In 2021, the 37 signatory cities had delivered 15.3% of their planned actions, while this year the same 37 cities have now delivered 22.6% of their actions.

► Actions Under Commitment 2 of the Clean Air Accelerator By Sector



► General status of actions under commitment 2 of the Clean Air Accelerator



SECTORAL STATUS OF ACTIONS UNDER COMMITMENT 2 OF THE CLEAN AIR ACCELERATOR

Transport

Status of transport actions

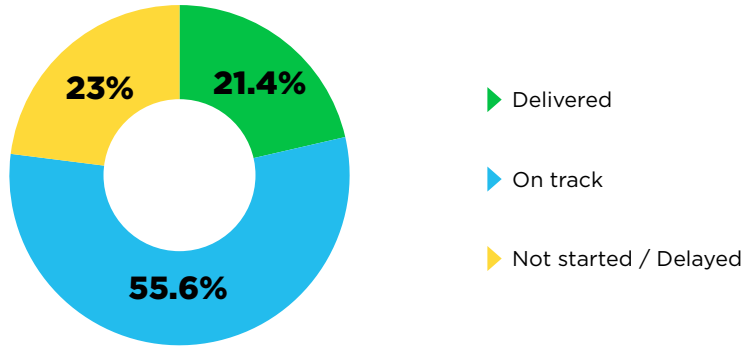


Figure 3: Delivery status of transport sector actions under commitment 2 of the Clean Air Accelerator.

Transport Actions By Type

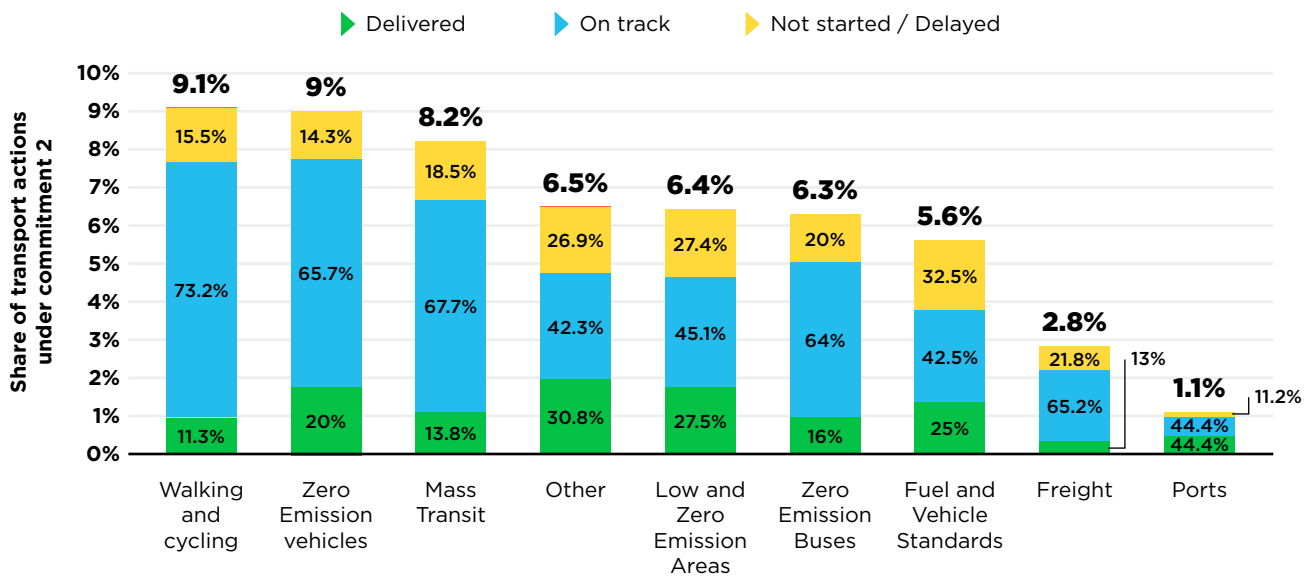


Figure 4: Type and percentage of transport actions under commitment 2. Figure also shows average action delivery status for each transport sector.

Transportation is one of the main contributors of greenhouse gases (GHGs) and air pollution in cities, through tailpipe emissions from fuel combustions of private vehicles, freight and other vehicles, as well as a result of tire wear. Therefore, cities have made significant efforts

to improve and transform the way people move around urban areas. In addition to air pollution, traffic also generates noise and negatively impacts residents' quality of life. It takes up considerable street space in cities and poses risks to pedestrian safety.



Cities are implementing measures to create more sustainable transportation systems. 46 signatory cities are delivering actions to address emissions from the transport sector as part of their commitments in the C40 Clean Air Accelerator. According to the latest report, 77% of the committed actions to tackle air pollution from the transport sector have been completed or are on track to be completed.

Reports show that reducing traffic congestion in cities brings substantial health and economic benefits. One impactful approach that is becoming very popular across C40 cities is to implement area-based vehicle restrictions in the form of clean air zones, low emission zones or zero emission zones. These high-impact actions can reduce toxic air pollution, alleviate traffic congestion, and contribute to the development of healthier, more equitable, and safer cities.

London serves as an excellent example of this. In 2023, the city expanded its Ultra Low Emission Zone (ULEZ) to cover the entire Greater London area, resulting in cleaner air for an additional five million Londoners.

Cities are also prioritising active travel as part of their efforts to build a safer, healthier, and more sustainable transport system. They are improving street safety, allocating sufficient space for pedestrians, and providing more cycling options

through the establishment of new cycle lanes, cycle hire schemes, cycle parking facilities, and increasing green spaces. An example of this is **Phoenix** which has added 100 miles of bidirectional bike lanes since 2021, bringing the total to 1,165 miles; **Madrid** has expanded its' public bicycle rental service across the entire city with a total of 611 stations and 7,500 bicycles; or **Lisbon**, which is working on the implementation of the 15-minute city concept through its 'There is Life in My Neighbourhood' Initiative (Há Vida no meu Bairro).

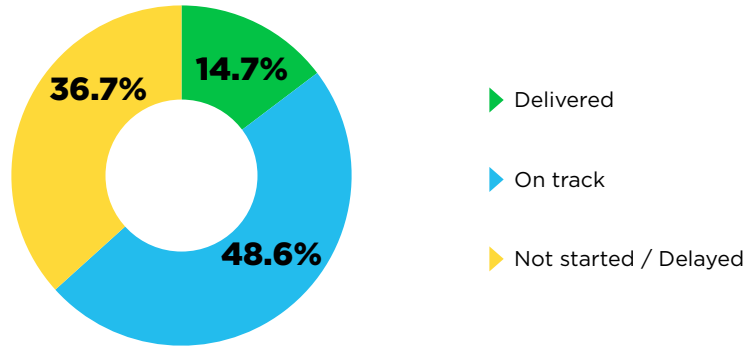
Furthermore, cities are expanding their mass transit options with a focus on equitable access, ensuring better coverage for residents and reducing reliance on private transportation. A notable example is **Mexico City's** Cablebús cable car system, which continues implementation to provide access to residents in lower-income areas. As part of their Climate Equity Plan, **Austin** is working to implement a full-scale public transportation system. **Tel Aviv-Yafo's** light rail began operation and **Quito's** first metro line was opened spanning 22 km and transforming the way people travel within the city.

Additionally, cities are working towards expanding and electrifying their bus fleets as part of their efforts to achieve sustainable transportation. For instance, **Dakar** and **Mexico City** are expanding their Bus Rapid Transit (BRT) systems; **Berlin** is procuring only all-electric buses, while other cities are moving towards that goal, such as **Bengaluru**, which procured 100 additional electric buses. Moreover, cities are increasing the availability of charging infrastructure to promote the adoption of electric vehicles among private and commercial vehicle owners. **Portland**, for instance, has amended its Zoning Code to require new multi-dwelling and mixed-use developments to provide EV-ready charging infrastructure at higher rates; other cities are also expanding their public charging points, for example **Stockholm** with over 6,000 public charging and **Rotterdam** with 3,400.

Energy and Buildings

Status of energy and buildings actions

Figure 5: Delivery status of energy and buildings sector actions under commitment 2 of the Clean Air Accelerator.



Energy and Buildings Actions By Type

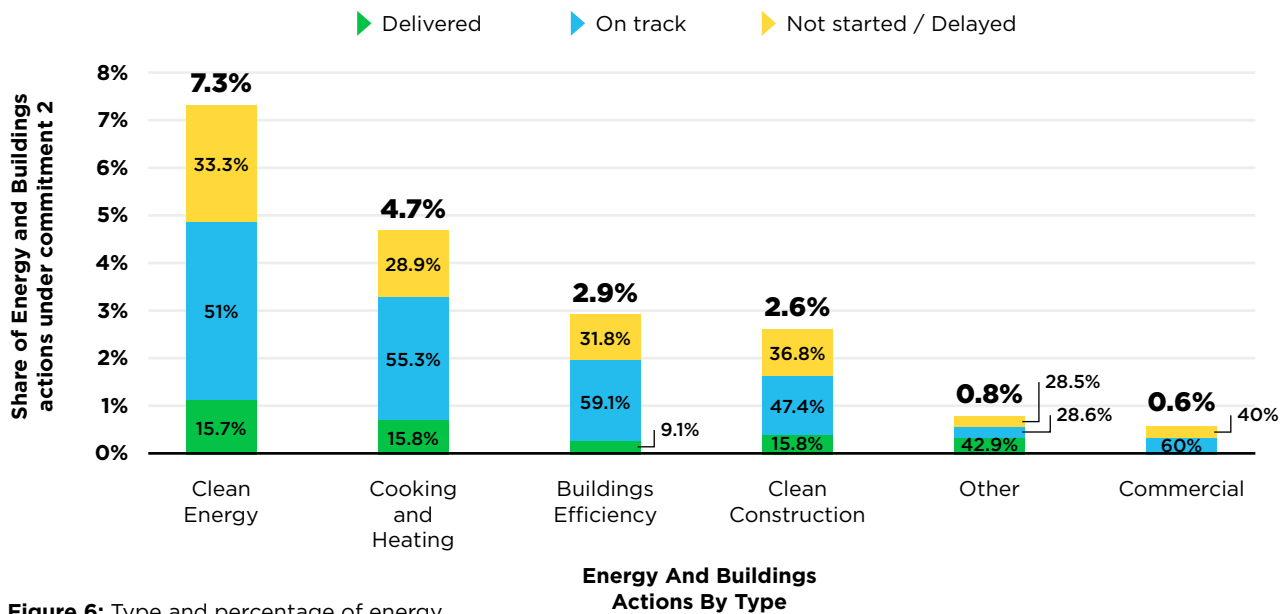


Figure 6: Type and percentage of energy and buildings actions under commitment 2. Figure also shows average action delivery status for each energy and building sector.

The building and energy sectors are also other main sources of GHGs and air pollution in cities, from the use of fossil and solid fuels for cooking and heating, energy demand and production, as well as from construction. Cities are also tracking these sources through different actions. 31 signatory cities are delivering actions to

address emissions from the energy and buildings sector as part of their commitments in the C40 Clean Air Accelerator. The latest information reported by cities on actions taken to address air pollution from these sectors indicates that 63% of committed actions have been delivered or are on track to be delivered.

One of the ways in which cities are tackling emissions is through the expansion of clean energy production in cities. This approach is expected to gradually reduce a significant share of harmful emissions. For instance, the **Ekurhuleni** Power Partners initiative has garnered agreements with over 40 Independent Power Producers (IPPs) to supply renewable energy. **Amman** is also increasing its renewable energy production through solar energy farms, the installation of solar panels on municipal buildings, and incentives for solar water heating.

Cities are also taking steps to decrease emissions from private and municipal buildings by improving efficiency and reducing the reliance on solid and fuel gas for cooking and heating. In **Portland**, the Climate Investment Plan (CIP) has been developed as a five-year roadmap to fund community-led clean energy projects and climate solutions. **Warsaw** has implemented a ban on the use of non-class coal

and wood boilers since 2023. **Amman** has passed legislation to phase out fossil fuels for heating and cooking, while **Tshwane** has approved a measure to electrify informal settlements.

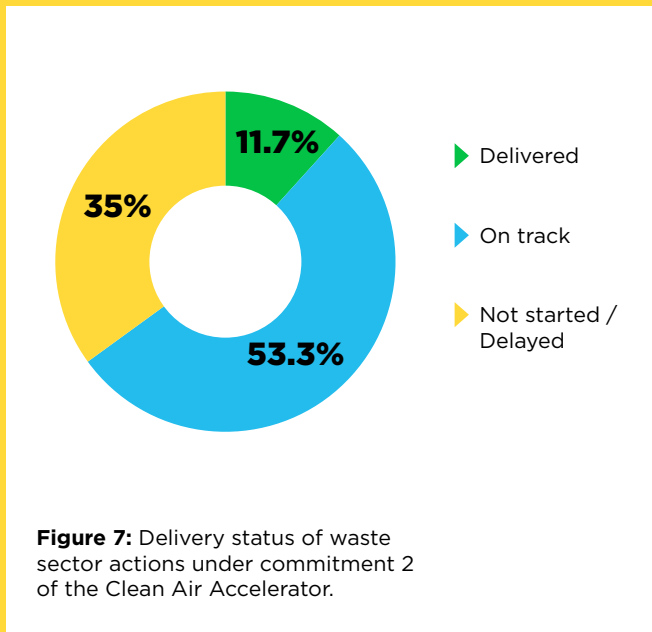
These actions are being included into cities' building codes which is a tool that many cities have specific power to regulate on. For example, **Quezon City** is in the process of amending its Green Building Code to raise the minimum energy efficiency requirements for buildings.

Cities are also monitoring and addressing emissions from construction sites. **Seoul** is providing support to retrofit old construction machinery and restricting the use of outdated equipment at municipal and large construction sites; **Delhi** has introduced guidelines to control the emission of dust from construction sites in the city, and **Oslo** requires their construction sites to be fossil-free.

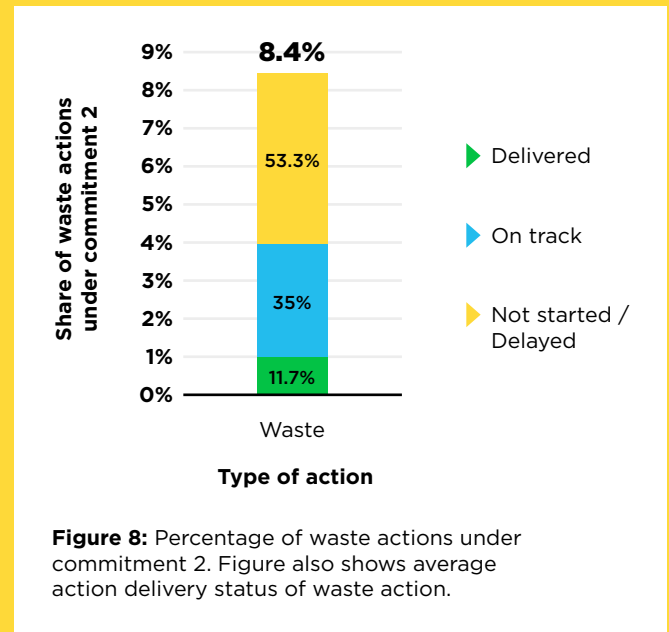


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► Status of waste actions



► Share of waste actions



Improper waste management in cities can release harmful substances that negatively impact air quality and the health of residents, such as volatile organic compounds (VOCs) including methane (the primary contributor to the formation of ground-level ozone and strong GHG) from landfills, or particulate matter and toxic chemicals from waste burning, including nitrogen oxides (NO_x), sulphur dioxide (SO₂) and VOCs. It can also lead to open dumping and burning which could aggravate the negative impact of improper waste into the environment. That is why cities are working to ensure that waste production is reduced and properly managed. 19 signatory cities are delivering actions to address emissions from the waste sector as part of their commitments in the Clean Air Accelerator. The latest information reported by cities on actions taken to address air pollution from the waste sector indicates that 63% of committed actions have been delivered or are on track to be delivered.

Cities are at various stages in their efforts to achieve zero waste. Some cities are focused on reducing waste production and transitioning to

circular systems. **Delhi**, for example, is closing landfills and utilising biomining technology to segregate and recover recyclable materials. The **Delhi** government has also implemented a ban on single-use plastics such as bags, cups, and straws.

Other cities are working to establish new waste management infrastructure to reduce waste production. **Addis Ababa**, for instance, is enhancing its waste management through the introduction of composting and recycling initiatives.

Cities are also expanding and improving waste collection services. **Guadalajara** has increased the number of solid waste collection points and has seen a 138% increase in waste collected compared to 2021. **Paris** is working towards electrifying waste collection by introducing 18 electric refuse vehicles.

Furthermore, cities are taking action against open burning practices. **Dakar** has rehabilitated former solid waste burning sites, creating job opportunities for young people. Tshwane has also conducted an awareness-raising campaign to discourage the burning of tyres.

Actions delivered by cities in other sectors

In addition to tackling emissions from the previously described sectors, cities are addressing other sources of emissions, including industrial sources. 14 signatory cities are delivering actions to address emissions from industrial sources as part of their commitments in the C40 Clean Air Accelerator.

An example of these efforts is **Los Angeles**, which recently approved an ordinance that prohibits new oil and gas extraction and requires existing extractions to cease production within 20 years; and **Ekurhuleni** is issuing licences for industrial activities with strict emissions reduction requirements and implementing new minimum emissions standards (MES) for industrial plants.



Adaptation

Through the Clean Air Accelerator, cities are also advancing actions to adapt to the impacts of the climate crisis and air pollution, with a key focus on expanding greening in cities. 19 signatory cities are delivering adaptation actions as part of their commitments in the C40 Clean Air Accelerator.

For example, the Greening **Sydney** Strategy outlines the important role of urban trees and greening to adapt to the impacts of the climate crisis and air pollution. Other cities have planted trees across the city, including **Quito**, which now has one million new trees. These actions help create a healthier, safer and equitable environment for residents. **Phoenix** has made a tree equity pledge with American Forests that will focus on planting trees where residents live and commute. In addition, these adaptation actions are key to helping deliver on other goals, like increasing active travel, by reducing exposure to heat. Phoenix's Cool Corridors Program aims to establish 100 miles of corridors by 2030 to improve walking and cycling through the expansion of green space and tree coverage within the city, with five miles having been added so far.



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CITY PROGRESS SUMMARIES

The following section of this report contains progress and action summaries that were self-reported by each of the C40 Clean Air Accelerator signatory cities. The city summaries showcase past, present, and future actions the city is undertaking to achieve the implementation milestones of the Accelerator.



SIGNATORY CITIES IN

AFRICA



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ACCRA

GHANA

Since signing the C40 Clean Air Accelerator in May 2022, Accra has focused on three key areas to help improve its air quality. These are:

1. Policy

The city administration has helped develop Ghana's National Electric Vehicle (EV) Policy as a steering committee member in the policy drafting process. This will help the country to switch from fossil fuel powered vehicles to EVs.

2. Air quality monitoring

Around 50 air quality monitors have been installed in the Greater Accra Metropolitan Area under the jurisdiction of local governments, and with support from Clean Air Fund.

3. Inclusive climate action

Accra introduced its Inclusive Climate Action Programme with the support of C40. The programme began with stakeholder engagement activities to raise awareness

of climate issues including clean air. It will support opportunities for a green and just transition, introducing new sustainability practices and technology in the waste, transport and energy sectors.

The Accra Metropolitan Assembly will roll out a new waste separation project at the beginning of 2024 as part of a sustainable circular waste approach in the city. The city has also invested in an electrified mass transit programme as part of its transition away from fossil fuel powered vehicles and towards electric vehicles. The development of the programme will be supported by the United Nations Environment Programme (UNEP).

Accra has also developed an investment case for a 500 km walking and cycling project in the city, with support from the World Health Organization. This is to help encourage residents to take short trips of between one and three kilometres on foot or by bicycle.



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ADDIS ABABA

ETHIOPIA

Since signing the C40 Clean Air Accelerator in May 2022, Addis Ababa has made significant improvements to air quality monitoring in the city. In 2023, the city introduced five additional air quality monitors.

Addis Ababa is working with key stakeholders including the Addis Ababa Environmental Protection Authority (EPA) to gather data to determine the pollution baseline in the city, with a particular focus on particulate matter (PM_{2.5}). This will help to monitor the success of clean air measures.

Addis Ababa is in the process of drafting a vehicle emission standard directive, which will impose limits on tailpipe emissions during annual vehicle inspections. The city is also developing a building energy efficiency directive. This will reduce emissions from biomass and diesel generator energy consumption, and is supported by C40's African Cities for Clean Air Initiative.

The city has also improved its waste management systems, including introducing composting and recycling initiatives. Addis Ababa's waste composting programme was recognised as one of the world's best climate projects when it won a prestigious 2022 Bloomberg Philanthropies Award.

Addis Ababa is committed to reducing emissions in the city and is raising awareness of the health and environmental benefits of using sustainable cook stoves. The city is also promoting the use of public transport, walking, cycling and electric vehicles (EVs), through infrastructure development and import policies. Addis Ababa has also increased green spaces by planting trees, which will also contribute to adaptation efforts in the city.

Said Abdella

Head, Environmental Impact Assessment, Addis Ababa Environmental Protection Authority (EPA), City of Addis Ababa

"The city is currently working on drafting a vehicle emission control directive. As vehicles are the primary contributors to emissions and pollution in our city, we are hopeful that these standards will yield positive results in addressing the challenges related to emissions and air quality."



© Karen Nash / Unsplash

DAKAR

SENEGAL

Since signing the C40 Clean Air Accelerator, the City of Dakar has made significant progress across the city’s transport, energy and waste sectors, and on various committed actions to improve air quality. This progress has been enabled by the aligned priorities and high-impact actions in the city’s Climate Action Plan (CAP).

As part of C40’s African Cities for Clean Air technical assistance programme, reference levels of atmospheric pollutant concentration and their distribution by source are currently being studied for the development of Dakar’s air quality management plan (AQMP). To support this effort, the city is working with the Center for Air Quality Management (CGQA) to strengthen its air quality management system. Thanks to this collaboration, the city increased the financial support allocated to air quality monitoring and signed a partnership protocol covering various activities. Key sectoral advances include, among others:

1. Transport

Dakar has been operating the Regional Express Train (TER) in collaboration with the central government since January 2023. The TER is 100% electric and with high mass transport capacity. The road transport sub-sector is also undergoing a transformation. The Bus Rapid Transit (BRT) project is in its final phase, operating 144 electric buses with a target of 300,000 passengers per day, also aiming to improve walking and cycling capacity.

2. Energy

Dakar is integrating renewable energy into its green and just transition, implementing a C40 Cities Finance Facility (CFF) project to boost the production of renewable energy in municipal buildings.

3. Waste

Dakar has rehabilitated former solid waste burning sites and created thousands of jobs for young people.



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EKURHULENI

SOUTH AFRICA

Since signing the accelerator in 2022, the City of Ekurhuleni has made great strides in air quality management and emissions reduction. The City of Ekurhuleni has finalised its Air Quality Management Plan (AQMP) and is awaiting internal approval.

The next stage will be another round of public participation to address concerns raised in the initial consultation process about outdated baseline studies. The Highveld Priority Area Baseline Assessment Report and emission reduction targets for the Highveld Priority Area will then be incorporated into the City of Ekurhuleni AQMP. This report will be made available once these approvals have been secured. The city will then send its finalised AQMP and proposed targets to Council for approval.

Ekurhuleni has numerous atmospheric emissions sources. These include:

- Household fuel combustion products
- Industrial releases
- Vehicle emissions
- Waste burning emissions
- Windblown dust from mine tailings (notably legacy Witwatersrand gold tailings)
- Biomass burning emissions
- Fugitive dust emissions from agricultural activities, and more

The city is committed to developing emission reduction policies, action plans, and prioritisation based on information from emission inventories and ambient monitoring for Source Apportionment (SA) by 2026.

The first phase deals with industrial emissions, followed by transport, waste and residential. The city has made progress in all areas in the last reporting year:



1. Industrial

Licensing of listed industrial activities with strict emission reduction requirements; registration of controlled emitters requiring compulsory stack emission testing and reporting; requiring dust monitoring programmes and plans. The city is currently monitoring 201 licensed industries for compliance with air quality licensing requirements. The city is also implementing the new plant minimum emissions standards (MES) to regulate industrial emissions.

2. Transport

Ekurhuleni's Integrated Public Transport Network (IPTN) identified seven routes or corridors to be implemented in phases from 2013. The city's Harambee Bus Rapid Transit (BRT), currently with three routes, continues implementation and will be completed by 2025. The project will reduce emissions by transitioning to low emission buses, including 56 Euro 5 vehicles, and low emissions minibus taxis. The service provides 8,700 average weekday passenger trips, equivalent to 580 full minibus taxi trips or 96 full bus trips. Overall, the system will contribute a modal shift away from private vehicles to a cleaner public transport.

3. Waste

By 2025, Ekurhuleni will have in operation centralised composting facilities, requiring large garden waste producers, such as golf courses and schools, to compost on site. This will divert a potential 40% of garden waste from landfills to compost. The reduction in organic waste stream to landfills will mean a decrease in the gases produced by organic waste decay, like volatile organic compounds (VOCs) and ammonia (NH₃). Through the C40 Methane Hub project, the city has delivered a waste characterisation study, to help plan the management of the produced waste. Ekurhuleni is also developing an action plan that builds on the Green City Action Plan, which has the goal to reduce 50% the waste sent to landfill. The Accra Metropolitan Assembly will roll out a new waste separation project at the beginning of 2024 as part of a sustainable circular waste approach in the city.

4. Energy

The Ekurhuleni Power Partners initiative now has over 40 Independent Power Producers (IPPs) that have signed agreements with the city to provide renewable energy. Through this programme, the city aims to develop 100 MW renewable energy capacity by 2030. This will help reduce the city's reliance on fossil fuel use for energy production, as well as its impacts on residents' health.



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ETHEKWINI

SOUTH AFRICA

Since the last reporting period in September 2022, eThekweni Metropolitan Municipality air quality officials have been trained to conduct an air quality health benefits analysis using the BenMAP programme and are now able to estimate mortality caused by poor air quality. The eThekweni Municipality manages and operates 16 real time continuous ambient air quality monitoring stations, of which one of the stations is an air mobile station. In addition, non-continuous methods, which includes passive and dust fall out sampling methods have also been established.

With the support of C40 through the African Cities for Clean Air technical assistance programme, the city is now in the process of developing a controlled fuels policy. The South Durban Basin Multipoint Plan (2006) identified that dirty fuels contribute significantly to poor air quality in the city. Some fuel burning appliances fall below the safe emissions threshold. Many facilities using dirty fuels can't maintain or invest in new abatement equipment because of the upfront and high operating costs. These present a barrier to accessing the health and environmental benefits of cleaner fuels. A legal assessment was conducted to collect data and further develop the policy. This included an assessment of the current fuels used in the city, a methodology for assessing the city powers and

the city's ability and authority to manage the use of controlled fuels within the city's boundaries. This assessment provided a list of interventions proposed to manage controlled fuels.

Data collection has improved significantly. The city hopes to improve reliability and minimise air quality monitor downtime. The city is looking into obtaining lower cost monitors to assist in monitoring congested areas where it is not feasible to have reference stations.

eThekweni is also mapping out and developing plans for a low emission zone (LEZ) after engaging with other city officials at the C40 Air Quality Network workshop in Berlin. The plan is to undertake public participation to establish LEZs. The city is taking a bottom-up approach to determine community interest in the policy. This will provide the most benefit to residents and will ensure residents are engaged in the development process.

eThekweni is also in the process of reviewing and expanding the 2008 odour management strategy, which will help reduce air pollutants like volatile organic compounds (VOCs). The city has also identified sensitive receptors which are being impacted by traffic pollution and is now in the process of sourcing funding for mitigation.



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FREETOWN

SIERRA LEONE

Freetown City Council continues to make steady progress towards achieving its commitments under the C40 Clean Air Accelerator. Early in 2023, Freetown launched its first Climate Action Plan which outlined the scope of planned interventions to tackle air quality in the city.

Although, progress in some specific areas has been constrained due to a lack of available air quality monitoring equipment and the limited capacity in technical staff. Freetown is advancing in the implementation of action to tackle emissions from the transport sector. Freetown has established a bus improvement corridor that will begin operating in February 2024. The city is also delivering a feasibility study to develop a mass transit cable car network. In addition, potential areas to implement Low Emissions Zones in the Central Business District (CBD) and Kolleh Town neighbourhood have been identified.

The city has worked closely with C40's African Cities for Clean Air programme. Freetown benefited from training in the use of air quality benefits tools like BenMAP and C40's Air Quality through Urban Action (AQUA) tool. In addition, Freetown's city staff attended a three day workshop delivered in Addis Ababa focussed on air quality communications. The city also worked closely with the C40 African Cities for Clean Air team on a proposal for the reduction of emissions from open burning of waste in marginalised communities. Freetown has prepared requests for technical assistance over the course of the year to continue to tackle emissions. City officials also have attended

international workshops on air quality at the University of Ghana and the Climate and Clean Air Coalition (CCAC) in Bangkok. The City of Freetown in partnership with the Ministry of Environment and Climate Change has applied to join the CCAC in order to access additional technical assistance to deliver on its commitments.

Freetown City Council has had peer-to-peer exchanges with the eThekweni Metropolitan Municipality on the application of the BenMAP tool for assessing the health impacts of air quality across the city. Freetown city officials have also benefited from online and in-person training workshops on the C40's African Cities for Clean Air communications training tool.



Yvonne Aki-Sawyer
C40 Co-Chair
Mayor of Freetown

"We need a climate resilient future, so we need to focus on ensuring that we have clean air. If you look at the context of what climate change means, its impacts and effects - when you put all of that together, you have a crisis. Addressing those challenges creates employment opportunities."

See full statement [here](#)



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JOHANNESBURG

SOUTH AFRICA

The City of Johannesburg signed the C40 Clean Air Accelerator in 2022 following the finalisation and approval of the City's Air Quality Management Plan. The city's vision is to ensure clean air for all residents of Johannesburg. The city is committed to working for a future where all people can thrive and enjoy healthier, more active lives. Johannesburg is working towards this future with the support of ambitious and innovative policies and laws, to meet World Health Organization (WHO) air quality guidelines by 2030 and achieve the goals of the Paris Agreement.

Johannesburg has a clear pollutant baseline aligned with the 2016 emission inventory and the monitoring station network deployed across the city. During the period under review, the city managed to re-commission one additional station that was not operational for some time in Davidsonville. This provided an additional monitoring point for particulate matter (PM) and ozone (O_3). The city has a total of seven operational monitoring stations which all report live data to the South African Air Quality Information System.

In addition to the reference monitoring stations, there are six lower cost monitors deployed as part of a pilot to determine operational suitability and data comparison with reference stations. The lower cost monitors provide good air quality data over this period for PM_{10} , $PM_{2.5}$, PM_1 and nitrogen dioxide (NO_2). The city participated in the World Bank funded project Pollution Management and Environmental Health for the development of a regional Air Quality Monitoring Project (AQMP) that includes the cities of Tshwane and Ekurhuleni. The Comprehensive Air Modelling with Extension (CAMX) model results from the study confirmed that $PM_{2.5}$ is still high in Johannesburg and does not meet the National Ambient Air Quality Standards, which the city is working to resolve.

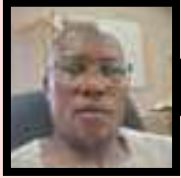
The city completed and published the 2021 Air Pollution Control by-laws to reduce emissions from specific activities including small industrial facilities, dust control, open burning, and emissions from diesel vehicles. The by-laws have now come into effect and Johannesburg has set itself a target to develop a comprehensive database for small industrial activities through the permitting system.

With the support of C40, Johannesburg received funding to conduct a feasibility study to implement a low emission zone (LEZ) in the Sandton Central Business District (CBD) and Johannesburg CBD. The project is due to be completed in the first quarter of 2024. Implementing a LEZ in these areas is designed to reduce traffic in the city, further reduce the reliance on private vehicles and promote a shift towards public transport.



Public transport network expansion plans are currently underway to ensure all communities have access to a more reliable and efficient transport system in Johannesburg, which is inclusive and caters for marginalised communities. As part of this project there is more collaboration and alignment with the transport sector, which is acknowledging its contribution to greenhouse gas (GHG) emissions and air pollution. The city is adopting an integrated approach to deal with any challenges.

Johannesburg is working to raise awareness about air quality through investing in public campaigns, such as during the week of International Day for Clean Air for blue skies. The week is considered an Air Quality Week in the city calendar, with more activation within the media and events organised to celebrate the day. The focus for this year was on the two city regions that are considered to be the most polluted in the country – Soweto and Orange Farm. The programme started with stakeholder workshops for ward committee members, to educate them about air quality and the climate crisis, and to identify local challenges that contribute to air pollution and climate impacts. These stakeholders are becoming local champions for the programme. The two workshops in the regions were delivered with the help of C40’s Climate Action Plan Implementation Programme.



Mr. Musa Mahlatji

Head: Air Quality Management, Environment and Infrastructure Services Department, City of Johannesburg. Responsible for development of air quality policy, strategy and implementation of improvement programmes.

> What is your role within the city, and what actions have you been involved in with your team that make you proud?

The City of Johannesburg, like many other metropolitan cities in the world, is facing challenges of poor air quality driven by divergent sources. In the past few years, in my role as lead for air quality management I have managed to deliver a comprehensive air quality management system that comprises an air quality monitoring network, emissions inventory, air quality modelling and air quality management plan. One of the inspiring programmes that has been undertaken by the team recently was the Air Quality and Climate Change co-benefits programme to quantify the air quality benefits accrued from implementing climate action. It is important that as we think about reduction of carbon emissions, we must ensure that the actions also have an immediate impact in poor air quality. The focus for the team is to ensure that air quality is improved to protect the health and wellbeing of Johannesburg residents and achieve local ambient air quality standards as we strive for WHO air quality guidelines.

> What are you looking forward to achieving as we move toward the 2025 accelerator targets (Before 2025 or within 5 years of joining this commitment, implement new substantive policies and programmes to address the top causes of air pollution emissions within our city and under our control)?

The city needs to adopt new quantitative emission reduction targets that commits the city to aggressively move towards compliance to local standards and *WHO air quality guidelines* by 2030. The city identified vehicle emissions as one of the major contributing factors for poor air quality. The city is committing to very ambitious programmes that will see the first implementation of the Low Emission Zone by 2030. A feasibility study is currently underway for implementation of a Low Emission Zone in Johannesburg CBD and Sandton CBD. The Low Emission Zone will put in place restrictions on certain categories of vehicles and go a long way in promoting the shift to public transport and reduce reliance on private vehicle usage.

> What inspires you in the work you do to improve air quality in your city in order to achieve the commitments of the Clean Air Accelerator?

I am inspired by the drive to realise improved air quality especially the knowledge that as we improve air quality the most vulnerable like children and the elderly will be assured of better health outcomes. In the City of Johannesburg low-income communities are mostly highly impacted by air pollution and mostly they are impacted by pollution that is generated due to limited access to clean energy and some basic services.

> What have you learned from another city official (either in your own city or another city) that has changed the way you approach your work?

The work that is undertaken by the City of London in the space of vehicle emission has been a game changer and provides a blueprint for more cities. The experience of London in this space has enabled me to be able to push the boundaries and strive for more bold actions in the quest to realise improved air quality. London's Low and Ultra Low Emission Zones have proved that innovative actions can result in quantifiable improvements. In this regard the City of Johannesburg is taking valuable lessons around effective implementation of low emissions zones and stakeholder management.

> What impact has your work had on the quality of life of your city's residents, and what does this mean to you?

The city air quality monitoring network is continuously providing state of air quality data to the residents and people can make life saving decisions on a daily basis. This is very important for me as we can make a difference daily in the lives of our people. It is heart-warming to know that this network is making a difference over and above other initiatives that we are driving as the air quality team. Such initiatives include regulation of air quality sources and air management planning.



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LAGOS

NIGERIA

Since signing the C40 Clean Air Accelerator in 2022, Lagos has received support from C40's African Cities for Clean Air technical assistance programme. This has helped Lagos develop an integrated greenhouse gas (GHG) and air quality emissions inventory, health impact analysis, and air quality monitoring support to establish citywide air quality baseline levels. Lagos has undertaken the first stages of its roadmap development to establish baseline levels and draft ambitious reduction targets consistent with achieving WHO air quality guidelines. The city also intends to improve its air quality monitoring capacity by procuring and deploying lower cost air quality monitors.

Lagos has built the capacity of stakeholders on the fundamentals of air quality inventories, giving them the opportunity to discuss data collection challenges and the way forward for the next phase of emission inventories and emissions reduction strategies. Air pollution health impact analysis is being carried out using the C40's Pathways-AQ tool to support decision making.

Through the C40 Climate Action Implementation (CAI) programme, the city and the national waste authority are collaborating to promote waste segregation from source. Improving the management of organic waste in Lagos has been selected as a priority action for technical assistance. The organic waste value chain including collection, storage, transportation, recycling, treatment and establishment of biogas and compost will contribute to reduce GHGs and air pollution from the waste sector, support the local circular economy and create good green jobs.

The city also prioritised the distribution of solar solutions for residential apartments and small and medium scale enterprises (SMEs) for the implementation of climate action in the energy sector. This will generate air pollutant emissions reduction and health co-benefits.



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NAIROBI

KENYA

Since signing the C40 Clean Air Accelerator in 2022, Nairobi has focused on implementing the priority actions laid out in the city's action plan.

Nairobi has worked to build air quality monitoring capacity, with around ten city officers now responsible for air quality knowledge dissemination.

The city entered working partnerships with strategic partners including the World Resources Institute (WRI) to establish baseline air quality Source Apportionment (SA). The city is also working with the AirQo project at Makerere University to increase the city's air quality monitors. The city has installed 17 air quality monitors to measure particulate matter (PM_{2.5}) concentration (with a baseline of 24 microns) and has made this accurate, real-time data accessible to the public. This has boosted positive public perception and raised awareness among residents.

The air quality monitoring in the City of Nairobi and the publication of its air quality regulations is also helping to strengthen the overall legal monitoring and management of air quality in Nairobi City County. The city formed and co-chairs the Nairobi Air Quality Working Group, a partnership of all stakeholders working in the air quality space including academia and scientists.

The city conducted a survey to get an understanding of Nairobi residents' knowledge of current air pollution sources, and their perception of and attitudes toward air pollution in Nairobi. This is to help achieve the following objectives:

1. To capture Nairobi residents' perception of air quality in their city and what they believe the main sources of air pollution are.
2. To guide information sources for a Clean Air Catalyst (CAC) strategy for future advocacy efforts in Nairobi.
3. To capture a baseline that would serve as comparison for measuring a shift in awareness after CAC's advocacy and campaign efforts.

Nairobi has included air quality management in the County Integrated Management Plan which is a four year programme cycle and captured in its financial cycle. In 2023 alone, the city intends to buy more air quality monitors and a reference station to scale up and intensify network and data access on air quality.

The city has also recruited and established the climate and air quality unit with a total of 12 technical staff focused on air quality and global heating work. The city has also partnered with UN Environment and Stockholm Environment Institute to access data from their air quality monitors too.

The city has hosted forums at COP27, the African Climate Change Summit, and participated in the clean air awareness week on 3 May 2023. Nairobi has also participated in international fora for example air quality training in Rwanda, Uganda and South Africa, where the city showcased its commitment to clean air.

Nairobi has also made efforts to push the dialogue on electric mobility transport models and increase green spaces in the city. It has introduced more non-motorised transport lanes which will impact positively on emission reductions, and constructed new roads with walking and cycling lanes, a model which is now being adopted across the city.



The city will complete its air quality management plan and update its air quality action plan for 2024. Nairobi will also complete its air quality regulations to strengthen the implementation of its air quality act. The city will continue tracking various emission reductions in line with the climate action plan and work with partners to establish baseline concentrations for pollutants that have not yet been incorporated.



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TSHWANE

SOUTH AFRICA

Since joining the C40 Clean Air Accelerator in 2022, the city introduced its [Air Quality By-Law of March 2022](#) and has been working to implement its measures and meet the targets of the national Air Quality Act 2004.

Tshwane is seeking funding for lower cost portable air quality monitors to expand its network of ambient air quality monitors. The city has set baseline pollutant levels as part of its Air Quality Management Plan assessment.

The city has also worked to reduce its emissions through various measures. The city has conducted an awareness-raising campaign

discouraging tyre burning. Tshwane has also approved a measure to electrify informal settlements, which will help reduce the burning of waste, as well as solid and fossil fuels for cooking and heating in informal households.

The city has conducted feasibility studies in potential areas for new recycling facilities. Tshwane's Air Quality By-Law also contains stipulations to reduce emissions from sources like veld burning. In addition, it will contribute to emissions reductions from small boilers through testing and reporting. Work has commenced to register small boilers.



SIGNATORY CITIES IN

EAST, SOUTHEAST ASIA AND OCEANIA



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JAKARTA

INDONESIA

Since September 2022, Jakarta has issued the following air quality regulations:

1. Governor's Decree on Air Pollution Control Strategy (SPPU), a strategy to improve pollution control governance and reduce air pollution emissions from mobile and immovable sources, with 16 programmes and 64 action plans.
2. Governor's Decree on the Air Pollution Control Task Force, which contains a list of jobs and description of the air pollution control task force.

Jakarta's successes in this field include:

1. The expansion of air quality monitoring using reference stations at three locations, as well as introducing 14 lower-cost monitors.
2. A newly established task force to accelerate efforts to control air pollution through strong coordination.
3. New administrative sanctions imposed against businesses and or activities generating air pollution, for example coal stockpile and steel smelting.

4. Increased emission test locations, now up to 338 workshops (for four-wheeled vehicles) and 114 workshops (for two-wheeled vehicles).
5. The expansion of parking disincentives for vehicles that have not passed the emissions test. There are ten new locations of UP Perparkiran (parking management units) and 24 PD Pasar Jaya (markets managed by the government of DKI Jakarta Province) currently integrated into the disincentive system.
6. An increased use of electric vehicles including TransJakarta Buses and operational service vehicles.
7. The implementation of fines for vehicles failing the emissions test (planned for November 2023) operation of watermist in high-rise buildings in Jakarta, especially when pollutant concentrations are high in certain months during the dry season (135 watermist units in 121 buildings).

In 2024, Jakarta will increase its air quality monitoring system with the addition of nine air quality lower cost monitors and four reference monitoring stations.



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QUEZON CITY

PHILIPPINES

Since 2019, Quezon City has demonstrated its strong commitment to better air quality, environmental sustainability and mitigating climate breakdown.

Progressing from the development of the Air Quality Management Plan Roadmap under the C40 Air Quality Technical Assistance Programme last 2021, the city has recently completed its Air Quality Management Plan (AQMP) with the support of Clean Air Asia. This provides a long-term programme for the attainment of the city's clean air objectives, and focuses on the following areas:

1. Expansion of the air quality monitoring network.
2. Emissions Inventory (EI) to identify various sources of emissions and hotspots in the city, as well as an in-depth analysis using the Low Emissions Analysis Platform- Integrated Benefits Calculator (LEAP-IBC). This is a data-driven process to prioritise emission reduction measures in consideration of air quality, climate, health, and economic benefits.
3. Communication planning for air quality management awareness.

4. Introduction of two Air Quality Management Plan pilot projects, one to transition the government fleet to electric vehicles, and a bike-to-school programme to improve cycling infrastructure in and around schools, provide bikes for students and training on biking and safety measures.
5. The plan also provides a comprehensive, integrated, and interactive planning process across various stakeholders including inputs from the city's Air Quality Technical Working Group, civil society organisations and the barangays.

Quezon City is committed to meeting the World Health Organization (WHO) air quality guidelines by 2030 and has also set reduction targets per type of pollutant by 2030, 2040 and 2050.

To date, Quezon City has 20 non-reference air quality monitors, one reference station and six automated weather stations strategically located across the city. This will be further expanded with the deployment of 20 additional non-reference air quality monitors and one automated weather station, totalling 41 monitored locations at the end of 2023.



City officials from the Quezon City Climate Change and Environmental Sustainability Department (CCESD) underwent in-depth training and data management sessions which helped strengthen the city's technical capacity, particularly on data acquisition, analysis and interpretation of air quality data and information.

To scale-up its mitigation initiatives, the city is also pursuing sustainable transport and active mobility by promoting the use of hybrid and electric vehicles while also providing the necessary infrastructure to encourage cycling and walking. The green fleet transition programme is already underway, starting with the procurement of hybrid vehicles for city use under a fleet management system. The city is also looking into the use of electric buses for the Quezon City Bus Augmentation Programme, which is a free bus ride service provided to residents. Currently, there are eight interconnected routes with more than 100 buses.

For active mobility, about 125 kilometres of bike lanes across the city have already been created, which is around 35% of the total target of 350 kilometres by 2030. The city is also developing green pedestrian corridors through the Green Open Reclaimed Access Lane Project or GORA Lane. Two of these corridors have already been completed. The city has also partnered with the Institute for Climate and Sustainable Cities (ICSC) and ICLEI - Local Governments for Sustainability to implement the Sparking Active Mobility Actions for Climate Friendly Cities or 'Spark Project' in order to improve and promote active transportation, support emission reduction activities, and develop a secure and accessible transportation system within the city.

On energy efficiency and renewable energy, the target is to install solar photovoltaic systems in all feasible city-owned buildings and facilities. Lighting systems are also being converted into LEDs as part of the national government's energy management programme. Quezon City's Green Building Code is also being amended to raise minimum energy efficiency requirements for buildings. The target is to have 80% to 100% fully compliant buildings to the Green Building Code by 2030.

Biodiversity management and other nature-based solutions are also integral to Quezon City's overall sustainability goals. The target is to double the number of parks in the city from 226 to almost 500 parks by 2030. The Quezon City Urban Biodiversity Sustainability Action Plan is also being developed to assess the biological health of the urban ecosystem and identify measures on how to protect and enhance areas of conservation and protection.



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SEOUL

SOUTH KOREA

South Korea's national government announced its commitment to curb annual average particulate matter (PM_{2.5}) levels by over 35% from 2016 levels by 2020. Following this, Seoul set its own target to reduce PM_{2.5} levels in the city by 35% from 26 µg/m³ in 2016 to 17 µg/m³ by 2024, which is included in its Air Quality Control Action Plan (2020–24). In 2024, Seoul will develop their third Air Quality Control Action Plan (2025–29).

There are now 64 projects in development across the city as part of the action plan, in four areas of emissions reduction – public health protection, domestic and overseas cooperation and public engagement. PM_{2.5} levels in 2021 hit a record low at 20 µg/m³, down from 25 µg/m³ in 2019. Seoul's approach to reduce exposure to air pollution takes into account the city's most marginalised populations; air quality monitoring data is used to alert of extremely poor air quality and help reduce children's exposure in nurseries, as well as other vulnerable groups through information shared via texts and TVs.

In 2024, Seoul intends to shift diesel street cleaning vehicles to compressed natural gas (CNG) and electric vehicles (EVs). The city will electrify small-sized city buses, along with cargo trucks and motorcycles.

The city will also encourage early scrapping of Grade-4 vehicles and expand the driving ban in the Green Transport Zone and the LEZ, which affects the entire city boundary to include Grade-4 vehicles.

Seoul will also keep deploying domestic low-nitrogen oxides (NO_x) boilers and install air pollution monitoring systems at construction sites, factories and facilities that generate high air pollution.

Construction sites will also experience cleaner air thanks to measures being introduced by Seoul. The city is providing support to retrofit old construction machines, as well as introducing restrictions on the use of old machines at municipal construction sites. Seoul has introduced a requirement for the use of low-emission construction machines at large facilities with an area of over 100,000 square metres, subject to the Environmental Impact Assessment.



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SYDNEY

AUSTRALIA

Since the last reporting period, the City of Sydney has concluded its local air quality monitoring pilot programme. This is due to a combination of no apparent air quality issues being detected, and intermittent reliability of the devices used.

The New South Wales (NSW) State Government continues to operate two regulatory grade air quality monitoring stations in Sydney that consistently report air quality as 'good' - the best rating.

The city has also received mobile air quality data collected by Google as part of its street mapping project and is currently assessing whether there are indications of air pollution hotspots that may warrant further investigation in locations where at least 8 readings were taken.

The City of Sydney continues to encourage active transport as the first mobility option via physical infrastructure like footpath widening, cycle ways, and pedestrianising roadways, as well as by running behaviour change programmes.

In July 2023, the city published its strategy and action plan to electrify transport in Sydney. The city's main transport advocacy priorities are to call for the NSW government to electrify buses on high density routes through Sydney, and for the Australian national government to introduce stringent vehicle fuel efficiency standards for new vehicles.

The City's Greening Sydney Strategy also outlines the important role for urban trees and greening to adapt to the impacts of the climate crisis and air pollution.

Sydney will continue to improve air quality and access to information by:

- Continuing to work with the NSW government to find a suitable location for a third regulatory grade air quality monitoring station in the Local Government Area (LGA).
- Annually reporting air quality information from NSW government air quality stations located in the LGA as part of the city's community strategic plan reporting.
- Continuing to implement urban greening and cleaner transport strategies and programmes as ways to improve local air quality.



TOKYO

JAPAN

Since signing the C40 Clean Air Accelerator in 2019, Tokyo has been working ambitiously to achieve its air quality commitments.

The Tokyo Metropolitan Government achieved the national environmental standards for particulate matter (PM_{2.5}) in 2019, and, in an effort to make further improvements, has set a goal of reducing the average value at all measurement stations to 10 µg/m³ or less by 2030. Tokyo achieved this goal for the first time in 2021, setting a new target of an annual average value of 10 µg/m³ or less at each measurement station.

To achieve this new goal, Tokyo will continue to expand and implement the measures it has been taking so far.

The Tokyo Metropolitan Government is working to reduce PM_{2.5}, for which a new target has been set, and ozone, for which the national environmental standard has not yet been achieved, through the following efforts to reduce volatile organic compounds (VOCs) and nitrogen oxides (NO_x):

- Measures to expand and encourage the use of non-gasoline vehicles.
- Promotion of voluntary efforts by businesses and individuals through the 'Atmospheric Environment Improvement Promotion Project for the Realisation of Clear Skies', and public awareness raising efforts aimed at improving the atmospheric environment.
- Promotion of the conversion of atmospheric environmental data into open data in order to link to air pollution countermeasures using the latest technologies such as 5G.
- Cooperation with neighbouring prefectures and cities to promote wide-area air pollution countermeasures.
- Understanding the sources of volatile organic compounds that contribute significantly to ozone production.



SIGNATORY CITIES IN

EUROPE



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BARCELONA

SPAIN

Since September 2022, the City of Barcelona and the Barcelona Public Health Agency has expanded its air quality monitoring network by adding four portable nitrogen dioxide (NO₂) and particulate matter (PM₁₀) measuring devices and will continue to add more reliable and accurate air quality monitors to its network. The portability of this equipment makes it possible to gather data in specific areas where it is not otherwise possible to link to the official network or even connect a mobile unit. There are a total of ten monitoring stations across the city.

Barcelona has established baseline pollutant levels and drafted ambitious reduction targets consistent with achieving EU limit values, especially for NO₂. The city will set additional reduction targets based on the interim targets in the WHO air quality guidelines. There will be a particular focus on tackling pollutants that are more challenging to reduce, such as PM_{2.5}. The first and most important step for the city will be to ensure NO₂ levels are within the EU approved limit.

In January 2023 Barcelona introduced its new low emission zone (LEZ), meeting the air pollution and global heating requirements of the National Spanish Climate Change and Energy Transition Law. According to this law, all Spanish municipalities with more than 50,000 inhabitants must establish a LEZ by the end of 2023.

Barcelona's new Urban Mobility Plan sets ambitious targets to reduce transport related air pollutants. Between 2019 and 2022 the City of Barcelona built 1,154 km of cycle lanes, increasing the total length of cycle lanes by 31%. Between 2021 and 2023, Barcelona has built 32 km more cycle lanes to make it safe and accessible for people to make journeys by bike.



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BERLIN

GERMANY

Berlin is committed to create an air quality strategy that meets the 2005 World Health Organization (WHO) air quality guidelines, as part of the city's second update to its Clean Air Plan (2019). Berlin intends to launch a broader participatory process in 2024 that involves key stakeholders and interested sections of civil society in the development of air quality improvement measures.

Berlin hosted the 2023 C40 Air Quality Network Workshop and highlighted the importance of low and zero-emission zones. Berlin's Zero Emission Zone is included in two key plans of the State of Berlin – the Urban Development Plan for Mobility and Transport and the Berlin Energy and Climate Protection Programme 2030 (implementation period 2022–26).

The Berlin Senate is working to electrify the city's vehicle fleet with a consultation process to assess the social, economic and climatic effects of the measure. The city is making ambitious progress in converting the city bus fleet to electric buses. The EU Clean Vehicle Directive quota for vehicle procurement will be 65% for clean and zero-emission vehicles from 2026. Berlin is already procuring all-electric vehicles well ahead of the acceleration target.

Berlin continues to build on its ambitious walking and cycling strategy to increase the number of cycle lanes across the city. In 2021 and 2022 the city deployed 65.5 km of new cycle lanes.

Berlin's public transport measures focus on densifying and expanding the network, timetables and capacity. In addition, public transport services in less developed areas of the city will be supplemented by the Berliner Verkehrsbetriebe (BVG) Muva on-demand service and an on-call bus concept.

To further encourage a switch to public transport, Berlin's Clean Air Plan has expanded the city's parking management system by around 10 km² in nine new zones since 2022. The city administration has also increased parking fees by €1 (US\$ 1.1) per hour on average. Berlin has mapped all public parking spaces in the inner city area (90 km²) to help sustainable transport planning and development.

The new Berlin Mobility Act regulates emission-relevant modes of transport and creates a uniform framework for car sharing to help strengthen and encourage the use of public transport, walking and cycling.

By 2027, Berlin will have a network of around 850 km of high quality main cycle routes. Berlin aims to reduce the share of car traffic in the modal split from 26% today to 18% in 2030, which will significantly improve air quality and contribute to the city's climate protection goals.



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COPENHAGEN

DENMARK

Since the last reporting period, Copenhagen has introduced stricter legislation to the city's low emission zone. This means municipalities can extend the particle filter requirement for vehicles to also apply to older diesel passenger cars in certain areas of the city. The new requirements were implemented on 1 October 2023.

The city council is waiting for the government to reintroduce its proposal regarding zero emission areas (ZEAs). There is currently no indication as to when this might happen.

National legislation allowing municipalities to restrict older wood stoves was also adopted in 2022 and formally announced in July 2023. It is expected that the city council will vote on this in the first quarter of 2024.



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HEIDELBERG

GERMANY

The air quality in Heidelberg has improved significantly since the city introduced its low emission Environmental Zone in 2013. The city has complied with the national nitrogen dioxide (NO₂) limit since 2017. In 2021, the NO₂ value at Mittermaier Straße was 27 µg/m³ and in 2022 at Berliner Straße it was 14 µg/m³.

The Heidelberg Environmental Zone was rolled back by the Karlsruhe regional council on 1 March 2023, in accordance with an update to the air pollution control plan for the Karlsruhe administrative district. Data analysis shows that pollutant limits will not be exceeded even after the Environmental Zone has been completely abolished.

The city will introduce further measures to reduce emissions through its sustainable mobility funding programme, including expanding cycling.

On 20 July 2022, the City Council of Heidelberg adopted the following new climate neutrality targets:

1. Heidelberg is committed to work towards climate neutrality by 2030 in all areas of action and to prioritise climate protection in line with its participation in the EU Climate Neutral and Smart Cities mission.

2. The city will achieve complete climate neutrality by 2040 at the latest, according to the municipal BSKO (Municipal Accounting System).
3. Heidelberg is developing a new climate protection plan with new additional quantified measures by sector and interim targets up to 2030.

So far the city has been working to achieve targets set out in its 100% Climate Protection Master Plan and Climate Action Plan. Going forward, the Climate Mobility Plan will be based on the target of climate neutrality in line with the resolution of 20 July 2022.

The Climate Mobility Plan will be combined with Heidelberg's urban development concept and the climate neutrality targets. In addition, immediate measures will be defined in scenarios with high climate impact. The project is expected to be completed and approved by Heidelberg City Council in the first quarter of 2024.



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LISBON

PORTUGAL

Results collected at various stations of the Lisbon Air Quality Monitoring Network in 2022 reflect a full return to pre-COVID-19 levels of activity, after two years marked by restrictions in economic activity and by isolation measures. In 2023, the city recorded an increase in concentrations of various pollutants, whose main source is road traffic. Lisbon's air quality was still considered to be good and had improved since 2019, the year before the pandemic.

Nitrogen Dioxide (NO₂) concentrations recorded in some monitoring stations slightly increased in 2023 compared to 2020 and 2021 but are still significantly lower than those observed in pre-pandemic years.

NO₂ levels in the Avenida da Liberdade were again recorded to be above the annual limit in 2022.

This is due to the gradual return of economic activity, particularly in the tourism, commerce and services sectors, and with increased road traffic circulating in Lisbon's central zone to levels close to those recorded in 2019.

Over the next few years, Lisbon's focus will be on reducing NO₂ levels in the city by reducing traffic circulating in the city. Lisbon's 'There is Life in My Neighbourhood' (Há Vida no meu Bairro) programme seeks to develop a set of interventions in public space to encourage journeys on foot and prioritise pedestrians. Lisbon will introduce 15-minute city measures to ensure that essential services such as shops, pharmacies, schools and parks are all within easy walking or cycling distance for residents. This will help Lisbon become a more people-centred city that is sustainable, equitable and liveable.



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LONDON

UNITED KINGDOM

London has made strides in its commitment to improve air quality and achieve net zero by 2030. C40 Co-Chair and Mayor of London Sadiq Khan expanded London's Ultra Low Emission Zone (ULEZ) on 29 August 2023 to cover the whole Greater London area, helping the capital's nine million residents to breathe cleaner air.

The London-wide ULEZ has already been highly effective at reducing the number of older, more polluting vehicles in London: 95 per cent of vehicles seen driving in London on an average day now meet the ULEZ emission standards, up from just 39 per cent in 2017. The expansion of the ULEZ, believed to now make London the world's largest clean air zone of its kind, is projected to clean up London's air by cutting road traffic nitrogen oxides (NO_x) emissions by 362 tonnes across Greater London in 2023 alone. This is on top of the air quality improvements Londoners are already experiencing from the central and inner London ULEZ and those expected in the long term. The policy has already contributed to a 46% reduction in harmful

nitrogen dioxide (NO₂) concentrations alongside roads in central London and a 21% reduction in inner London compared to what they would have been without the scheme.

The ULEZ is the centrepiece of a range of measures Mayor Khan is implementing to tackle London's toxic air, including putting a record number of zero emission buses on the roads and supporting the delivery of more than 18,000 electric vehicle charge points, over one-third of the UK's total. As part of these efforts, the capital's Breathe London air quality monitoring network has expanded exponentially, growing from 300 monitors to almost 450 citywide. Among these, Mayor Khan funded the installation of 136 monitors at priority locations such as schools and hospitals. The data collected by this network has been made publicly accessible through the Breathe London website and an Application Programming Interface (API) has been built to facilitate direct data access for developers.



Sadiq Khan
C40 Co-Chair
Mayor of London

“We are facing a pivotal moment in our efforts to tackle the triple dangers of toxic air pollution, climate change and congestion.

We simply don't have time to waste – deadly air pollution is permanently damaging the lungs of young children and affecting older people who are more vulnerable to the impacts of poor air quality.

This is also about social justice – we know pollution hits the poorest and most vulnerable the hardest, which is why I'm working with C40 doing everything I can to improve air quality and protect the health of our residents.”

The Breathe London Communities programme has also reached a pivotal milestone, having completed its third and final round of engagement. A total of 60 community groups have been provided with fully funded sensor nodes, empowering them to monitor and take action to improve their local air quality. The Breathe London website has also been updated to showcase inspiring stories about these communities.

Furthermore, London is working to safeguard public health by aligning its air quality targets with the 2021 air quality guidelines recommended by the World Health Organization (WHO). A scientific and technical assessment is currently underway to identify the necessary measures to reduce air pollutant emissions and ambient concentrations to reach the WHO air quality guidelines.



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MADRID

SPAIN

Since September 2022, the City of Madrid has continued implementing the Madrid 360 Sustainability Strategy to improve air quality, as well as mitigate and adapt to the climate crisis. These complement the actions being implemented as part of the Madrid Recovery, Transformation and Resilience Plan (2021).

The Madrid 360 strategy develops a series of actions to prioritise active modes of mobility such as cycling and walking, as well as a commitment to public transport, shared mobility and the renewal of the vehicle fleet towards less polluting fuels and technologies. In addition, Madrid City Council is working with other administrations to implement structural measures including low emission zones, park-and-ride, parking policies to minimise unnecessary trips, and lanes for High-Occupancy Vehicles (BUS-HOV lanes).

Since September 2022, the public access rapid charging network has been expanded, along with an increase in the number of charging points in municipal facilities for the city council's vehicle fleet. The pedestrianisation of Puerta del

Sol has been completed. Diesel vehicles have been eliminated from the municipal transport company's bus fleet and 180 electric buses are now available. BiciMad, the public bicycle rental service, has been expanded across the entire city to include 611 stations and 7,500 bicycles. The Regulated Parking Service (SER) has also been expanded and the renewal of the taxi and bus fleet with electric vehicles has continued.

The next steps of Madrid's M360 strategy are to:

- Complete the Castellana cycle lane
- Continue the Cambia 360 Plan
- Create a new Bus-HOV lane on the A2
- Create a housing renovation plan to increase energy efficiency
- Increase the number of charging points for electric vehicles throughout the municipality
- Continued conservation of the Metropolitan Forest
- Roll out ISO 50001 energy certification in municipal buildings



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MILAN

ITALY

Milan's Air Quality and Climate Action Plan, approved by the City Council in February 2022, has three objectives:

1. Abide by EU limit values for atmospheric pollutants (PM_{10} and NO_x) to protect public health.
2. Reduce carbon dioxide (CO_2) emissions by 45% by 2030 and achieve carbon neutrality by 2050.
3. Limit local temperature increase to within $2^\circ C$ by 2050, by means of urban cooling and reduction of heat islands.

The plan brings together pre-existing strategies in Milan such as the Urban Sustainable Mobility Plan, the Action Plan for Sustainable Energy, the Urban Traffic General Plan, the Timetable Territorial Plan, and the Stakeholders Engagement Strategy.

Milan has also concluded the development phase of the monitoring aspect of its Air Quality and Climate Action Plan. Approved in October 2022,

this involves the identification of new indicators, particularly socioeconomic impacts and the impacts generated from all adaptation actions. The municipality is engaging with frontline communities most impacted by the climate crisis to design and implement climate solutions that address their needs.

A set of five monitoring stations (near-reference air quality monitoring compact stations) will assess the impact of local policies at microscale level and will measure particulate matter (PM_{10} , $PM_{2.5}$), nitrogen dioxide (NO_2), nitric oxide (NO), ozone (O_3), carbon monoxide (CO), carbon dioxide (CO_2), black carbon and volatile organic compounds (VOC). Some will be used semi-permanently in sites of special interest, while others will be rotated for specific studies and assessments, including near schools, youth centres and nursing homes or hospitals. This will help support municipal policy planning, and help identify priority areas to introduce clean air measures to reduce residents' and city users' exposure to air pollution.

Milan has taken action to tackle transport related air pollution. Measures include:

- Milan has concluded its first pilot project on Via Sacchini as part of the of the Piazze Aperte (Open Squares) programme and monitored pollutant levels before and after the intervention. The city is also prioritising the Open Squares for Every School call to increase public space and public areas in order to reduce air pollutant exposure.
- Between 2019 and 2020, Milan pedestrianised ten areas of the city after measuring the air quality benefits during the pilots.
- Milan's public transport company ATM is no longer purchasing purely internal combustion engine buses as of 2021. This will allow the entire fleet to run fully carbon free by 2030.
- The city has approved measures expanding and strengthening Zero Emissions Areas in Milan, including the creation of pedestrian areas and limited traffic zones as well as reduction of on-street parking spaces.
- Milan is encouraging walking, cycling and the use of public transport by accelerating the transition to sharing mobility and zero-emission transportation. New bike lanes cover over 312 kilometres of the city as of 2022.
- In November 2022, the first section of the new metro line M4 was opened, connecting Linate Airport to San Cristoforo Station. This passes through the city centre for a total length of 15 kilometres.
- The Agency for Mobility, Environment and Territory (AMAT), in collaboration with the Municipality of Milan and with the support of C40 Cities and the INGKA Group (IKEA Retail), undertook a two-year project to gather knowledge and assist local decision-makers in understanding the dynamics of urban goods distribution to advance zero emission freight.
- The city has implemented a plan to develop an urban electric charging network for both public and private use to help encourage the use of electric vehicles.

Milan has the following key activities planned in 2024:

- The city will continue to tighten the rules to limit most polluting vehicles in Area C and Area B. Diesel vehicles will be completely banned by 2030.
- Two additional stops of the new metro line M4 have been recently financed.
- The city is updating air quality regulations of activities with high emissions of pollutants other than vehicular traffic.
- Various data driven residents' science initiatives are spreading in the city. By validating these, Milan will set benchmarks and use residents' data as hyperlocal sources of information all around the city. And will create a data collection and validation platform as well as implement an air quality modelling system.

Milan's air quality team

Environment department, Mobility department and AMAT (Municipal Agency for Mobility, Environment and Urban Planning)

"Clean air is a key goal of Milan's environmental transition. The city's geographical position and meteorological conditions exacerbate pollution concentration, thus making air quality a priority issue. That is the reason why we chose to develop not simply a climate action plan, but an "Air Quality and Climate Plan", aiming to create a healthier and more inclusive city.

This requires tackling air pollution through different complementary actions, such as strengthening air quality monitoring, restricting the circulation of polluting vehicles and protecting the most vulnerable population from exposure to pollutants. The complexity of this approach is reflected in the composition of our team, which involves technical experts from the Environment department, the Mobility department and AMAT, the municipal agency specialized in those subjects."



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OSLO

NORWAY

To reduce noise and air pollution, the City Government will use a toll ring to motivate a shift towards emission free transport and implement more effective measures to reduce particulate matter. The city is working comprehensively to reduce air pollution, however there were still levels of particulate matter (PM₁₀) above the Norwegian limit values at some sites in 2022.

In 2024, Oslo will start to work on a revised Air Quality Action Plan for the city, to build on the actions the city is already implementing in order to reduce air pollution levels.

Oslo is on track for a zero-emissions public transport network. In April 2023, Oslo's public transit operator received 183 articulated electric

buses. The electric buses will serve the most heavily travelled routes in the Oslo area and provide transportation for over 150,000 residents daily. And 137 more electric buses are planned to be delivered before the end of 2023. Mostly all of the city buses will be zero emissions by the end of 2024.

In addition, the electric charging infrastructure in Oslo continues to be expanded with almost 800 charging stations for electric cars in Oslo Kommune.

The city also continues to expand cycling and walking infrastructure in the city and requires fossil-free construction sites across Oslo.



PARIS

FRANCE

Paris has achieved a continued downward trend in chronic pollution levels thanks to actions implemented by the city to tackle emissions, resulting in reduced road traffic and less polluting vehicles. In Paris, pollutant exposure has reduced significantly in recent years. Around 10,000 Paris residents were affected by excessive levels of nitrogen dioxide (NO₂) in 2022, compared to 20,000 in 2021, and 250,000 in 2019. However, NO₂ concentrations remain problematic in Paris, and regularly exceed the annual limit value and World Health Organization (WHO) air quality guidelines. Particulate matter (PM) levels decrease year after year but to a lesser extent. All Parisians are exposed to PM_{2.5} levels above WHO air quality guidelines.

Paris is implementing emissions reduction actions to continue improving air quality in the city. There are now over 2,000 charging stations in the city's electric vehicle (EV) charging network, which is helping to encourage the uptake of cleaner vehicles. The city introduced the Central Paris low emission zone in 2015, banning Unclassified, Crit'Air 5 and Crit'Air 4 vehicles from entering the zone. The current plan to increase limits to include Crit'Air 3 will come into place on 1 January 2025.

Paris' 'school streets' programme to pedestrianise streets in the vicinity of schools continues to expand across the city. As of 2023,

there are 180 'school streets' benefiting 230 schools in Paris. The aim is to make the journey between home and school safer for children by calming traffic, but also to combat air and noise pollution by eliminating or limiting car use where possible, or by lowering their speed to 20 kph in calmed zones.

The city has implemented 21% of the Paris Plan Velo and has 55 kilometres of cycling lanes planned for the 2024 Olympics. This has already made an impact on the uptake of active travel. The use of the capital's bicycle facilities jumped by over 37.3% in the first quarter of 2023 compared to 2022, according to figures from the Observatoire Parisien des Mobilités. Cycling is hugely popular in Paris, with 7% of journeys made by bike, compared with less than 5% of journeys before the COVID-19 pandemic and restrictions. There has been a 71.6% increase in the use of cycle paths between 2021 and 2023.

Paris is also working to electrify waste collection with the introduction of 18 electric refuse vehicles. Servicing vehicle fleets and heavy duty vehicles represent less than 5% of the vehicle fleet but produce between 40–60% of road traffic particulate matter and nitrogen oxides (NO_x) emissions. Through this procurement, 21 tonnes of CO₂ emissions will be avoided every week in Paris.



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ROTTERDAM

THE NETHERLANDS

Rotterdam has introduced measures to reduce transport-related emissions across the city since the last reporting period. In January 2023, the city council voted to halve the number of lanes on the Maastunnel corridor to make room for quick public transport and reduce traffic flow through the middle of the city. Rotterdam is also introducing a zero emission zone that will apply in the city centre from 2025.

New rules for trucks and coaches came into place on 1 January 2022 for the environmental zone (low emission zone). Only diesel trucks and coaches with Euro 6 emissions standard are allowed to drive into the zone, which covers the City of Rotterdam and the Maasvlakte area of the Port of Rotterdam.

To support the transition to electric driving, more than 3,400 charging stations have now been installed in Rotterdam.

Rotterdam has also introduced a new cycling network consisting of four different levels – regional, urban, fine-grained neighbourhood and recreational. The city has continued to improve cycling infrastructure over the past year by improving and widening cycle lanes, as well as creating new ones. Rotterdam has also built new bicycle sheds and parking facilities across the city, with more than 6,500 new parking spaces for bikes across the city since 2020.

In the coming years, the city will introduce five to seven new bike parking garages. In addition to investments in city infrastructure Rotterdam has also helped residents on low incomes to access bikes and provided cycling lessons for Rotterdam residents of all ages at community centres and schools.



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STOCKHOLM

SWEDEN

Stockholm continues to work to reduce emissions through targeted climate and air quality action. In 2023, Stockholm City Council developed a clean air zone plan for the city and announced it will be implemented in an area of the city centre from 31 December 2024. The zone, named 'environmental zone class 3', will be introduced in an area within the streets of Kungsgatan, Birger Jarlsgatan, Hamngatan and Sveavägen. The entrance and exit of the Klara Tunnel at Mäster Samuelsgatan will also be part of the zone, which covers approximately 180,000 square metres.

Stockholm's clean air zone will only permit the use of electric cars and cars that meet the Euro 6 emission standards. Euro 6 plug-in hybrid heavy vehicles will also be permitted. The zone will be in effect 24 hours a day, seven days a week.

Stockholm county also published an [action programme for nitrogen dioxide and particles](#) in April 2023 to tackle high levels of nitrogen dioxide (NO₂) and particulate matter (PM₁₀)

along busy streets and roads. The programme is under review and is expected to enter into force by the beginning of 2024.

Another action the city has been delivering to reduce emissions from transportation includes the support of vehicle fleet electrification, with the provision of public charging points. Stockholm currently has over 6,000 public charging points. The city also strives to get more people to cycle through the implementation of the [city's bicycle plan](#). The cycle plan focuses on six orientations for the city's cycle planning. Together, they will contribute to achieving the overall goal that it will be easier and safer to cycle in Stockholm and that the number of cyclists will increase.

The city's long-term goal is to meet the World Health Organization (WHO) air quality guidelines. In 2023, analyses were made to investigate which additional measures need to be introduced to further reduce air pollution levels.



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TEL AVIV - YAFO

ISRAEL

Since September 2022, Tel Aviv-Yafo has made significant progress in improving air quality, implementing a variety of measures to reduce emissions from vehicles, industry, and other sources. Tel Aviv-Yafo is developing an initiative to use digital enforcement to identify the most polluting heavy diesel vehicles driving into the city. This 'clean air city' project is in the final stages of approval with the Ministry of Environment and Ministry of Transportation.

In quarter three of 2023, the initial version of the transportation plan for Tel Aviv-Yafo's southern region and central station area was unveiled to the public. This plan carries ambitious objectives, primarily focused on enhancing air quality within the vicinity. The Israeli Ministry of Transportation has officially endorsed this plan, outlining its determined targets for the electrification of the local bus fleets.

A total of 50 lower cost monitors are also being implemented throughout the city to help monitor air quality.

In August 2023, the light rail connecting Tel Aviv-Yafo to four other cities began operating. The light rail provides a new transportation option within and outside the city, helping to reduce the number of private cars entering the city.

In 2020, Tel Aviv-Yafo also established a new strategic project to promote sustainable mobility 'Turning the pyramid upside down'. The municipality's vision for sustainable transportation sees the ability to move around the city as something that should be available to all residents, rather than as a result of owning a private vehicle. This strategy aims to reduce the mode shares of private cars from 56% in 2019 to 30% by 2030.

At this stage, the city is still working to implement the goals by:

- Removing car parking spaces from sidewalks
- Increasing parking fees for visitors
- Planting more than 12,000 trees over the past year, and introducing shading along the main walkways
- Improving pedestrian infrastructure for creating a more walkable city
- Improving traffic light times for the benefit of pedestrians and creating continuous crossing
- Banning access to more streets for unsustainable transportation modes
- Undergoing major infrastructure works, including more light-rail construction, urban renewal and bike lane expansion



WARSAW

POLAND

Warsaw has continued its ambitious work to reduce emissions and air pollutants in the city. It is tackling transport emission sources by expanding its metro and tram networks. The city is gradually replacing its public transport fleet with cleaner vehicles and prioritising active transport with the creation of new cycling routes.

Warsaw is also working to create a clean transport zone in 2024, Strefy Czystego Transportu (SCT), which will limit the entry of the most polluting vehicles into the city. This is after a recent statutory change which has given local governments in Poland the power to implement Clean Transport Zones in order to reduce transport-related air pollution. Residents have had access to the preliminary design of the zone through public consultations. The city has support from residents for this type of action as demonstrated by a Clean Air Fund study, which found that half of Warsaw's residents believe air quality is poor in summer. The study also found that 66% of residents would like to create a clean transport zone in their city, and almost half of the respondents point to cars as the main source of pollution in the capital.

By the end of 2024, the city plans to expand the metro by 45.4 km. So far, additional sections of Warsaw's second metro line have been opened in the Wola, Bemowo, and Targówek districts. Above-ground transportation has been improved to quickly and frequently connect to the new underground stations. New solutions have been implemented in the southern and eastern districts of Warsaw. New tram connections to Wilanów and Ursynów are being constructed, as well as to the Ursynów section of the Southern Warsaw Ring Road. New bus connections have been launched. Additionally, a concept has been developed in the city for the expansion of the fifth metro line and new tram routes that will connect all 18 districts of the capital by 2050.

Warsaw has also implemented policies this year to continue to tackle emissions from the building sector. From 1 January 2023, a ban on using non-class coal and wood boilers in Warsaw entered into force and since 1 October 2023 there has been a ban on burning coal in households. Since 2017, Warsaw has provided subsidies to residents from the city's budget to replace heating systems using solid fuels for cleaner heating options, including renewable energy sources, the district heating network, gas boilers or heat sources powered by electricity. Residents modernising their building's heating system as part of the subsidy often integrate it with renewable energy sources such as photovoltaic solar panel installation.

The subsidy programme excludes subsidies for installing solid fuel boilers according to EU directives. Since 2017, thanks to the capital's financial support, the number of solid fuel heat sources in the private stock has been reduced by nearly 3,900 (around 500 in 2023), spending more than PLN 80.7 million (US\$ 20.2 million).

At the same time, almost 1,800 solid fuel boilers in the municipal stock have also been removed in recent years, including around 150 in 2023. In addition, residents who heat their properties in an environmentally friendly manner (not using solid fuel or fuel oil) can apply for subsidies for renewable energy source (RES) installations such as heat pumps, solar collectors, photovoltaic panels or wind turbines. Since 2017, the city has provided nearly 5,000 grants for more than PLN 55.5 million (US\$ 13.9 million) to install RES installations. The city will continue its subsidy programme for residents to reduce carbon dioxide (CO₂) emissions and improve air quality.



SIGNATORY CITIES IN

LATIN AMERICA



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BOGOTÁ

COLOMBIA

Bogotá has made significant progress towards better air quality as part of its commitment to C40's Clean Air Accelerator.

The Bogotá Air Quality Monitoring Network (Red de Monitoreo de Calidad del Aire de Bogotá - RMCAB) has received accreditation to continue measuring the city's air quality and pollutants including particulate matter (PM_{10} , $PM_{2.5}$), ozone (O_3), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), and carbon monoxide (CO). The RMCAB has been officially audited and approved, and all Bogotá's air quality reports have been published. These include measurements of black carbon (BC). Nineteen air quality monitoring stations have operated continuously since 30 September 2023.

As part of Bogotá's 2030 Comprehensive Air Quality Management Plan the city is targeting the intermediate objective 3 of the WHO. This was laid out in the District Development Plan 'A new social and environmental contract for the Bogotá of the 21st century'.

Bogotá has also introduced new regulations for the constitution, administration and operation of its vehicle fleet with special focus on cargo transportation service. The city has made progress in creating sustainable driving guides

and good practice guides for sustainable driving training.

The Local Mayor's Office of Ciudad Bolívar (Bogotá's 19th locality) and the District Environment Secretariat (Secretaría Distrital de Ambiente - SDA) joined forces to pave fifteen roads in the town as part of the Intervention Plan for the South Western Zone (PIZSO). This intervention has generated a $PM_{2.5}$ reduction in near areas.

Bogotá has also introduced a resolution to categorise land mobile road sources and zero-emission vehicles according to their environmental impact on air quality and greenhouse gas (GHG) emissions through the Environmental Vehicle Labeling (EVA).

Bogotá has also introduced Urban Zones for Better Air (ZUMA) to improve air quality, reduce emissions of atmospheric pollutants and reduce the risk of impacts on the health of people, particularly vulnerable populations. The first ZUMA is being implemented in the Zone of Bosa. It is estimated that it will benefit more than 35,000 residents, of which 26.7% are children under 10 years and adults over 60 years, who are more vulnerable to the impacts of poor air quality.



Martha Deyanira Garcia González

Technical and Cooperation Lead, District Environment Secretariat, Municipality of Bogotá

> What is your role in the city and which activities are you and your team proud of?

In my work with the District Secretary of the Environment, I provide technical support for the fulfilment of public policies and cooperation projects in the Sub-Directorate of Air, Auditory and Visual Quality. All the management with international cooperants has allowed the staff of the area to have the opportunity to interact with experts from other countries, without leaving the cities: enriching not only their technical capacity, but today they are more motivated professionals, more convinced of their ability to be generators of change in the city.

> What inspires you about your work improving air quality in your city and working to achieve the C40 Clean Air Accelerator commitments?

A resident committed to the quality of the city they can build. For me as a public servant, convinced of the power that people have to create build, being able to influence a resident who is always a city builder, who decides to build differently, in a way that is coherent with the city they want to enjoy, is a big step forward towards better air quality and a better environment in general in the city. Change in the city is achieved through the transformation of people.

> What impact has your work had on the quality of life of people in your city, and what does that mean to you?

I hope it doesn't sound too presumptuous, but through my work I have managed to see:

- Public administration entities willing to identify more mechanisms to support the initiatives I present to them
- Public servants willing to go the extra mile to achieve environmental goals that benefit residents
- Residents willing to learn about environmental regulations, about the impact of their actions on the environmental quality of the city; this last case in particular is a milestone in my career. A low-educated resident, an entrepreneur, transformed into a resident committed to the sustainability of the city, and a better employer. I am very proud of this.



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BUENOS AIRES

ARGENTINA

Buenos Aires has invested in its air quality monitoring services by renewing and improving equipment installed in its three existing stations, by replacing pieces of equipment that were out of service or had exceeded their useful life.

The city has also begun collaborating with strategic partners on air quality monitoring, particularly to help monitor pollutants not yet measured, such as particulate matter (PM_{2.5}) and ozone (O₃). Argentina does not have a national reference standard for O₃, however Buenos Aires has received support from the U.S. National Institute of Standards and Technology (NIST), to ensure the city can trace O₃ levels in the air. The National Atomic Energy Commission (CNEA) also assisted with measurements of PM_{2.5} levels collected at La Boca monitoring station.

The aim of these actions is to measure all pollutants in order to meet the World Health Organization (WHO) air quality guidelines, and eventually expand Buenos Aires' air

quality network for robust, precise and reliable data. Buenos Aires' new air quality standards established in accordance with the 2005 WHO air quality guidelines will be implemented in five stages. The city is currently completing the third stage, which requires a large reduction of particulate matter (PM₁₀, PM_{2.5}) ozone (O₃), nitrogen dioxide (NO₂), sulphur dioxide (SO₂), and carbon monoxide (CO).

The city is also demonstrating what delivering air quality action that is inclusive and equitable looks like in practice. Public transport passenger waiting environments are being constructed using human-centred design principles and a gender perspective to mitigate physical, communicational and social barriers in public transportation. Bus stops located in areas where there is a high concentration of caregivers, for example, are being designed with more comfortable equipment including resting places, elevated platforms, specialised signage etc.



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GUADALAJARA

MÉXICO

The City of Guadalajara has continued to advance its air quality commitments since the last reporting period.

The city is tackling emissions with impactful measures across different sectors, including:

- The design of a low emission zone and studying the co-benefits the action will bring to residents. The project began with the support of C40's Urban Climate Action Programme.
- Continued tree planting across the city to achieve the goal of 23,000 new trees in Guadalajara.
- Expansion of the network of solid waste collection points and increasing the waste collected by 138% compared to 2021.
- Construction of the Paseo Alcalde extension in 2023, now connected with Plaza Luis Barragán. Paseo Alcalde is currently used by more than 3,000 cyclists on average per day.
- Implementation of a new Bus Bike lane, a 3.72 km shared road that connects the centre of the city with the west. The 7.1 km Javier Mina cycle path was also built, connecting the east of the city to the centre.



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LIMA

PERU

Lima has continued to implement ambitious climate action since joining the C40 Clean Air Accelerator. Since the last reporting period, this includes:

- The Air Quality Monitoring Network and its lower cost monitors have been endorsed in two municipal plans and policies, making compliance a legal requirement.
- The city is implementing measures aimed at prohibiting the use of pyrotechnic products in activities organised by the Metropolitan Municipality of Lima (MML).
- Lima is monitoring air quality after fires in the city, in accordance with the provisions of the Fire Contingency Plan of the Province of Lima 2022-2023.

In 2023, Lima has also continued to implement its 'Breathe Clean' campaign, which aims to improve the city's air quality by raising awareness and monitoring greenhouse gas

(GHG) emissions produced by vehicle fleets. This informs drivers about the consequences of environmental pollution and encourages them to reduce their emissions.

City staff also attended C40's Regional Academy of Zero Emission Areas, strengthening capacity on issues related to the design and implementation of low or zero emissions areas. In 2024, the city will work on the first phase of a low emissions zone with key stakeholders in the municipal corporation, particularly PROLIMA and Urban Mobility Management.

In addition, Lima has worked with the recovery of organic and inorganic waste, and waste from electrical and electronic equipment (RAEE). This consists of minimising generation, maximising selective collection and modernising infrastructure for the recovery of organic and inorganic waste to reduce GHG emissions and improve air quality.



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MEDELLÍN

COLOMBIA

The Medellín Future Development Plan 2020–2023 is designed to transform Medellín into an eco-city. The plan contains goals to reduce pollution levels, encourage remote and flexible working, strengthen public transport services with new and improved technology, and strengthen cycling infrastructure. The district administration also hosts training and educational sessions for residents, communities and companies alongside communications campaigns to help raise awareness about air quality and climate issues.

The city will focus on air pollution in the Aburrá Valley during the transition between dry and rainy seasons. The city's Integrated Air Quality Management Plan (PIGECA) has 10 thematic axes that the government, private sector, residents, and academia must implement by 2030 to improve air quality in the Metropolitan Region.

Medellín's Climate Action Plan (CAP) 2020–2050 contains goals to reduce greenhouse gas (GHG) emissions, achieve carbon neutrality and adapt to the impacts of the climate crisis. The CAP will help meet the goals of Colombia's Nationally Determined Contribution (NDC) as required by the Paris Agreement. The plan is designed to align with the UN's Sustainable Development Goals and contains long term emissions reductions goals and air quality targets.

Medellín is also one of 271 signatories of the Pact for Air Quality, an initiative that invites public, private, academic, and community entities at national, regional, and local levels to commit to air quality improvement in the metropolitan area. This evidence-based initiative requires air quality monitoring to measure progress across different themes including transport (i.e. private vehicle emissions, freight); sustainable production and consumption; emission reduction from business, industry and construction; education and public awareness. The initiative raises awareness and provides training for signatory entities on air quality and climate issues.

Departments across the district administration of Medellín are working together to:

- Coordinate projects, programmes, activities, actions, strategies, and policies to mitigate the emissions of economic activities.
- Strengthen the institutional role in the enforcement and regulation of land use in the district.
- Improve the environment and quality of life of the population through strategies aimed at preventing, reducing, correcting, and controlling the impacts generated by the economic activities that take place throughout the district.

Medellín has been working to deliver a transport system that everyone can access. The city's transport measures include:

- Projects that accelerate the implementation of low and zero emission transport in individual, collective, freight, special, and inter-municipal transport in the city and the Metropolitan Area.
- The implementation of an Urban Protected Air Zone (ZUAP) in the city centre to reduce traffic.
- Promoting and incentivising low and zero emission transport in collective, individual, and freight public transport.
- Planning, promoting and executing mobility projects that provide universal access to transport with a particular focus on gender and equity.



- Promoting walking and cycling and integrating both within the SITVA public transport network and in public spaces, to encourage a switch to low and zero emission transport.
- Develop strategies to control mobile polluting sources.



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MEXICO CITY

MÉXICO

Mexico City is improving the air quality in the metropolitan area of the Valley of México (ZMVM) through the implementation of ProAire ZMVM (2021–2030). The policies and initiatives of the ProAire Programme are designed to reduce the pollutants and protect the health of the population by encouraging the use of public transport, walking and cycling, among other actions. It is designed to address highly polluting sectors, as well as develop research and regulation.

Successful measures implemented as part of the ProAire Programme in 2021 and 2022 were as follows:

- Acquired of *Metrobús* (BRT) units with electric technology and units with lower emissions technologies (EURO VI and EURO V DPF)
- Acquired of vehicle units to renovate and restore the *Trolleybus System* (STE)
- New Trolleybus line 10, as well as Line 1 and 2 of the *Cablebús* cable car system
- Acquired of units for the Passenger Transport Network with low-emission technologies (EURO V and EURO VI)
- Line 1 of the metro system modernised, with 22 km of renovated tracks
- Publication of self-regulation programme to promote electric mobility in freight transportation
- Solar heaters installed in homes built by the city government

- Reforestation of land, more than 11,000 hectares of conservation land and 1,700 hectares in urban forests and areas of environmental value
- Training of forest fire firefighters
- More than 32,000 rainwater harvesting systems installed

By the end of 2024, Mexico City will have carried out:

- Construction and operation of the line 3 of the Cablebús
- Expand the public sharing bicycle system Ecobici
- Renovation of the Line 1 of Subway system

Patricia Camacho Rodríguez

Director of Emissions Inventories and Air Quality Programmes, General Directorate for Air Quality, Secretariat of the Environment (SEDEMA), Mexico City

“Improving air quality depends on multiple factors such as economic activity, the participation of the industrial sector, the climate and something fundamental, the participation of us as urban residents. If we do not work together to reduce our emissions, the actions established by the government will not be sufficient.”



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QUITO

ECUADOR

Since September 2022, the City of Quito has introduced measures to improve its air quality and meet World Health Organization (WHO) air quality guidelines. These efforts are mainly focused on compliance with Ecuadorian and WHO air quality guidelines for pollutants including particulate matter ($PM_{2.5}$, PM_{10}), nitrogen dioxide (NO_2), ozone (O_3), carbon monoxide (CO), and sulphur dioxide (SO_2). The city is seeing improvements, but there are challenges to overcome, especially with respect to CO, NO_2 and O_3 .

The city is working on expanding its air quality monitoring network with new stations, and air quality monitoring is being carried out in areas near thermoelectric plants.

Quito is implementing a Healthy Municipalities, Cities and Communities programme led by the Pan American Health Organization (PAOH) to promote health and air quality. This involves a coordinated effort across sectors.

The city has introduced its first metro line, Quito Metro, which is transforming the way

people travel in the city. Quito is also developing a project that promotes active travel and is planning to implement more cycle infrastructure. Areas of the historic centre continue to be pedestrianised, and measures such as ‘Hoy no circula’ no-drive days and vehicle use restrictions have been implemented to reduce traffic.

The city is promoting the transition from fossil fuel vehicles to electric vehicles through incentives such as parking discounts and tax reductions. Quito is working on a proposal for a new ordinance to promote zero emission vehicles. Mandatory control of private and public vehicles is maintained to guarantee safety and reduce pollutant emissions. The city is also gradually renewing public transport and taxi fleets with zero emission vehicles.

Quito is introducing urban tree planting and restoration of vegetation cover programmes to improve the city landscape. Some goals have been achieved, such as the planting of one million trees, and work is being done to recover green areas that will help the city adapt to the impacts of the climate crisis.

María Valeria Díaz Suárez

Responsible for Research, Analysis and Monitoring in the Directorate of Regularization and Environmental Control, Secretary of Environment, Metropolitan Municipality of Quito

> What is your role in the city and which activities are you and your team proud of?

I head up the network that analyses and monitors air quality using municipal funds. I believe that we can produce significant information for the public arena. With our work we are guiding public policy in improving air quality, we are raising awareness amongst the residents of Quito about the quality of the air that they breathe and helping them access better public transport services and public space. Our role in the city is to raise awareness of decision makers and residents and improve the quality of life in Quito.

We are proud to have set up and started, in 2003 in Ecuador, the first network of atmospheric monitoring and its predecessor, the first citizen air quality network. The equipment was set up using equipment that measured air quality using passive monitoring techniques. These were adapted for manufacture and analysis in our lab and installed in local houses. These people became Quito's air quality guardians.

> What inspires you about your work improving air quality in your city and working to achieve the C40 Clean Air Accelerator commitments?

I have always been a believer of using science to help residents. As public servants, our job is to ensure that our lab work is understood and clear to our residents. I love knowing that our team is able to provide the support needed to set up projects and actions to improve lives and make Quito a better city to live in.

> What impact has your work had on the quality of life of people in your city, and what does that mean to you?

We have managed to implement various public policies to improve air quality. The vehicle technical inspections, the "pico y placa" vehicle use restriction and the low emission zone in the historic city centres. This has brought real improvements to life quality. There is less traffic and less exposure to pollutants at street level and improvements for vehicles, particularly public transport. This means shorter journey times and better quality of life for people living in Quito.





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RIO DE JANEIRO

BRAZIL

Since the last reporting period, the City of Rio de Janeiro has advanced in the planning of its low emission zone and strengthened partnerships to improve air quality services. The city has embedded air quality management across the municipality and established a permanent technical committee focused on the subject. The committee is made up of professionals representing different areas of air quality activity, with the aim of expanding knowledge about the causes and effects of air pollution in the city.

Through the C40 Global Technical Assistance Programme two important products were developed in 2023 that will allow Rio de Janeiro

to progress its commitments to the C40 Clean Air Accelerator. The city has developed an air quality monitoring plan and a communication plan supported by the use of C40's AQUA tool, both of which focus on the Low Emission District of Rio de Janeiro.

In addition to planning, the assistance provided by C40 also provided Rio de Janeiro with the opportunity to expand its particulate matter (PM_{2.5}) monitoring capacity in the Low Emission District through the provision of two compact air monitoring stations, which began operating in May 2023.



SIGNATORY CITIES IN

NORTH AMERICA



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AUSTIN

UNITED STATES

As part of Austin’s goal to continue improving air quality in the central Texas region, the city is working to ensure that it not only meets but exceeds the 2005 World Health Organization (WHO) air quality guidelines and the Environment Protection Agency (EPA)’s National Ambient Air Quality Standards.

In order to achieve this goal, the City of Austin continues to support the implementation of its Regional Air Quality Plan and Climate Equity Plan.

Both plans aim to reduce the use of fossil fuels in transportation and energy generation. Major efforts are underway to help residents use public transport, cycle or walk, as well as to switch to

electric vehicles. Since the last reporting period, the city has increased the amount of local air quality monitoring through real-time small-scale air quality monitors and a research project with the University of Texas.

More information about the implementation of the Climate Equity Plan can be found on the publicly available [implementation dashboard](#).

The city has also been working to develop additional programmes such as Project Connect, a full-scale public transportation system in Austin, as well as the Austin Energy EV Buyers Guide to support the addition of electric vehicles.



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HOUSTON

UNITED STATES

Houston established baseline air pollution levels in 2018 and continues to work to achieve air quality in line with World Health Organization (WHO) air quality guidelines. The city is expanding its monitoring capability and pursuing different methods of pollutant reduction.

- In 2022, Houston applied for an U.S. Environmental Protection Agency (EPA) grant to monitor the pollution around a TPC Group (previously known as Texas Petrochemicals) plant, which had a significant increase in the levels of 1,3-butadiene air pollution in the neighbourhoods surrounding the plant. The city was awarded the grant to monitor these levels in the neighbourhoods. This project will begin its monitoring phase in 2024.
- The city is also installing Sensor Pod (SPOD) monitors which collect a sample at set photoionization detector (PID) concentrations. The SPOD monitors are a sensor system for volatile organic compound (VOC) concentrations, and when the VOC concentration reaches a prespecified threshold, it deploys a canister for a more specific analysis.
- In partnership with Harris County, the Environmental Defense Fund and local consulting firm StatAnalytics, the city has developed a comprehensive air quality report which integrates results from the air monitors around the City of Houston.
- The city is working on deploying an asthma dashboard as a resource to mitigate and minimise the effects of asthma, and to provide information on asthma emergency department rates in the city to policy makers.
- Houston is continuing to operate its Benzene email alert monitoring system, Mobile Monitoring, night-time monitoring, and Asthma Aware alerts, working to have as robust a monitoring system as possible and to reduce the adverse effects of pollution.
- The city supported Houston Wilderness by providing maps to support a grant application to help address heat issues with an environmental justice and community approach.



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LOS ANGELES

UNITED STATES

Since the last reporting period, Los Angeles has worked with the South Coast Air Quality Management District (SCAQMD) in the adoption of its 2022 Air Quality Management Plan. This outlines the city's plan to meet the Federal 2015 8-hour ozone standard of 70 parts per billion (ppb) set by the Environmental Protection Agency (EPA).

Currently, the South Coast region is classified in extreme nonattainment. Attainment of the standard requires significant reductions in nitrogen oxides (NO_x) emissions. The Port of Los Angeles is one of the largest sources of pollution in the region. Lowering the port's emissions will be key to help clean the air in the region. The Air District proposes to develop an Indirect Source Rule for the Port of Los Angeles and Long Beach to help regulate mobile sources. Deploying future technologies and accelerating the transition to electric transportation at the Port of Los Angeles is critical to improving air quality in the region.

In December 2022, a virtual kick-off workshop was hosted by the C40 Green Ports Forum with the ports of Los Angeles, Long Beach, and Singapore, marking the official start of the collaboration to create a Green and Digital

Shipping Corridor. This partnership was publicly announced at COP27 at the Green Shipping Challenge. It will focus on a cross-sector alliance between the ports, cities, and key members of the maritime value chain to decarbonise shipping operations related to these two port hubs, as well as increased operational efficiency through digitalisation.

In September 2023, the C40 Green Ports Forum, Ports of Los Angeles, Long Beach, and Shanghai unveiled the [Implementation Plan Outline](#) for the first trans-Pacific green shipping corridor to accelerate emissions reduction on one of the world's busiest container shipping routes.

Other work to reduce emissions include the approval by Los Angeles City Council in December 2022 of a [new ordinance](#) that bans new oil and gas extraction and requires all existing oil and gas extractions stop production within 20 years. This action will especially benefit Black, Latinx and other communities of colour currently living near polluting oil wells, bringing cleaner and healthier air. The city is performing studies to determine if some oil companies operating in Los Angeles may have to shut down operations even sooner.



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PHOENIX

UNITED STATES

Working alongside our regional partners, residents and businesses, Phoenix continues to work toward the city’s goal of improving air quality to meet the Environmental Protection Agency’s National Ambient Air Quality Standards. The city does not have regulatory authority to set reduction targets beyond current regulatory commitments. To establish the air quality baseline in 2022, and to measure progress towards this goal, the city depends on the monitoring capabilities of the Maricopa County Air Quality Department, the region’s regulatory authority.

The majority of emissions in Phoenix are from transportation. As part of the Transportation 2050 programme, the city continues to promote walking and cycling by developing policies like the city’s Active Transportation Plan, and by investing in the infrastructure that is necessary to allow for safe and convenient travel with access to public transit. Since 2021, an additional 100 miles of bidirectional bike lanes have been added for a total of 1,165 miles. The city was a recipient of a \$25 million Rebuilding American Infrastructure with Sustainability and Equity grant that will allow for the construction of the Rio Salado Bike and Pedestrian Bridge that will connect south Phoenix with the city’s downtown region and have a connection to public transit. The city developed the Phoenix Vision Zero Road Safety Action Plan with the aim to reduce pedestrian deaths to zero.

Another safety concern while walking or cycling in Phoenix is the exposure to heat. The Cool Corridors Program aims to establish 100 miles of walking and cycling corridors by 2030, with five

miles having been added so far, also expanding greenspace within the city. The city has made a tree equity pledge with American Forests that will focus on planting trees where residents live and commute.

The city’s Transportation Electrification Action Plan provides a roadmap for the electrification of over 280,000 vehicles in the city by 2030, along with goals for city-owned vehicles, recently awarded Top Green Fleet for 2023 from the US National Association of Fleet Administrators, and placement of electric vehicle charging stations on city-owned properties. The city is also investing in light rail extensions and bus rapid transit corridors. The city also has a plan to transition the city’s 500 buses to zero emission buses by 2040 and received a \$16.3 million greener buses and supporting infrastructure grant from the Federal Transit Administration that will provide funding for the buses and associated infrastructure, as well as assist in workforce development. The first buses are expected to be deployed starting in 2024.

The city is also working with the National Oceanic and Atmospheric Administration and Arizona State University to enhance the current air quality monitoring network using satellites that will be deployed in the coming decade. This data will not replace the regulatory-required monitoring network but may provide additional data to the city that can be used to determine risk, develop decision making thresholds to inform policies, and provide timely air quality warnings to help mitigate the effects of air pollutants and reduce negative public health impacts.



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PORTLAND

UNITED STATES

Since the last reporting period, the City of Portland has adopted several plans that will advance projects and programmes related to air quality and carbon emission reductions. These plans and projects will direct the city’s work for the next several decades and reinforce Portland’s commitment to the C40 Clean Air Accelerator. These plans and projects include the Climate Emergency Workplan, the Electric Vehicle (EV) Ready Code Project, the 2040 Portland Freight Plan (2040Freight), and the Portland Clean Energy Fund (PCEF) Climate Investment Plan.

In the third quarter of 2022, the Bureau of Planning and Sustainability released a three-year Climate Emergency Workplan to reduce emissions, sequester carbon, and build community resilience. It includes forty-seven actions to reduce the release of carbon and other air pollutants through strategies in the transportation, land use, development, industrial, and utility sectors. The Climate Emergency Workplan adds new actions and reinforces many ongoing projects and initiatives across the city.

The EV Ready Code Project was adopted by Portland City Council in February 2023 and went into effect in March 2023. The Electric Vehicle (EV) Ready Code Project amended the Portland Zoning Code to require all new multi-dwelling and mixed-use development with five or more units — that include onsite parking — to provide EV-ready charging infrastructure at higher rates than required by State of Oregon rules. This project aims to expand EV access especially to low-income communities and communities of colour, and to support a climate-friendly future by minimising future retrofit-related costs.

2040Freight was unanimously adopted by Portland City Council in July 2023. It had last been updated in 2006. The adopted plan has 52 total actions with 29 priority actions. Of the nine Environmental Goal actions, seven are designated as a priority in the next ten years. These seven priority actions range in areas from pilot projects to community collaboration to supporting regulatory agencies and research.

In 2018, Portland voters approved the Portland Clean Energy Community Benefits Fund (PCEF). PCEF is a groundbreaking initiative in that it provides a consistent, long-term funding source and oversight structure to ensure community climate action efforts are implemented to support social, economic and environmental benefits for all Portlanders, particularly communities of colour and people with low incomes. The initiative was supported by a broad coalition of groups and individuals and represents the first environmental initiative in Oregon led by communities of colour.



These are only four plans and initiatives listed and reported in this year's Air Quality Accelerator Report. This is not an exhaustive list, and there are likely many more projects across partner agencies and bureaus that are making a positive impact on air quality and climate in Portland and its communities.

The City of Portland continues to rely on the Oregon Department of Environmental Quality's (DEQ) ambient monitoring to establish air pollution baseline levels. The city's most recent monitoring report is for the year 2021.

Annual mean particulate matter ($PM_{2.5}$ and PM_{10}) levels remained below the annual average National Ambient Air Quality Standards (NAAQS). For ozone, the 2021 8-hour mean (4th highest values) was 61 ppb while 2020 was 59 ppb. However, the DEQ noted that the ozone monitor malfunctioned during the extreme smoke in 2020. The three-year average with 2021 data trends below the NAAQS, consistent with the three-year average in 2020 reporting. Nitrogen dioxide (NO_2) levels at both reference monitoring locations in Portland are continuing to show decreasing trends and are below the annual and hourly NAAQS.

The city does not have regulatory authority to set reduction targets beyond current regulatory commitments, the US Environmental Protection Agency (EPA) NAAQS. While there is not an explicit focus on setting additional reduction targets, the City of Portland continues to partner, identify, and invest in various projects and policies that intersect with air pollution reduction.



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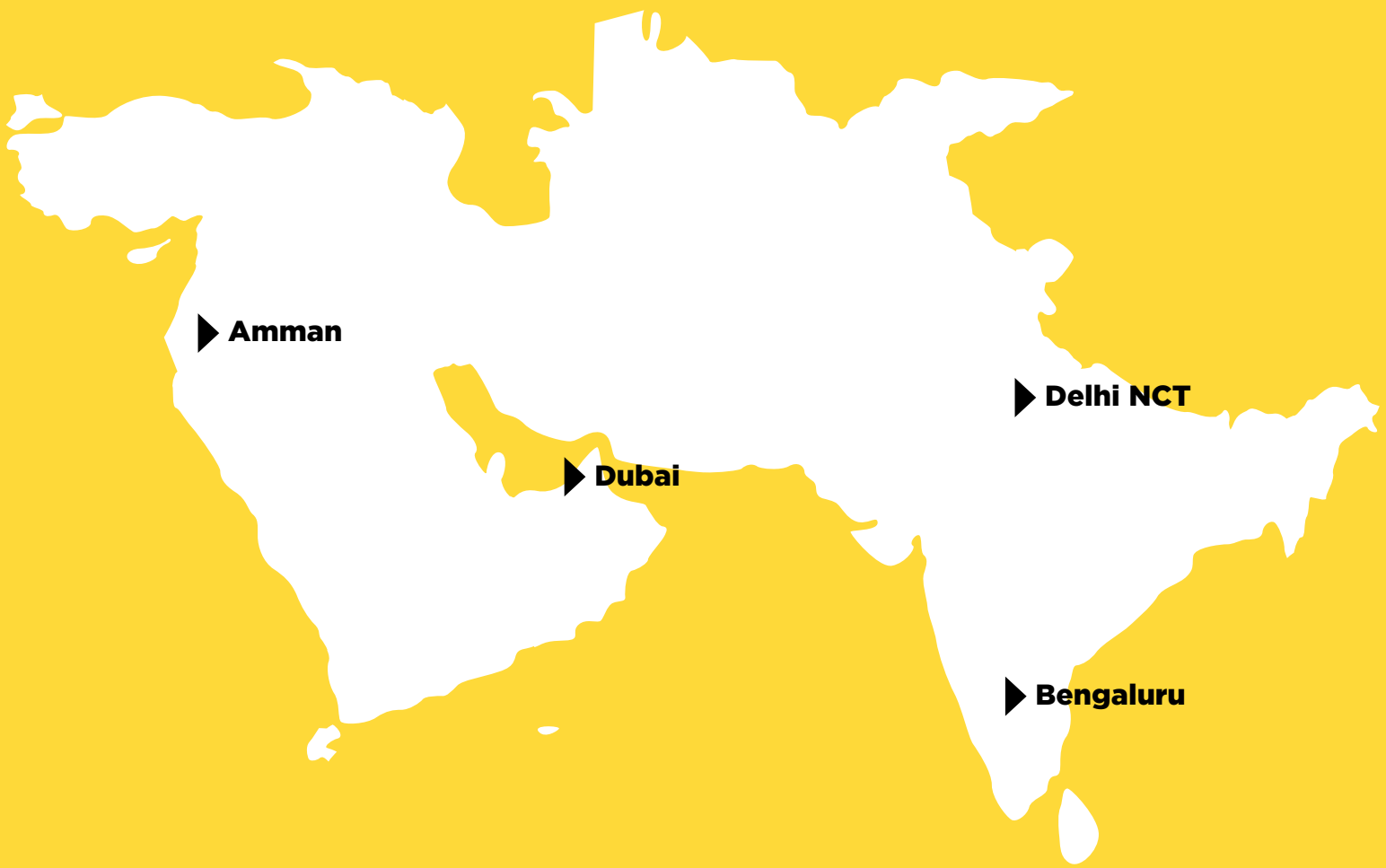
WASHINGTON, D.C.

UNITED STATES

The District of Columbia continues to monitor air pollution following the Clean Air Act mandate. The District currently has a five-station ambient air monitoring network and is working to expand the monitoring network by deploying a new ambient air monitoring station in an overburdened community of Ward 8, with federal American Rescue Plan (ARP) Act funding. In addition, the Department of Energy and Environment (DOEE) launched a hyperlocal air quality monitoring pilot programme with a focus on equity, for three priority communities in Ivy City/Brentwood, Buzzard Point and Mayfair at the Kingman and Heritage Islands in Ward 7. The effort to map hyperlocal air pollution and greenhouse gases at the community block level will provide valuable insight into the differences in air quality and emissions in these communities.

Some of the work the District is implementing to tackle emissions include the announcement in August 2023 of a broad-ranging Transportation Electrification Roadmap (TER) to help the District transition its local transportation modes to zero-emission vehicles by 2045. The TER is an encompassing plan to help Washington, DC become carbon neutral by 2045. The plan has intermediate goals including achieving at least 25% zero-emission vehicle registrations by 2030.

DOEE is also working to promote active travel with initiatives like e-bike solar charging demonstration project, which aims to create docking stations that provide charging from solar energy. This project will increase mobility options that will enable a transportation mode shift away from single occupancy vehicles, improve air quality, and reduce greenhouse gas emissions.



SIGNATORY CITIES IN

SOUTH AND WEST ASIA



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AMMAN

JORDAN

Since September 2022, the Greater Amman Municipality (GAM) has achieved significant success in key sustainability areas to improve air quality in the city.

Amman is working to set new air quality targets aligned with World Health Organization (WHO) air quality guidelines and expand its air quality monitoring network to measure success. GAM is also investing in accessible data management by establishing a central database for its Geographic Information System (GIS).

Amman has also introduced a range of transport measures to help improve air pollution. The city has successfully completed the first phase of its Bus Rapid Transit project, which aims to provide frequent, accessible bus services across the city. This builds upon the Bus Amman project launched in 2019, which provides smart, low-emission and electric transport to city residents. Amman will also soon implement the first phase of its Low Emission Zone (LEZ).

The city is expanding green spaces from 1.6% to 2.5% by the end of 2026, with planting initiatives in King Abdullah II gardens and the Telal Alphosphat Project, which will help restore an area contaminated with phosphate mine waste through reforestation.

Amman has also introduced green building measures to help improve indoor air quality. GAM is collaborating with the Sustainable Urban Development and Resource Efficiency (SURE) project with the support of the United Nations Development Programme (UNDP) on green building codes, including thermal insulation systems and energy-saving measures. The city is also working with the International Finance Corporation and the World Bank to develop green building policies and regulatory frameworks, and raise awareness among stakeholders. Amman has also passed legislation to phase out fossil fuels for heating and cooking, to help improve indoor air quality.

Amman is also switching to renewable energy through solar water heating incentives, solar energy farms, and solar panels on municipal buildings and parking lots. The city is replacing over 1,100 lighting units in public parks and squares with energy-saving LED lighting units, along with the installation of the Smart Lighting Control System (SLCS) to reduce electricity consumption and emissions.

Amman is updating its Climate Change Plan to align with national and international goals, with support from UNDP and UN-Habitat through the SURE project. The city is engaging the public in Amman's sustainability efforts and raising awareness of the climate crisis through community campaigns, surveys, and educational programmes.



Sajeda Mohammad Abdallah Alnsour

Manager of Projects Sustainability Unit, City of Amman

> What is your role within the city, and what actions have you been involved in with your team that make you proud?

My role in the city is primarily related to environmental sustainability and urban development. I worked with my team to support projects that significantly improved the environmental conditions of the city.

Key programmes and projects I have been involved in include:

1. Creation of green spaces: aimed at expanding public green spaces in the city, and to the development of projects to plant native trees and plants in specific areas for supply purposes environment and air quality such as the Urban Micro-Lungs Project and how to create urban forest by using the Miyawaki method.
2. Urban Development and Infrastructure: Play a role in improving urban infrastructure such as social development by developing green infrastructure in the poverty-stricken area of Amman.
3. Community Engagement and Awareness: Engaging with the community through various campaigns, platforms, and initiatives, and awareness programmes for green initiatives using various approaches such as tactical urbanism.

Together, these actions contribute to the city's progress in environmental sustainability, energy efficiency, waste reduction, and the creation of a more liveable urban environment.

> What inspires you in the work you do to improve air quality in your city in order to achieve the commitments of the Clean Air Accelerator?

The extensive initiatives aimed at improving air quality in Amman are inspiring in themselves. Collaborative commitments and efforts across sectors within the City reflect a deep commitment to improving environmental conditions, particularly air quality, and promoting sustainable development. In my role helping to support initiatives related to improving air quality, several aspects inspire and particularly motivate the work:

1. Effective Partnerships and collaborative efforts involving various sectors and stakeholders in Greater Amman Municipality reflect a shared commitment to address air quality issues comprehensively. The collaboration with the Ministry of Environment also includes providing the City of Greater Amman with important information on air quality indicators.
2. Being part of projects that are implementing innovative solutions.
3. Environmental Reclamation: It helps in rehabilitating and greening polluted areas.
4. Participation in projects focused on urban development and transport improvements.
5. Engaging with communities through awareness programmes, networking events and community engagement programs.

> What impact has your work had on the quality of life of your city's residents, and what does this mean to you?

The impact of my work has been profound and multifaceted. First, the focus on environmental sustainability and urban development has greatly improved the quality of life in the city. Projects such as the expansion of green spaces and the implementation of the Miyawaki Method of Urban Forestry have particularly improved the environment and air quality. This translates directly into a healthier lifestyle for residents, reduces pollution and provides places for recreation and leisure.

Moreover, efforts in urban development, especially in poverty-stricken areas, have raised living standards, improved the environment and the wellbeing of communities by providing quality habitats and addressing issues related to poverty.

Community engagement and outreach campaigns have created a sense of shared responsibility and active participation within the community. Engaging residents and empowering them to participate in projects that improve their city creates a strong sense of belonging and ownership, leading to sustained positive changes.





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BENGALURU

INDIA

Bengaluru received a grant of INR 1.16 billion (US\$ 13.9 million) from India's central government under the National Clean Air Project (NCAP) in 2021-22. Since the last reporting period, Bengaluru has been implementing the city's clean air action plan with a range of stakeholders and agencies across the following eight areas:

1. Junction improvements at 25 locations that experience heavy traffic congestion, delivered by the Directorate of Urban Land Transport (DULT) and Bruhat Bengaluru Mahanagara Palike (BBMP).
2. Development of pedestrian walkways by DULT and BBMP.
3. Creation of nurseries to develop new plantations and increase green coverage in Bengaluru, delivered by BBMP.
4. Development of new parks by BBMP.
5. Lane disciplinary measures by Bengaluru Traffic Police.
6. Procurement of 100 electric buses by Bengaluru Metropolitan Transport Corporation (BMTCL).
7. Construction of large solid waste management transfer stations by BBMP.
8. Procurement of mechanical sweepers by BBMP to reduce the recirculation of particulate matter from roads.

Bengaluru received an additional INR 530 million (US\$ 6.4 million) in 2023 and has since developed an implementation action plan.

The new identified actions include:

1. Procure air quality monitors to measure particulate matter (PM₁₀, PM_{2.5}) and gaseous emissions to help set targets and tackle air pollutants.
2. Set targets for emissions reductions by carrying out pollution estimates from the industrial sector.
3. Monitor the ambient air quality of pollution hotspots such as operational municipal dumping sites and landfills in the city, through the procurement of 4 BS-VI-Mobile Monitoring Vans for dedicated analysis of PM₁₀, PM_{2.5} and other gaseous emissions.
4. Establish an Integrated Control and Command Center to handle air pollution complaints in an effective manner and integrate with the Continuous Ambient Air Quality Monitoring Stations (CAAQMS) network and daily air quality public information dissemination system (VMS Display boards) for Bengaluru.
5. Carry out capacity studies of industrial areas in Bengaluru such as Peenya and Jigani.
6. Conduct a capacity building and public outreach programme to engage residents in clean air issues in Bengaluru.



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DELHI NCT

INDIA

Delhi has been steadily progressing on its path toward a sustainable future, with a focus on energy, infrastructure, transport, and the wellbeing of residents. Air pollution is one of the city's most urgent environmental and health challenges.

One of Delhi's key clean air initiatives to tackle air pollution is the continuous real-time monitoring of air quality, with 40 monitoring stations strategically placed throughout the city. These stations contribute to data-driven decisions on pollution control.

The city has established real-time Source Apportionment (SA) to establish information about pollution sources and the amount they contribute to ambient air pollution levels. This provides crucial insights to pollution sources such as vehicles, dust, biomass burning, stubble burning, and industrial emissions. This helps the city formulate recommendations for short, medium, and long-term pollution reduction strategies. For example, Delhi has introduced guidelines to control emission of dust from the city's construction sites.

In addition to monitoring and understanding pollution sources, Delhi has been actively taking measures to enhance public transport in the city. This includes a focus on last-mile connectivity and the deployment of electric vehicles (EVs). Delhi now has 1,300 electric buses in its fleet after the procurement of 400 new electric buses in September 2023 and 500 more in December. Delhi has banned the use of conventional fuels and mandated the use of Compressed Natural Gas (CNG) in commercial vehicles as another step toward a greener and more sustainable transport system. The city has introduced Bharat Stage VI (BSVI) emission norms for vehicles which contribute to a significant reduction in vehicle emissions.

Delhi's efforts go beyond pollution control and transportation. The city is actively promoting a sense of environmental community among its residents through the Green Delhi app, a platform that empowers residents to report on environmental issues such as air quality. The app also provides real-time air quality data, including the Air Quality Index (AQI) for specific locations. The app promotes transparency, agency and shared responsibility around environmental challenges.

The city is also working to increase its green cover from 23% to 25% by 2025. This contributes to a more sustainable, healthy and beautiful urban landscape, as well as helping the city adapt to the impacts of the climate crisis. Delhi has the largest per capita forest cover of 9.6 square metres among all the megacities in India.

Delhi is committed to inclusivity and has introduced an initiative offering free bus rides for women, to make public transport more accessible and help reduce emissions and traffic congestion.

Over the years, the government has taken several measures to address waste management challenges in the city. This includes the use of biomining technology to segregate and recover recyclable materials, as well as the closure of landfills. The Delhi government's zero-landfill model offers a technically appropriate, environmentally and economically sustainable solution that is based on resource recovery and circular economy principles. To reduce the volume of waste generated, the Delhi government has banned single-use plastics such as bags, cups, and straws. The government has also imposed fines on those who violate the ban. A policy on alternatives to single use plastics is currently in development.



DUBAI

UNITED ARAB EMIRATES

Since January 2023, the City of Dubai has undertaken the first stages of its Air Quality Strategy 2030 to establish baseline pollutant levels and draft ambitious reduction targets consistent with achieving the national and international World Health Organization (WHO) air quality guidelines. These targets are:

- 90% clean air days by 2030 in accordance with the WHO air quality guidelines
- 100% clean air days by 2040 in accordance with the national standard
- Annual average particulate matter (PM_{2.5}) concentration in residential areas below WHO Interim-1 Guideline Value (35 µg/m³) by 2030

The Dubai Air Quality Strategy 2017–2021 overachieved on its emission reductions targets. The overall target of 90% clean air days was met, recording 99.1% clean air days in the city in 2021. Dubai is developing its Dubai Air Quality Strategy 2030 to set new emissions reduction targets that align with the United Arab Emirates

(UAE) National Air Quality Agenda 2021–2031, Dubai Plan 2030 and C40 commitments.

Dubai has implemented new policies and programmes to address the top causes of air pollution in the city. The UAE Environmental Policy includes increasing national clean air days to 100 percent by 2040 and to reach 35 µg/m³ annual average concentration of PM_{2.5} by 2030.

Additionally, the UAE National Air Quality Agenda 2021–2031, aligned with the General Environmental Policy, was launched in September 2022. Additional relevant policies include the Dubai Plan 2030, Dubai 2040 Urban Master Plan and the Dubai municipality Strategic Plan 2022–2026. To enable successful measuring, the city concluded its particulate matter characterisation and Source Apportionment (SA) for air pollution in November 2022.

BARRIERS TO ACHIEVE THE COMMITMENTS

Tackling air pollution is not a straightforward process. Many cities face challenges and limitations in the design and implementation of actions that tackle the main sources of pollution.

To tackle emissions, cities need to understand their sources and how the impacts are distributed across the city. Setting robust and reliable air quality monitoring networks is a key first step. But cities face the challenge of the high cost of purchasing, installing and maintaining air quality monitors, especially when establishing a city-wide network. In addition, cities need dedicated staff to maintain these monitors, as well as collect and process the data. Having a clear standardised methodology to process collected data can help cities, especially when there are multiple stakeholders involved in air quality monitoring. C40 put together a [guide](#) to help cities overcome this challenge.

Other cities face a different challenge, as they don't directly manage the monitoring of air quality in their territories and depend on other government entities to do so. In these cases cities might face issues coordinating with relevant entities managing monitoring, and have limited access to this very critical data. In these cases, clear lines of communication with these entities should be in place and institutionalised whenever possible.

But financial limitations, staff capacity, limited city powers, and integration and collaboration across levels of government are not just challenges cities face concerning air quality monitoring. These are also challenges to implementing policies and programmes to tackle greenhouse gas (GHG) and air pollution sources.

Many of the actions needed to reduce emissions from main pollutant sources can be costly and need strong coordination across city departments and public support.

In addition, sources of emissions are not always located within city limits or fall under city powers, due to the cross boundary nature of air pollution. This is why cities should also work in close coordination with adjacent municipalities, metropolitan governments and national authorities. This might not always be straightforward, but it is key to tackle all emissions that are impacting residents' health. Through close cooperation, cities can work to create comprehensive action plans that tackle the main sources of air pollution and set air quality targets, as well as allocate the necessary funds to implement actions to reduce emissions from these sources.

Cities also face the challenge of making sure action implementation does not have unintended negative impacts on residents, especially on marginalised communities. In some cases this can increase rent prices and other living costs, including transit tariffs for their daily commutes. Integration of equity considerations in the implementation of actions can help reduce these and increase public support.

Challenges in the implementation of sectoral action are varied and context-specific. C40 provides a space for city officials to come together, share common challenges and learn from each other's successes. Cities can overcome some of these obstacles by centring action on equity, through data-driven design and implementation of actions, engaging residents and communicating the benefits brought by these critical actions that improve cities spaces, environments, and systems, while bringing benefits through the reduction of greenhouse gas (GHG) and air pollution emissions.

CONCLUSION

Air pollution in cities is a pressing issue that requires immediate attention. The combined effects of both ambient air pollution and household air pollution contribute to approximately 6.7 million premature deaths every year. It is therefore crucial to address emissions as soon as possible in order to reduce the impact on residents and mitigate the climate crisis.

C40's Co-Chairs are committed to combating both air pollution and the climate crisis. They are working alongside C40 Clean Air Accelerator signatories to implement ambitious actions that will significantly reduce the primary sources of air pollution and greenhouse gas (GHG) emissions within their control.

To assist cities in overcoming the challenges they face in reducing emissions and improving air quality, signatory cities receive support from C40 through various programmes and initiatives. C40's Air Quality Programme is specifically tailored to address the specific needs and challenges of C40 cities, providing targeted support to help them overcome barriers.

However, cities cannot win this battle alone. Close collaboration across all levels of government is necessary to reduce emissions that are outside of cities' control and to increase investment in global emission reduction efforts. In order to achieve cleaner air, cities are working closely with businesses to collectively reduce emissions across different sectors. Prioritising actions that benefit communities and raise awareness among residents are essential components in achieving the desired outcomes. This approach not only aims to reduce emissions in cities, but also to minimise residents' exposure to air pollution and its detrimental effects as quickly as possible.

C40 will continue to support and collaborate with cities in their efforts to progress towards cleaner, healthier, and more sustainable urban environments. The C40 Clean Air Accelerator will serve as a platform for mayors worldwide to advocate for air quality and raise awareness about the urgent need to address emissions. This initiative aims to garner the necessary attention and drive collective action against the twin threats of the climate crisis and toxic air pollution, which require swift, unprecedented, and united efforts to eliminate the pollution that is harming public health and fuelling the climate crisis.



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