



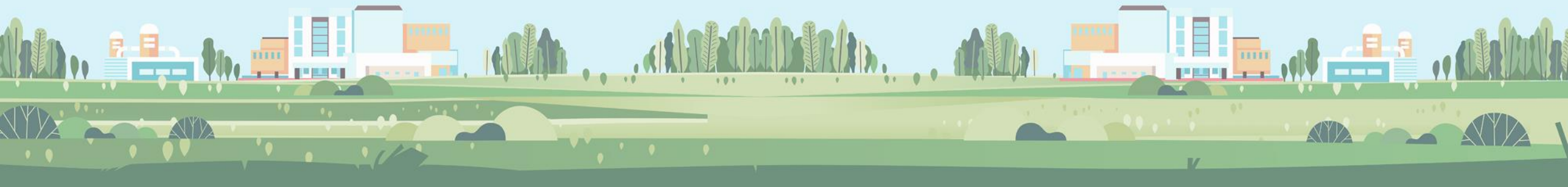
Tackling Climate Change and Air Pollution at the City-Level

Vivian Pun

Technical Head of Breathe Cities, C40 Cities

vpun@c40.org

This is not an ADB material. The views expressed in this document are the views of the author/s and/or their organizations and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy and/or completeness of the material's contents, and accepts no responsibility for any direct or indirect consequence of their use or reliance, whether wholly or partially. Please feel free to contact the authors directly should you have queries.



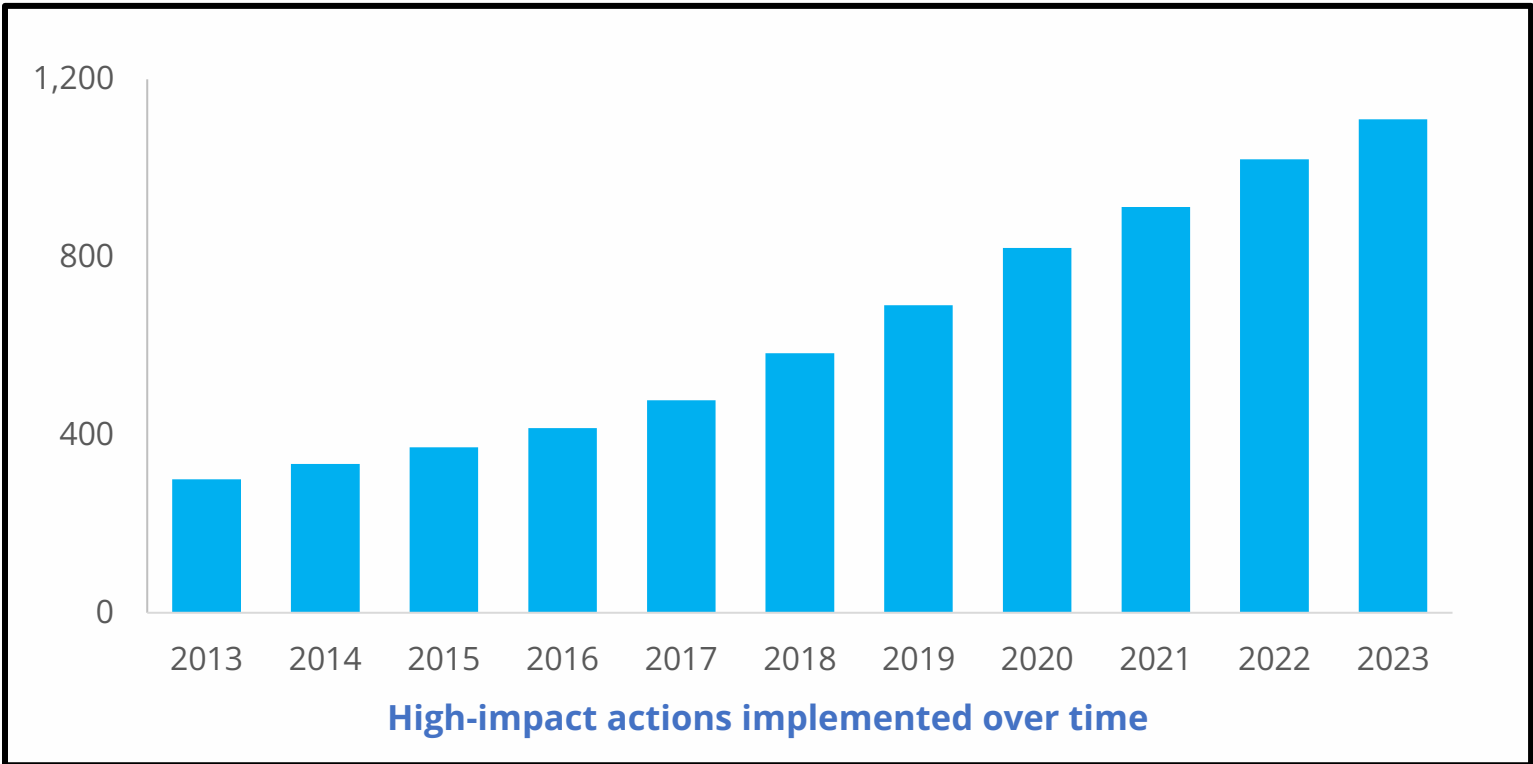
C40 Cities

A network of mayors of nearly 100 world-leading cities collaborating to deliver the urgent action needed right now to confront the climate crisis.

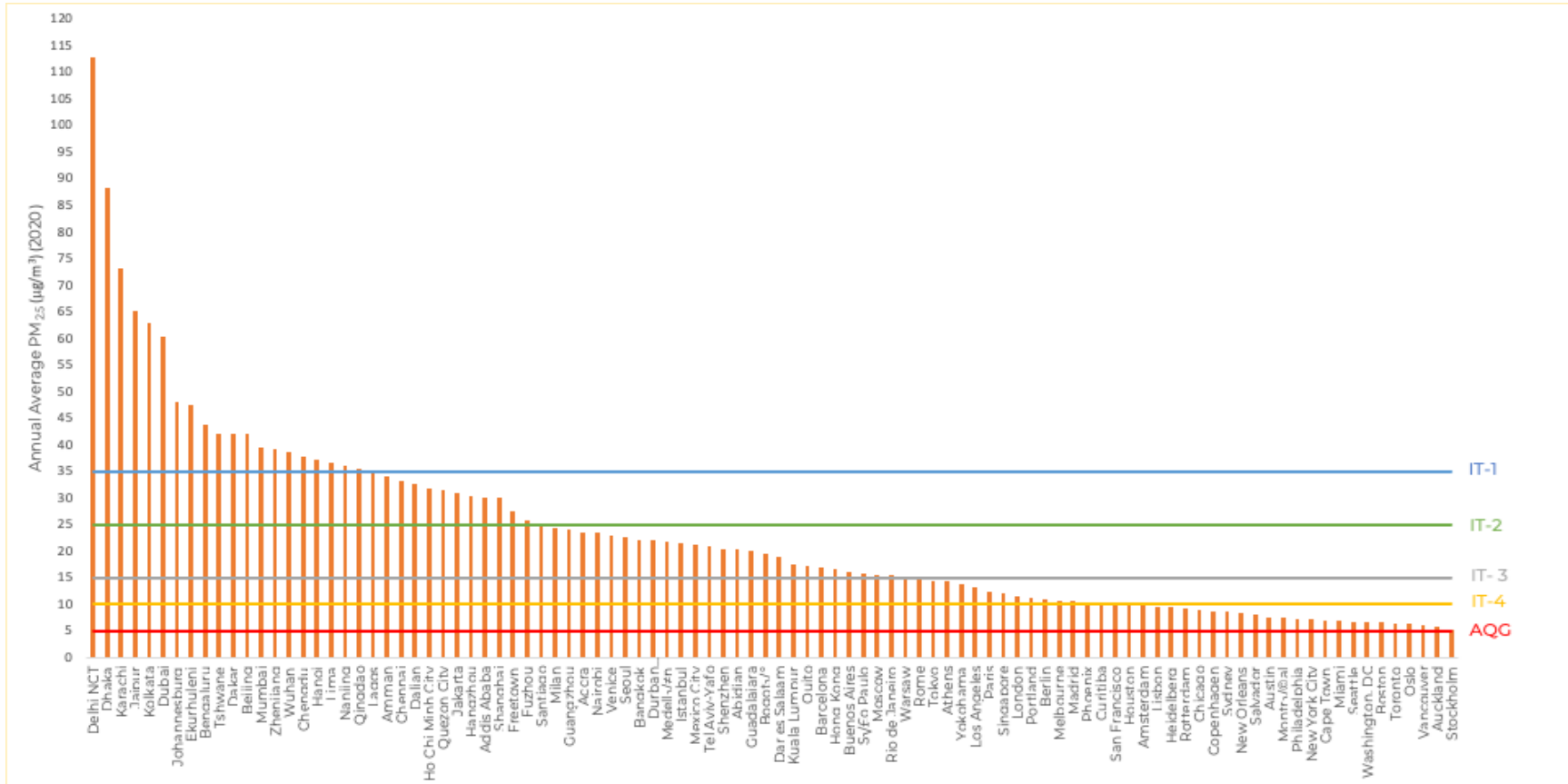


Implementation of high-impact actions is accelerating

In 2023, nearly 100 new high-impact climate actions implemented across all 8 sectors and all 7 C40 regions bringing the total number of actions implemented to over 1,100



Air pollution in nearly all C40 cities is at unhealthy levels



100%
of C40's Cities exceed the WHO AQGs for PM_{2.5}

415,000
premature deaths each year due to poor air quality

365,000
new cases of pediatric asthma each year

Annual Average PM_{2.5} in C40 Cities



Rapid Success is Possible

7% reduction

in annual average PM_{2.5}
concentrations in C40 cities since
2018.

BEIJING - halved in 10 years



NEW YORK - 40% in 10 years



Bring together mayors to advance world-leading commitments on clean air and climate and inspire changes



Political Champions on air quality and climate agendas



Sadiq Khan
Mayor of London
and Co-Chair of
C40



Heru Budi Hartono
Governor of Jakarta



Chadchart Sittipunt
Governor of Bangkok



Joy Belmonte
Mayor of Quezon
City



Oh Se-hoon
Mayor of Seoul and Vice-
Chair of C40 Steering
Committee



C40 Accelerators

Clean Air Accelerator



Green and Healthy Street Accelerator



C40 tracks city air quality actions to measure progress



57 cities have city-wide air quality monitoring



10 cities are shifting away from polluting fuels for heating



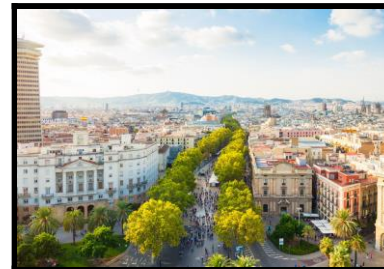
23 cities are procuring only zero emission buses



66 cities have universal waste collection



20 cities are expanding charging station network, incentivising electric car uptake, & electrifying municipal fleets



23 cities are expanding green coverage to better respond to climate change impacts (e.g. flooding, UHI)



Political Commitment on air quality and climate agendas



C40 Mayors Summit



Green and Healthy Streets Roundtable



African Cities for Clean Air Mayoral Forum



Integrate climate, air quality, and health into city planning and decision-making processes



Tool 1: Integrated framework

A nine-step process for **bringing together air quality management & climate action planning**—in a more efficient, streamlined way



[Link to report](#)

INTEGRATED AIR QUALITY AND CLIMATE ACTION PLANNING



Tool 2: Pathways-AQ Tool

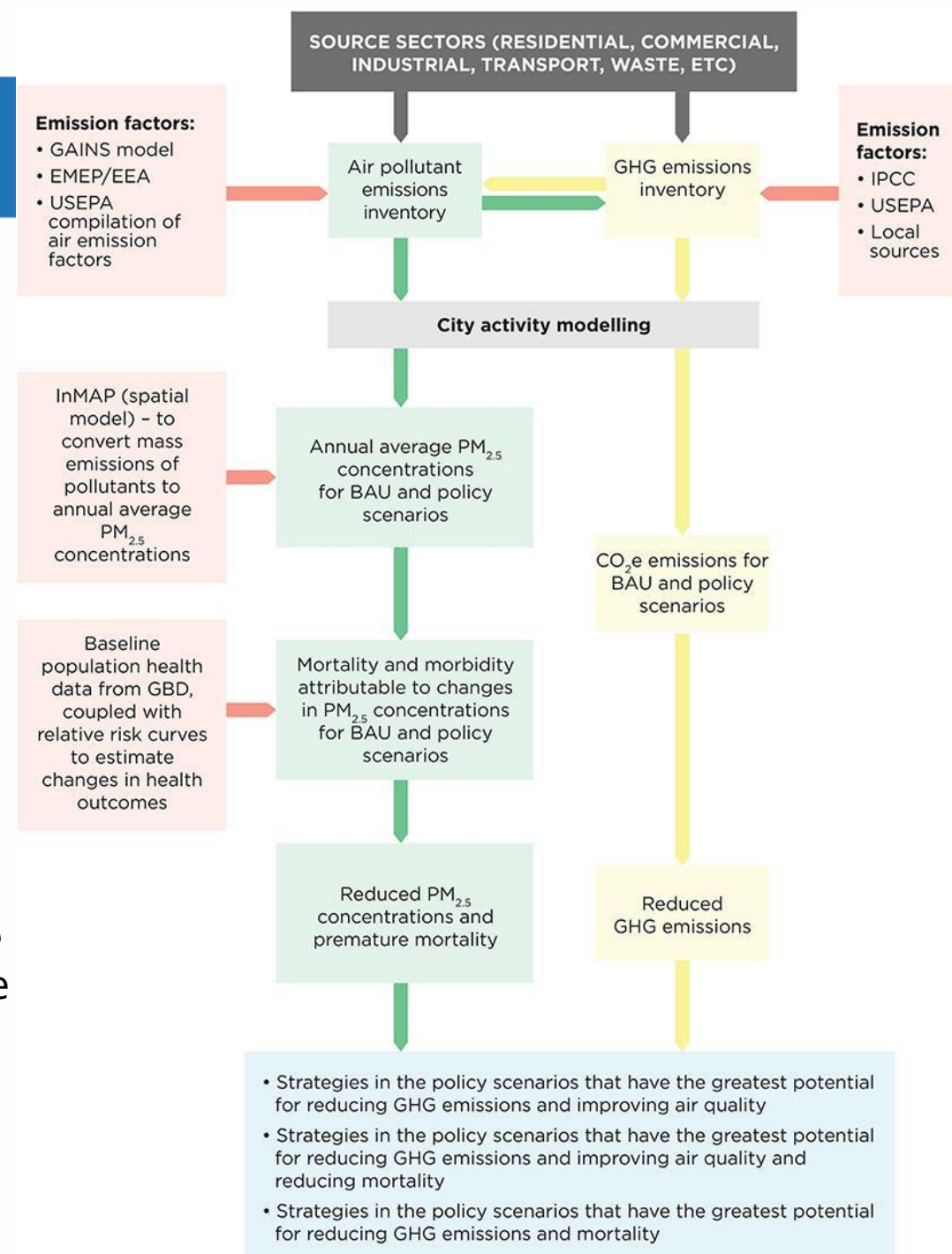


Scoping level tool for cities to **understand air quality (PM_{2.5}) & health implications of city-designed climate policies**

Uses city's GHG inventory and scenario modelling as inputs

- GHG, PM_{2.5} (and precursor) emission factors,
- Sensitivities that convert change in mass of PM_{2.5} to change in city's annual average PM_{2.5},
- Underlying health data,

Outputs: Change in annual average PM_{2.5} and the resultant change in premature deaths in a given year, resulting from chosen climate change mitigation strategies



Addis Ababa (Ethiopia) Climate Action Plan

Challenges:

- 4 PM_{2.5} reference monitors
- No air pollution emissions inventory
- No Air Quality Management Plan (AQMP)

Success:

- Derived air quality emissions based on GHG inventory
- Reflected climate actions in AQMP
- Developed joint steering committee

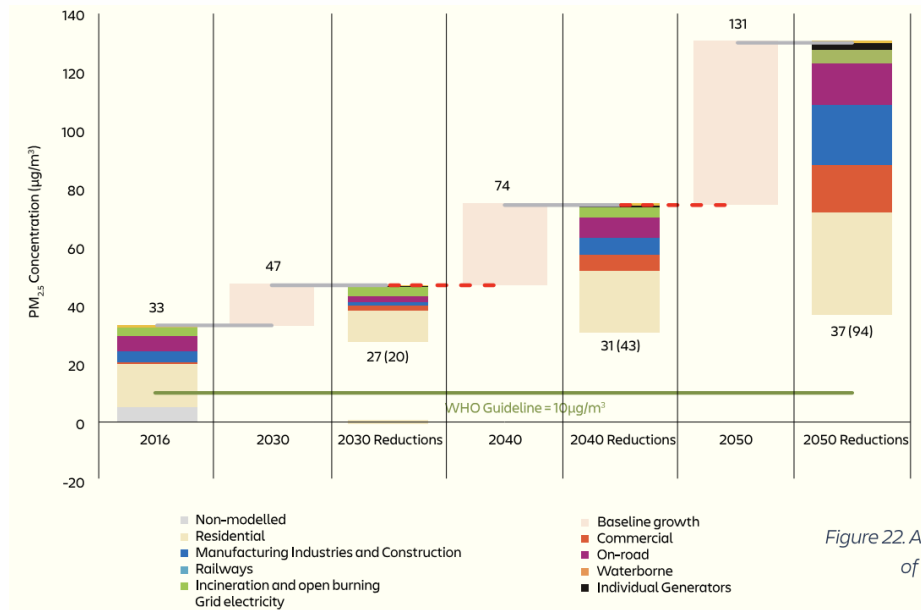
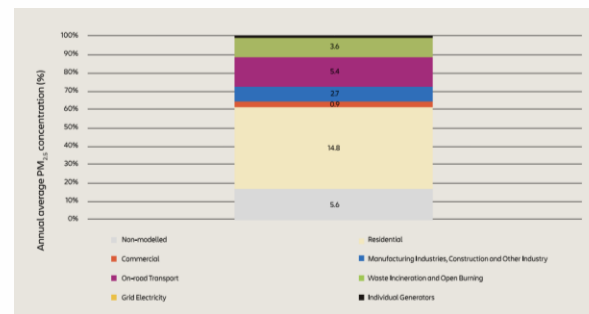
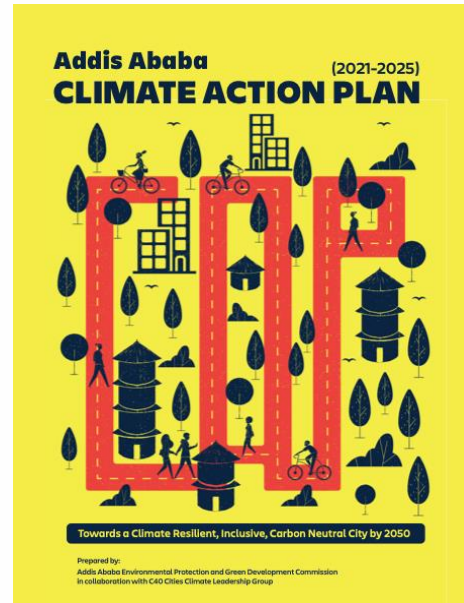


Figure 22. Air quality implications of climate actions in the ambitious scenario

	Change in air pollution (Annual average reduction in PM _{2.5} concentration)	Change in premature mortality (Deaths avoided per year)
Existing and Planned Scenario		
2030	13 µg/m ³	212
2040	23 µg/m ³	284
2050	43 µg/m ³	142
Ambitious Scenario		
2030	20 µg/m ³	364
2040	43 µg/m ³	712
2050	94 µg/m ³	1036

Table 17. Estimated changes in air pollution and premature mortality associated with implementation of Addis Ababa's Climate Action Plan scenarios

[Link](#)



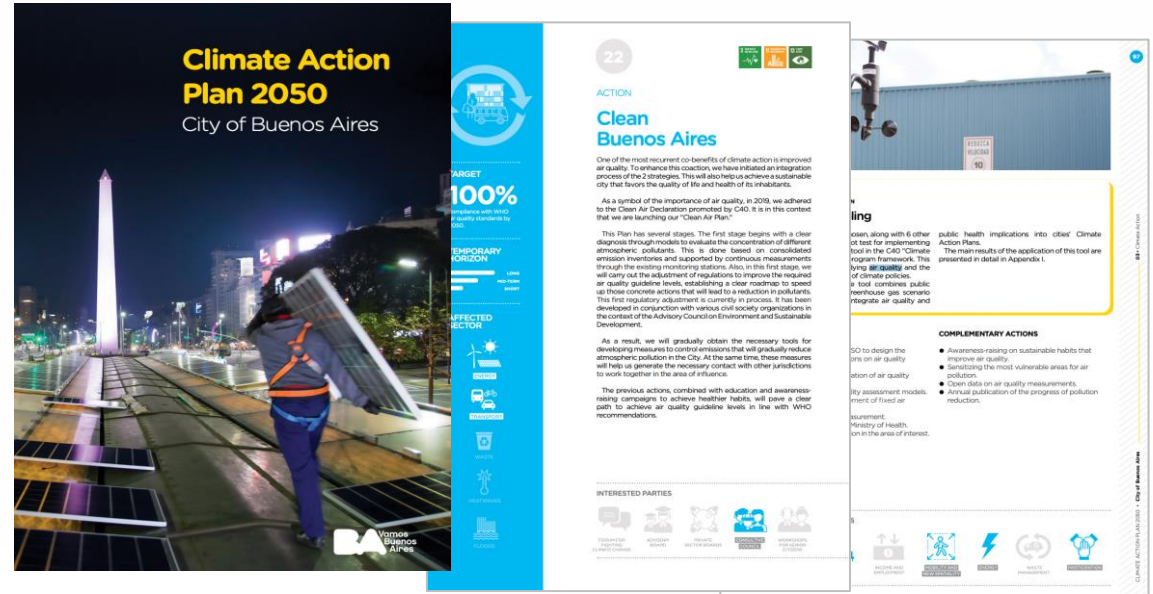
Buenos Aires (Argentina) Climate Action Plan 2050

Challenges:

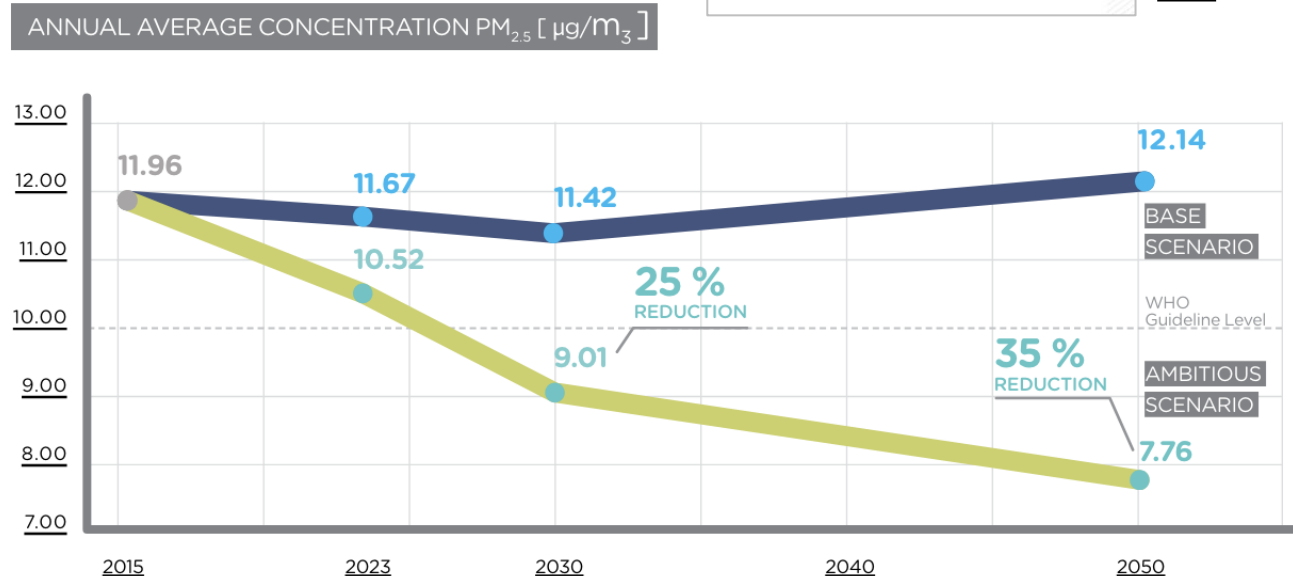
- No PM_{2.5} monitoring capacity
- No air pollution source apportionment

Success:

- CAP-AQ findings inspired for more ambitious commitment towards WHO guideline by 2025.
- Directed efforts where potential for PM_{2.5} reduction is high.
- Launched “Clean Air Plan” initiative to build further interest and resources towards air quality management and monitoring.



[Link](#)



Honorable mentions

Cities aiming for PM_{2.5} reductions through GHG mitigation

Bengaluru, India

Bengaluru CLIMATE ACTION & RESILIENCE PLAN

TOWARDS A NET ZERO AND CLIMATE RESILIENT BENGALURU

SUMMARY OF THE BENGALURU CLIMATE ACTION AND RESILIENCE PLAN (BCAP)

Logos: Bengaluru, Government of Karnataka, C40 Cities

Icons: Water, Heat, Leaf, GHG, People, Lightning, Bus, Trash

Action plan to help make city carbon neutral by 2050

DKS reviews draft, suggests minor changes

BENGALURU, DHNS

After Mumbai and Chennai, Bengaluru is drafting its first Climate Action Plan (CAP), which is designed to serve as a blueprint for the city to become carbon neutral by 2050.

The plan, comprising a total of 269 actions, was finalised at a meeting chaired by Deputy Chief Minister DK Shivakumar on Wednesday.

Bengaluru is the co-lead of the Global Air Quality Network for the C40 Cities global network, comprising nearly 100 mayors from the world's leading cities who have come together to confront the climate crisis. Other Indian cities are Mumbai, Delhi, Kolkata, Chennai, and Ahmedabad.

BBMP's role
On Wednesday, Shivakumar, also the Bengaluru Development Minister, reviewed the draft action plan and is said to have suggested some minor changes. The plan is likely to be

launched in a couple of weeks as two other cities have already launched the programme. Out of 269 actions, the BBMP will be the 'primary' responsible agency for about 143 actions.

The World Resource Institute (WRI), a global consultant, came up with 269 actions across seven sectors such as stationary energy and buildings, transportation, solid waste management, air quality, water, urban planning, greening & biodiversity as well as disaster management. The draft was reportedly finalised after consulting different departments and non-profit organisations.

The objective of the Bengaluru Climate Action Plan, officials said, is aimed at mitigating Greenhouse Gas (GHG) emissions from the city and building resilience against climate change-induced hazards.

As a part of the programme, WRI has prepared a city-level GHG inventory for 2019 (base year), analysed climate data of 30 years, and studied extensive geospatial data to assess hazards, vulnerabilities and risks.

Some of the climate and environmental hazards identified for Bengaluru are urban heat, urban flooding, droughts, thunderstorms and lightning as well as air pollution. Among the actions include institutional



B'lu'ru's climate resilience blueprint

Environmental hazards

- Urban heat
- Urban flooding
- Droughts
- Thunderstorms and lightning
- Air pollution

Recommended actions

- Establishing institutional mechanisms and capacities
- Developing resilient infrastructure
- Enhancing data systems
- Securing finance mechanisms
- Strengthening governance and regulatory frameworks

mechanisms and capacity, infrastructure, data systems, finance, governance and regulatory mechanisms etc.

Quezon City, the Philippines

AIR QUALITY AND HEALTH IMPLICATIONS OF THE QUEZON CITY ENHANCED LOCAL CLIMATE CHANGE ACTION PLAN (2021-2050)

Images: Night view of a monument, Day view of a busy street with a cyclist.

C40 Air Quality Programme March 2024

C40 CITIES

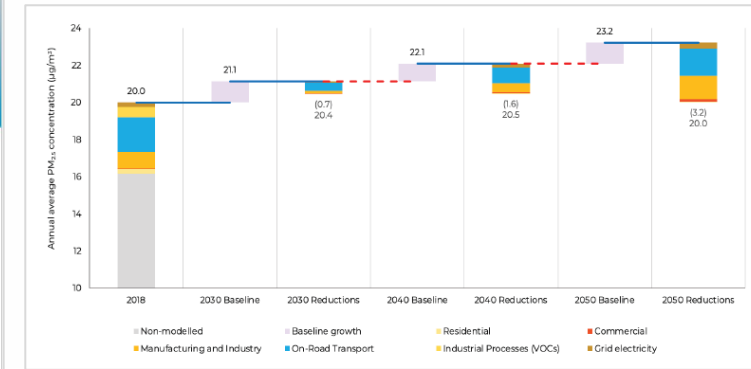
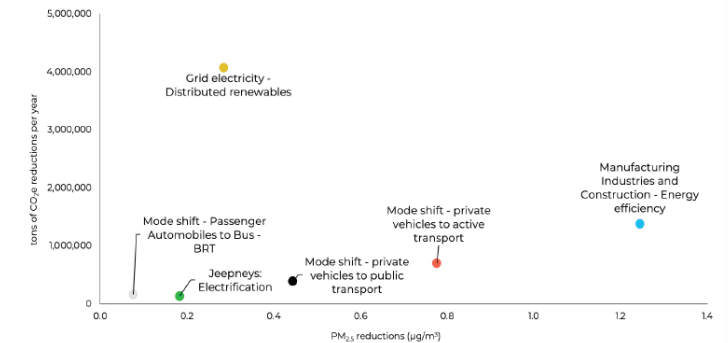


Figure 9. Change in PM_{2.5} concentration per action for the Ambitious Action Scenario.



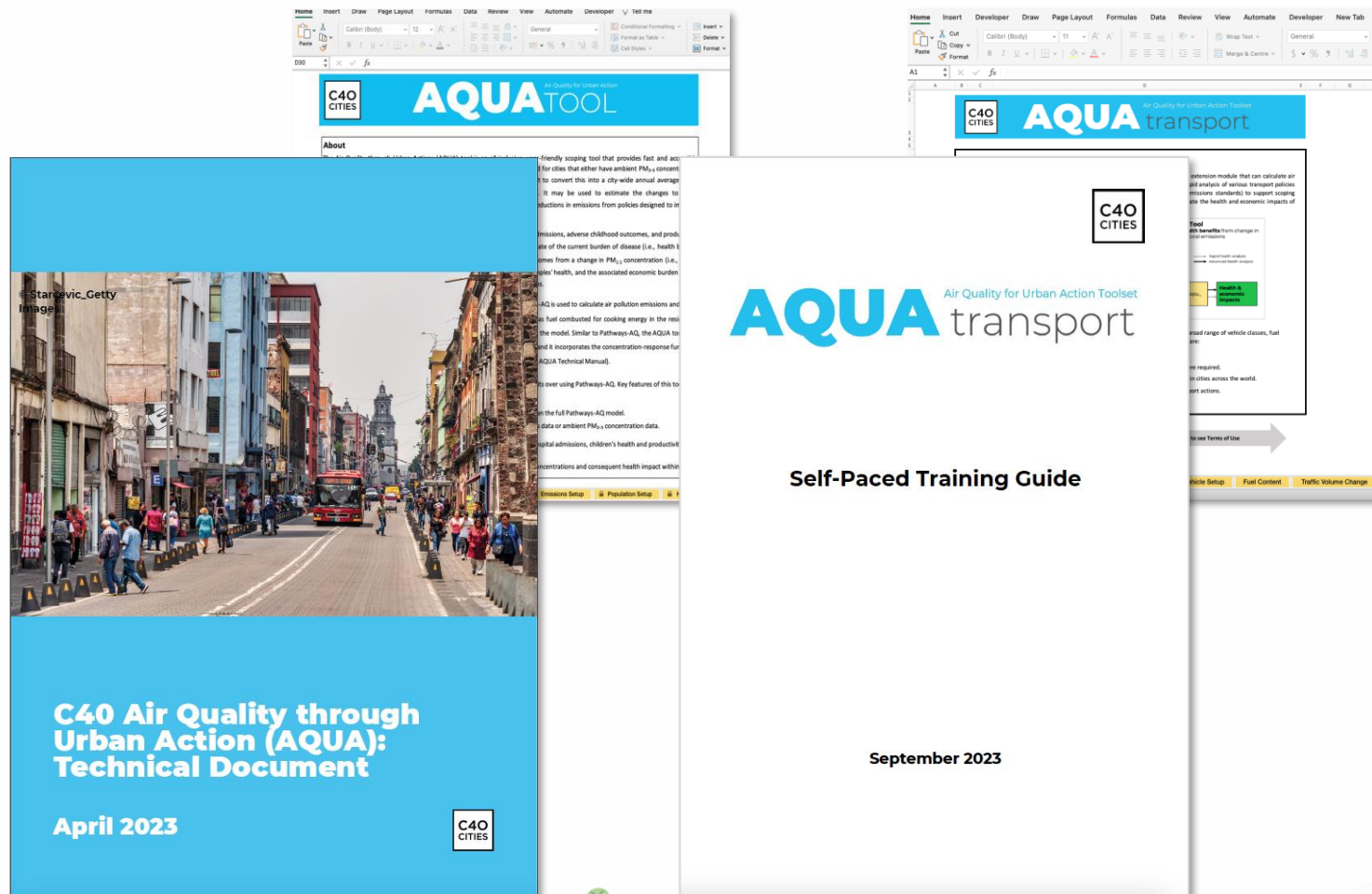
Tool 3: AQUA toolset

Rapid scoping tool to ease integration of climate, air quality, and health into decision-making processes

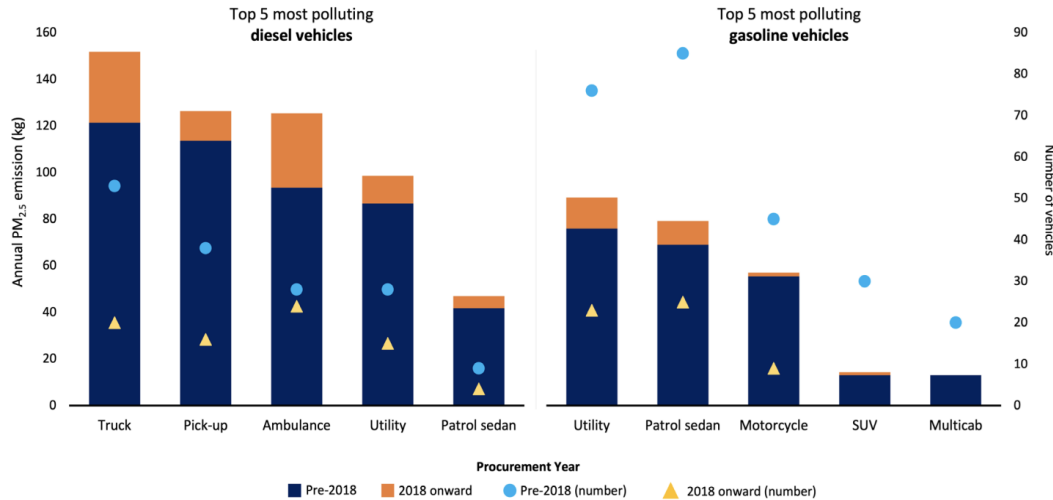
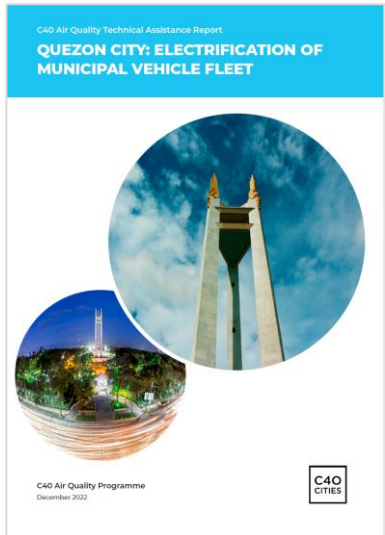
Air Quality through Urban Actions (AQUA) toolset

- To estimate air quality, climate and health and economic benefits of policy interventions, especially in low data settings

AQUA Transport Module is designed to calculate emissions of **air pollutants and greenhouse gas** from road transport.



Quezon City, Philippines: City fleet electrification



Driving action:

- Bring financial support
- Ensure clean power
- Inspire behavioral change

Scenario 3: Electrifying all active municipal vehicles in 2030

AIR QUALITY & CLIMATE IMPACT

27% reduction in GHG emissions

79% reduction in PM_{2.5} emissions

1,536 tonnes reduction in CO₂e emissions.

100% reduction in NO_x emissions

0.7 and 34 tonnes reduction in total PM_{2.5} and NO_x emissions, respectively.

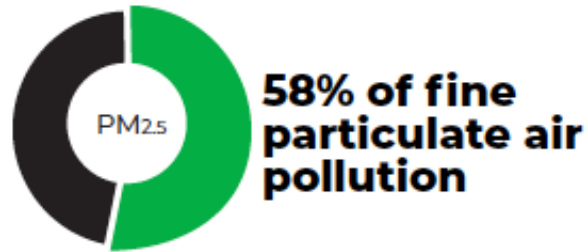
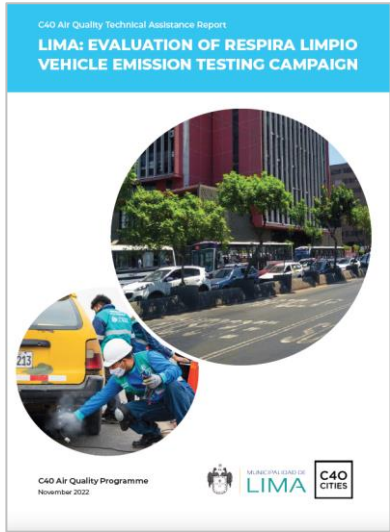
HEALTH ECONOMIC IMPACT

93% savings from health costs

₱1.8 million health costs avoided per year.



Lima, Peru: Vehicular Emission Testing Campaign



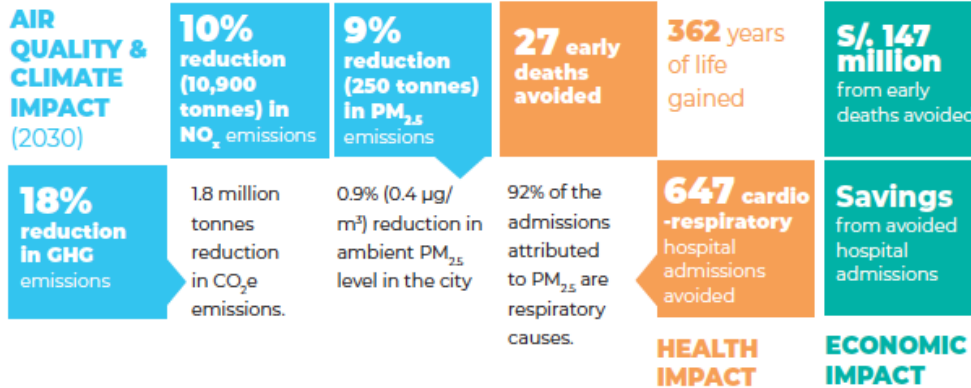
Driving action:

- Insert in the political agenda
- Work with strategic allies
- Engage with citizens
- Inspire behavioral change

Scenario 3: Entire vehicle fleet in Lima meets the LMP (100% compliance as compared to 4.2% compliance in baseline scenario)



* Generating **S/. 168,000** in tax revenue from M15 penalty.





Vivian Pun

Technical Head of Breathe Cities, C40 Cities

vpun@c40.org

