CITIES FORUM
CLEAN AIR AND CLIMATE SOLUTIONS
FROM CITIES, FOR CITIES
Ms. Fu Lu
China Director, Clean Air Asia
Background: The report addresses the need for solutions based on government data

- Policy development and improvement require as much data as possible, but governments are also keen on the use of official information especially in air quality assessments which can have legal implications
- The study covers data from 2011-2022, from reports by government agencies from 49 countries and more than 800 cities in the 4 sub-regions in Asia

Cities and megacities exceeding the WHO AQG should take urgent actions. Air quality improvement must be a continuous goal especially in countries far from the WHO AQGs.
99.8% of Asian cities are at risk from the health impacts of PM$_{2.5}$ exposure

Only 2 of the 849 cities met the PM$_{2.5}$ WHO AQG (2021)

- 2 of the 557 cities in East Asia
- 46 cities were able to meet the 2005 WHO AQG, majority from East Asia.
- Majority of Asian cities (esp. East and SEA) are within WHO IT-2.
- South Asian cities are mostly below the WHO IT-2, with majority of cities even below the WHO IT-1.

Asian cities must continue to strive for better air quality, especially those with cities that are far from the 2021 WHO AQG.

*Only covers cities with publicly accessible official government data*
Countries have yet to meet the 2021 WHO AQG, but Myanmar aims to meet the 2005 WHO AQG

Majority of countries have AQ standards aiming to meet the WHO IT-3 (14 countries) and WHO IT-2 (10 countries)

*Based on data accessed as of November 2023
Distribution map of annual PM$_{2.5}$ in Asia

*Only covers cities with publicly accessible official government data*
Air pollution in Asia’s megacities

All Asian megacities have annual PM$_{2.5}$ exceeding the WHO AQG 2021 and 2005, except Tokyo
• 8 out of 19 megacities are also beyond the WHO IT-1

Megacities are defined as cities with more than 10 million inhabitants.


*Used 2019 data for Jakarta; Osaka and Istanbul were not included since PM$_{2.5}$ data were not accessed
Ms. Milag San-Jose Ballesteros
Regional Director for East, Southeast Asia, and Oceania for C40
Mayor Jeevan Khatri  
Mayor of Changunarayan Municipality of Kathmandu Valley, Nepal
Mayor Ma. Josefina Belmonte
Mayor of Quezon City, Philippines
Mr. Decky Priambodo Koesrindartono

Head of Planning Agency of Tangerang City, Indonesia
CITIES FORUM
CLEAN AIR AND CLIMATE SOLUTIONS FROM CITIES, FOR CITIES
Ms. Xie Jinkai
Deputy Director of the Air Division of Beijing’s Municipal Ecology and Environmental Bureau
AIR POLLUTION CONTROL IN BEIJING

BEIJING MUNICIPAL ECOLOGY AND ENVIRONMENT BUREAU
Air quality significantly improved along with the rapid development of economy

<table>
<thead>
<tr>
<th>Year</th>
<th>CO2</th>
<th>SO2</th>
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<th>PM10</th>
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16 Stages' Air Pollution Control Measures (1998-2012)


battle to prevent and control pollution (yearly)
Source apportionment of PM$_{2.5}$

- Complete three rounds of PM2.5 source apportionment
- Main source: motor vehicle, coal burning, industrial production, dust, domestic pollution, others


**PM2.5 source apportionment**
### Targeted Measures for Different Pollution Sources


<table>
<thead>
<tr>
<th>Measure</th>
<th>Contribution (% of Total Emission Reduction)</th>
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<tr>
<td>Boiler renovation</td>
<td>29</td>
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<td>Clean household fuels</td>
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<tr>
<td>Industrial structure adjustment</td>
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<td>Dust control</td>
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<td>Mobile source emission control</td>
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</table>

**PM$_{2.5}$** (ug/m$^3$):

- **2013:** 90 ug/m$^3$
- **2017:** 58 ug/m$^3$

From 2013 to 2017, comprehensive boiler renovation and clean household fuels were the main contributors to the reduction of PM$_{2.5}$ concentration, contributing 55% of the total emission reduction. By now, a total of 28,000 MW(megawatt) of coal-fired boilers were renovated, and basically achieved the elimination of coal-fired boilers. Beijing completed “coal-to-gas” and “coal-to-electricity” transformation in over 1.3 million households and realized coal-free in plain areas.


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</table>

**PM$_{2.5}$** (ug/m$^3$):

- **2018:** 58 ug/m$^3$
- **2020:** 33 ug/m$^3$

From 2018 to 2021, mobile source emission control and dust source comprehensive treatment became the main contributors to PM$_{2.5}$ concentration improvement, accounting for a total of 54% of the total emission reduction. We took special measures to control high-emission vehicles and non-road mobile machineries. A total of 2.3 million old vehicles were obsoleted, and the amount of new energy vehicles comes to 720,000.
Regional Coordination

- Surrounded by mountains on three sides, Beijing is easily affected by pollutants transmitted from the south. The total amount of pollution emissions in the surrounding areas of Beijing-Tianjin-Hebei Region is large, which requires coordinated air pollution control mechanism in Beijing-Tianjin-Hebei Region and surrounding areas.

- **Establish Mechanism:** establishment of the Steering Group for Coordinated Prevention and Control of Air Pollution in Beijing-Tianjin-Hebei and Surrounding Areas.

- **Unified emergency response:** establishment of a joint consultation platform for regional air pollution early warning, unifying heavy pollution emergency classification standard.

- **Unified legislation:** Beijing-Tianjin-Hebei jointly issued Regulations on Pollution Control of Motor Vehicles and Off-Road Mobile Machinery Emissions.
Ms. Luu Thanh Chi
Deputy Director of Hanoi Environmental Protection Agency in Vietnam
COLLECTIVE ACTIONS TO CONTROL OPEN BURNING IN HANOI
Current State of RSOB in Hanoi

- Total rice cultivation area: 67,000 hectares (20% Hanoi’s total area); Total rice yields: 428,000 tons
- Straw burning: twice a year (May - June; October - November)
- Top reasons for burning:
  - Make the field easier to plow
  - Clear the field quickly for the next crop
  - Use the ash for fertilizer
  - Cannot find anyone to collect/buy the straw

* VCAP’s findings from surveying farmers
* Hoang Anh Le et al. 2020. Emission inventory from RSOB in Hanoi
CHALLENGES

Government coordination:
• weak coordination and overlapping administration, no responsible party
• RSOB is not considered as a serious environmental issue and not give priority in budget and regulations

Local farmers and communities:
• Hard to change habits
• Farming are diverse and small-scale requiring diverse solutions
• Lack of alternatives and incentives
• Lack of training and pilot/good examples

OPPORTUNITIES

Air pollution becomes visible
• Public concerns in “hot-spot” areas: near national highway and airport
• Local communes/districts are seeking, piloting and adapting different solutions

Connections and networks in clean air, including scientists, business and government agencies
Solutions to stop RSOB

Policies

• National policies on agricultural waste and greenhouse gases
• Hanoi People’s Committee published **Decree** set the goal that open burning of straw, agricultural residues, and waste will be eliminated in Hanoi
• Regulations on penalties for RSOB and solid waste
Solutions to stop RSOB

From Policies to Communication, alternative solutions

2020  ➡️  2021

PM2.5 DISPERSION FROM RSOB - SPRING 2020 – 2021
(Source: Hoàng Anh Lê et al, 2021)
Solutions

1. **Monitoring:** Scientists - Satellite and field research

2. **Technical**
   1. EM Compost
   2. Biofuel: straw-bale
   3. Combined big-scale compost and biofuel
   4. Zero or minimum tillage
   5. Grow mushroom
   6. Use as animal feed
   7. Use as animal bedding
   8. Make handicrafts

3. **Multi-Stakeholder engagement**

   *It is required participation, process and patience*
Results

Emissions from RSOB reduced

• 2020: 39%
• 2021: 23.4%
• 2022: 11.5%
Ms. Hoang Thu Hong

Head of Propaganda Department of Hanoi’s Women’s Association in Vietnam
ROLE OF HANOI WOMEN’S UNION IN COMMUNITY-ORIENTED ACTIVITIES TO RESOLVE THE BURNING OF AGRICULTURAL STRAW
OBJECTIVE AND KEY RESULTS

In June 2022: Hanoi People Committee approve the Project "Promoting the role of Women's Unions at all levels in building new rural areas and civilized urban areas by 2025"

The model "Women participating in post-harvest straw processing" is implemented by Hanoi Women Union.

- Raising awareness and promote women’s participatory in reducing straw-open burning and air pollution
- 5,400 women join in, 180 local women groups, 100% district
EXPERIENCE #1: PILOTING BEFORE LARGE-SCALE UP

- Implement the small-scale pilot projects rather than implementing on a large scale
EXPERIENCE #2: MULTI-STAKEHOLDER ENGAGEMENT
local government agencies, mass organizations, communities, scientist, NGOs, business

- Introducing diverse solutions
- Technical support, community-based support
STAKEHOLDER AND ROLES

Government (city, district, communes, farmer association, etc)
- Local planning
- Training and communication
- Implement and monitor action plans to control OB

NGOs, dev partners
- Connecting stakeholders
- Pilot and facilitate diverse solutions
- Support communications
- Communication

Private sector
- Provide technical solutions

Local community groups
- Take initiatives
- Community participation
HANOI WOMEN’S UNION

Connecting with NGOs and over 10 businesses to rural districts

Straw rolling and collection
Mushroom farming
EM composting

NGOs

LIVE & LEARN
For Environment and Community

BAQ 2023
15–17 NOV. MANILA
Connecting multi-actors, -sectors and -levels

Agriculture and environment sectors

City, districts agencies, scientists, NGOs engagement: frequently updating, guiding and monitoring
EXPERIENCE #3: DISCUSSION, EVALUATION AND SCALE-UP

- Continuously engage in discussions, scientific based evaluation
- Regularly discuss the implementation process, results, problems, difficulties (if any), handling experiences or new practical solutions during the implementation process
Mr. Davit Aslanishvili
Project Manager of Tblisi Transport and Urban Development Agency of Georgia
EFFORTS OF TBILISI TO TACKLE AIR POLLUTION
Facts

Tbilisi - the capital of the country of Georgia.
Population: 1.114 million (2016)

Figure 1 - Mobility rate in different cities
Source: Systra, 2016
Major Causes of Air Pollution

- Traffic: 16.2%
- Emissions from the buildings: 17.5%
- Industries: 24.2%

- Traffic:
  - Car: 29.7%
  - Taxi: 2.8%
  - Bicycle: 0.1%
  - Public Transport: 39.1%
  - Metro: 7.4%
  - Local Bus: 15.3%
  - Minibus: 16.4%
  - Other: 1.3%
How Does Tbilisi Address this problem?

- National Climate Strategy
- Tbilisi Resilience Strategy
- Green Cities Action Plan
- LUMP
- SUMP (Funded by ADB)
## Targets from SUMP (Funded by ADB)

### Pillars

<table>
<thead>
<tr>
<th>#1</th>
<th>Effective and efficient mobility system with improved access</th>
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<tr>
<td>#2</td>
<td>Safe &amp; accessible mobility system for all</td>
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<tr>
<td>#3</td>
<td>Enhanced quality of urban life and environment</td>
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### Strategic Goals

<table>
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<tr>
<th>#1</th>
<th>Reduce car dependency in favour of more sustainable transport modes</th>
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<td>#2</td>
<td>Improve accessibility and connectivity at city and regional level</td>
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<td>#3</td>
<td>Improve the efficiency and level of service in the mobility system</td>
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### List of Selected Indicators

<table>
<thead>
<tr>
<th>#1</th>
<th>Sustainable/Active Travel modal share (public transport / cycling / walking)</th>
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<tr>
<td>#2</td>
<td>Share of people with appropriate access to high quality public transport station or line</td>
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<td>#3</td>
<td>Improvement in public transport average commercial speed (for commuter rail, metro, BRT, buses)</td>
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<td>#4</td>
<td>Accessibility of public transport for mobility-impaired groups</td>
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<td>#5</td>
<td>Reduction in road deaths</td>
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<td>#6</td>
<td>Urban functional diversity</td>
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<td>#7</td>
<td>Ambient noise levels and air quality at key locations</td>
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**Graph:**

- **Modal Share (%)**
  - **Public Transport:** 39.1% (2016), 43.0% (2043)
  - **Walk:** 26.9% (2016), 27.0% (2043)
  - **Car:** 29.7% (2016), 20.0% (2043)
  - **Bicycle:** 8.0% (2016), 0.1% (2043)
  - **Taxi:** 2.9% (2016), 2.0% (2043)
  - **Other:** 1.4% (2016), 0.0% (2043)

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**Logo:**

- **BAQ**
  - **Better Air Quality Conference**
  - **15-17 Nov, Manila**
  - **Clean Air Asia**
  - **ADB**
  - **Climate & Clean Air Coalition Partnership**
  - **UNEP Regional Office**
Dr. K. S. Jayachandran
Special Secretary, Department of Environment,
Government of National Capital Territory of Delhi
and Member Secretary, Delhi Pollution Control Board
DELHI’S ACTION TO CONTROL CONSTRUCTION DUST
Development of extensive C&D waste processing facilities

- C&D waste generation approx. 6000 TPD in Delhi.
- Four operational C&D waste processing facilities in Delhi with total capacity of 3150 TPD
- Gap: 2850 TPD
Deployment of **233 anti-smog** gun at large construction sites.

- Dust mitigation measures issued to all project proponents, contractors
- Major awareness campaign- IEC
- Deployment of adequate numbers of anti-smog guns, in proportion to the area of the construction sites.
- Increasing awareness in construction industry-knowledge, manuals, template
- Embedding clean construction practices in contracts.
Web based monitoring mechanism

Dust pollution Control for Self-assessment web portal for C&D sites

- Self-registration of sites more than 500 sq.m mandatory
- Video fencing and Air Quality sensors.
- DPCC: Capacity building of all stakeholder departments on registration and review of self-assessment reports followed by personal hearings to more than 400 PPs during April to June 2023
- Over 1000 projects registered
- Green Delhi app-lodging complaints linking building plans to C&D web portal/Comprehensive active dynamic database
591 Teams for ensuring compliance of dust control norms at construction sites, road dust control, etc during winter, 23. Average number of inspections = 10,000/month.

- Construction sites
- Non-compliant C&D material transport vehicles
Graded Response Action Plan (GRAP)

- Graded Response Action Plan (GRAP) being implemented as Emergency Response System (ERS) (Since 2018)
- GRAP for NCR has now been classified under four different stages of adverse air quality in Delhi, reflected through the Air Quality Index (AQI).
- Proactively implement GRAP measures based on air quality forecasts, rather than retroactively implementing them once acceptable levels are breached.
- Measures under GRAP to be invoked at least two-three days in advance based on the prediction of air quality forecasting models.
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