



Expert Group Meeting on Innovative Technologies and Applications for Urban Air Pollution Control in Asia and the Pacific

25 May 2023, Thursday (Virtual)

Organized by:

Asian and Pacific Centre for Transfer of Technology (APCTT) of the
United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)

Meeting Report

A. Summary of discussions

1. The Expert Group Meeting on **Innovative Technologies and Applications for Urban Air Pollution Control in Asia and the Pacific**, organized by APCTT, brought together 20 participants from 8 member States of Economic and Social Commission for Asia and the Pacific (ESCAP), namely Bangladesh, China, India, Nepal, Philippines, Singapore, Thailand and Uzbekistan. The participants included APCTT's national focal points, policymakers, technical experts and relevant stakeholders involved in city air pollution control in the Asia-Pacific region.
2. The EGM was held to complement the activities of APCTT's ongoing project titled "Enhanced capabilities to adopt innovative technologies for city air pollution control in select countries of the Asia-Pacific".
3. The EGM provided a platform for member States to share and deliberate on good cases and examples of innovative air pollution control technologies being implemented in cities in the participating countries. Some of the key technologies discussed are
 - **China** - Anaerobic fermentation and biogas plants
 - **Bangladesh** - Zig-zag technology for brick kilns, gas-based power station including industrial generator
 - **India** - Pulsed Wi-Fi based air purification system, positive ionization based smog tower, building construction dust mitigation using low-powered air filters, road dust control using backpack mechanized street sweepers, filter based automatic air purification system / smog tower, street side filter based air filtration unit, vehicle mounted filter based air filtration unit, Utpavitra - a filter less anti-smog air purifying tower, wind augmentation purifying unit, 6 stage ACE+ air purification technology, virtual chimney for traffic junction, truck mounted road washer & sprinkler system, vehicle mounted misting machine (mist cannon), DG set end pipe solution, carbon cutter machine
 - **Philippines** - Vehicle mounted detachable air purification unit low-cost air quality sensors and air filters such as aluminosilicate technology for air purification

- **Thailand** - Continuous emission monitoring system (CEMs) for factories, diesel particulate filter (DPF) for vehicles
4. Relevant air pollution control technologies shared by representatives of member States and experts would be reviewed and considered for inclusion in a 'compendium of air pollution control technologies' which is currently being developed under the ongoing project.
 5. It was highlighted that there has been lack of comprehensive investigations of exposure to particulate matter (particularly PM_{2.5}) in transport microenvironments (TMEs) in Asian cities, especially during active modes of transport. It is an important area of study to help identify, assess, and select appropriate technology interventions and strategies to control air pollution in cities. Key determinants in this regard are time of exposure, place of exposure, and degree of exposure.
 6. Air pollution from brick kilns has been a major challenge in Bangladesh, particularly in Dhaka. The government has enacted appropriate laws and regulations to control air pollution from brick kilns by restricting clay-fired brick kilns and promoting environment-friendly alternative building materials including blocks.
 7. Bangladesh is also making several technological interventions to control air pollution. These are: phasing out of lead from gasoline, gas-based power generation, zig-zag technology for brick kilns, low sulfur containing coal, non-fired building blocks, improved cook stoves, solar and energy efficient technologies, metro rail service, Bus Rapid Transit (BRT), compressed natural gas (CNG) vehicles, liquified petroleum gas (LPG) stoves, modernization of vehicle emission testing procedure, improve traffic management system, green technology to achieve energy efficiency in industry, and improved waste management practices.
 8. Low-cost sensors could be developed locally to detect levels of local pollution in specific situations depending unique driving conditions, fuel composition, local regulations, vehicle types and age, and vehicle density. A robust and extended network of sensors that are strategically located in urban areas can provide relevant data to generate air pollution concentration maps and dispersion models for air pollution forecasting.
 9. It is essential to promote and adopt technologies towards net zero emission through a cross-cutting approach comprising of GHG emission reduction in different sectors with focus on energy and transportation, carbon capture, storage and utilization, nature-based solutions, and policy and regulations such as tax, incentives, credit and tariff, etc.

B. Recommendations

1. Key actions for improving city air quality should comprise of (1) removing high pollution and energy consumption industries, (2) carefully managing air pollution sources, and reducing energy consumption, (3) Improve laws and regulations framework, (4) fuel vehicles shift to clean energy vehicles, (4) urban afforestation, (5) rational planning of urban industries with removal of high pollution and energy consumption units, and (6) strengthening air quality monitoring (AQM) network.
2. City action plans should adopt multiple technology interventions such as electric vehicles (EVs), charging stations for EVs, retrofitting particulate filters in diesel vehicles, usage of bioethanol,

adoption of zig-zag technology for brick kilns among others. There are also many new and innovative technologies being developed and experimented in the field.

3. It is essential to conduct evaluation of the air pollution control technologies for their efficiency (e.g., mass of dust removed per unit time), economy and suitability for local conditions, and identification of hotspots through sensors and then adopt site specific solutions.
4. APCTT can promote cross-border technology transfer in air pollution control and enhance regional cooperation to achieve existing regional and global commitments.