

REGIONAL CAPACITY BUILDING PROGRAMME ON AIR POLLUTION EMISSION INVENTORY FOR THE ASIA PACIFIC REGION

CONCEPT NOTE AND PROGRAMME OVERVIEW

BACKGROUND

The **Asia Pacific region continues to face significant air pollution challenges**, with high levels of fine particulate matter (PM_{2.5}), ground level ozone, and other pollutants affecting human health, ecosystems, and economic productivity.¹ While the contribution of each source may vary depending on location, fossil fuel emissions from coal burning for power and heat, transport, industrial furnaces, brick kilns, agriculture, domestic solid fuel heating, and the unregulated burning of waste are considered the main sources of air pollution. The region also faces complex transboundary air pollution issues, such as seasonal haze, that require coordinated regional responses.

Addressing these challenges demands robust, science-based approaches, of which emission inventories are a cornerstone. Emission inventories provide a systematic, quantitative accounting of air pollutants released into the atmosphere from various sectors and sources. They play a vital role in identifying key emission sources, setting pollution reduction targets, tracking emission trends over time, and evaluating the effectiveness of mitigation policies. They also enable accurate air quality modeling and forecasting, which are essential for early warning systems, public health advisories, and long-term planning. Furthermore, emission inventories are critical for meeting international obligations under multilateral agreements, supporting national air quality action plans, and promoting regional cooperation to address shared challenges like transboundary air pollution and short-lived climate pollutants, including black carbon and methane.

Despite their importance, many countries in the region face technical, institutional, and data-related challenges in developing and maintaining comprehensive and high-quality emission inventories. These include limited availability of emission factors, fragmented data collection systems, lack of standardized methodologies, and inadequate capacity for data analysis and application.

This regional capacity building will contribute to responding to these needs, building on the outcomes of the UNEP-led Regional Workshop on National Air Pollutant Emissions Inventory, held on 23 September 2024 in Jakarta, Indonesia, and contribute to the United Nations Environment Assembly (UNEA) resolutions on air quality. The capacity building programme is being organized by UNEP in partnership with the Asian Institute of Technology (AIT), and with support from the Ministry of Environment of the Republic of Korea.

LEARNING OBJECTIVES

At the First Session of the UNEA in Nairobi in 2014, air quality was identified to be a priority issue requiring immediate action by the international community. This was reinforced with the adoption of a

¹ State of Global Air 2024.

new resolution at the Sixth Session of UNEA in 2024 on promoting regional cooperation on air pollution to improve air quality globally.² This resolution recognized air pollution as one of the greatest environmental risks to health and underscored the need to elevate efforts at all levels on addressing the significant impacts of air pollution, in line with the Sustainable Development Goals. The resolution also requested UNEP to “*form and facilitate a cooperation network on air quality*” to support, among others, “*capacity building for addressing air pollution including through mutual learning from inter alia available science, technical expertise and information.*”³ This regional capacity building programme seeks to strengthen institutional capabilities and support the development of a more effective, evidence-based air quality management tool across the region.

The capacity building programme has the following core objectives:

- 1) Enhance technical capacity in developing, managing, and applying emission inventories for air quality management.
- 2) Provide hands-on training and tools across key sectors (e.g., transport, industry, open burning of agricultural waste and forest fire).
- 3) Promote knowledge sharing and regional collaboration.
- 4) Introduce advanced topics including emission factors, quality assurance/quality control (QA/QC), and policy application of emission inventories.

FORMAT AND MODULE OVERVIEW

The programme will apply a learning approach which emphasizes problem-solving and self-directed learning based on each country’s priority sectors. The capacity building programme will deliver a structured curriculum combining theoretical learning, case studies, practical assignments, group discussions, interactive discussions, field-based exercises, and site visits. Training participants will receive reference and background materials, including the course modules and other reference documents, copy of PowerPoint presentations, and other relevant materials.

It will be conducted in English and will include:

1. **Orientation workshop** – introduction to key concepts and networking opportunities
2. **Online training workshop** – focus on foundational knowledge and introduction on emission calculation tools
3. **Onsite workshop in Pathum Thani, Thailand** – focus on hands-on training, field visits, consultations, and final presentations

² UNEP/EA.6/Res.10 Promoting regional cooperation on air pollution to improve air quality globally <https://documents.un.org/doc/undoc/gen/k24/008/31/pdf/k2400831.pdf>

³ UNEP/EA.6/Res.10 Promoting regional cooperation on air pollution to improve air quality globally <https://documents.un.org/doc/undoc/gen/k24/008/31/pdf/k2400831.pdf>

Figure 1. Capacity Building Programme Overview



Orientation workshop	
 4 th week of June 2025  Online  Delivered in English	 Focus: Introduction to the capacity building programme, introduction to key concepts, and networking opportunities
Online learning workshop	
 July 2025  Online  Delivered in English	 Modules covered: <ul style="list-style-type: none"> • Module 1: Introduction to Emission Inventories and EI Management • Module 2: Data Collection and Management • Module 3: Sectoral Emissions Estimation • Module 4: QA/QC in Emission Inventories • Module 5: Tools for Emission Inventory Development
In-person emissions inventory workshop	
 9-12 September 2025  Pathum Thani, Thailand  Delivered in English	 Training focus: Hands-on training, field visits, consultations, and final presentations by training participants  Modules covered: <ul style="list-style-type: none"> • Module 5: Tools for Emission Inventory Development (hands-on) • Module 6: Reporting and Policy Application

Figure 2. Capacity Building Programme Modules and Contents

Module 1. Introduction to Emission Inventories and EI Management <ul style="list-style-type: none"> • Concepts, scope, and significance • Roles of EI in air quality management • System design and management 	Module 4. QA/QC in Emission Inventories <ul style="list-style-type: none"> • Ensuring data quality and reliability • Verification and validation techniques
Module 2. Data Collection and Management <ul style="list-style-type: none"> • Activity data and emission factor sourcing • Surrogate data and proxies • Organizing large datasets 	Module 5. Tools for Emission Inventory Development <ul style="list-style-type: none"> • Available tools for EI development • Excel tool for emission estimation
Module 3. Sectoral Emissions Estimation <ul style="list-style-type: none"> • Sector-specific data and methodologies: transport, energy, open burning, forest fires, residential, waste, and industry 	Module 6. Reporting and Policy Application <ul style="list-style-type: none"> • Reporting to international frameworks • Policy design based on emissions data

TARGET PARTICIPANTS

The training programme is designed for mid- to senior-level professionals directly involved in air quality management, emission inventory development, or environmental data analysis at the national or sub-national level in developing Asian countries. The target participants are:

- Government officials from environmental ministries or agencies responsible for air quality management, emission reduction strategies, or reporting under international frameworks (e.g., the Ministry of Environment, Pollution Control Department, Environmental Protection Authority, etc.).
- Technical staff from national or local environmental authorities, particularly those working on data collection, emission estimation, inventory maintenance, or regulatory development.
- Researchers and academics from universities or public research institutions who are engaged in emission inventory research, air quality modeling, or policy advisory roles.

Participants should have a foundational understanding of air pollution issues and ideally be currently engaged in or planning to undertake emission inventory-related work in their home countries. Priority will be given to individuals who are able to apply the training outcomes directly to institutional or national initiatives and who can serve as resource person or trainers in their own contexts.

Interested candidates from the Asia Pacific Clean Air Partnership (APCAP) participating countries, members of the Thematic Working Group on Air Quality and Health, and the Acid Deposition Monitoring Network in East Asia (EANET) are encouraged to apply.

TIMELINE

- **1 May 2025:** Call for applications launched
- **30 May 2025:** Submission deadline for applications.
- **16 Jun 2025:** Selected training participants notified
- **4th week of Jun 2025:** Orientation Workshop
- **Jul 2025:** Online training on methodologies for key sectors (for selected cohort).
- **Aug 2025:** Data preparation and National EI development by participants.
- **9-12 Sep 2025:** Onsite workshop and presentation of preliminary EI (for selected cohort).

PROGRAMME DETAILS (tentative)

Schedule	Time/Format
Phase 1: Announcement of the training programme (1 May 2025)	
Submission of applications	30 May 2025
Announcement of the selected training cohort	16 June 2025
Online Orientation Workshop	4 th week June 2025
Phase 2: Emission Inventory development Training (July 2025)	Duration: 3 half-days Online
Content:	
- Module 1: Introduction to Emission Inventories and EI Management	15 July 2025
Module 2: Data Collection and Management	
- Module 3: Sectoral Emissions Estimation	22 July 2025
Module 4: QA/QC in Emission Inventories	
- Module 5: Tools for Emission Inventory Development	29 July 2025

Schedule	Time/Format
<p>Phase 3: Hands-on EI Development and Consultation (September 2025)</p>	<p>Duration: 4 days Onsite (Thailand)</p>
<p>Content:</p> <ul style="list-style-type: none"> - Module 5: Tools for Emission Inventory Development (Hands-on) - Module 6: Reporting and Policy Application Consultation Session - Field visits - Country Presentation Special seminar on indoor air quality management Certificate handling ceremony 	<p>9-12 September 2025</p>

ADDITIONAL INFORMATION

The course is free of charge. Participants who complete all modules and present their work will receive a Certificate of Completion issued by the Asian Institute of Technology.