

**ANNEX 4: TEMPLATE-C for PROJECT CONCEPT NOTE**

<b>Title of Project</b>	<p>Proposal Number: 2023-04</p> <p>Title: PM<sub>2.5</sub> source apportionment in major cities in EANET for recommendations on feasible reduction policy</p>
<b>Duration of Project</b>	January/2023 – December/2024
<b>Project Lead (PL)</b>	Network Center for EANET, Asia Center for Air Pollution Research
<b>Partner organizations (POs)</b>	<p>[List all relevant Partner organizations central to the project]</p> <ul style="list-style-type: none"> <li>➢ Pollution Control Department (PCD), the Ministry of Natural Resources and Environment (MONRE), Thailand</li> <li>➢ Sub Institute of Hydro Meteorology and Climate Change (SIHYMECC), Institute of Meteorology, Hydrology and Climate Change (IMHEN), Vietnam</li> <li>➢ Japan International Cooperation Agency (JICA)</li> </ul>
<b>Implementation Agencies (IAs)</b>	<p>[List all relevant Implementation Agencies]</p> <ul style="list-style-type: none"> <li>➢ Network Center for EANET, Asia Center for Air Pollution Research (NC/ACAP) (Japan)</li> </ul>
<b>Beneficiaries of PCs</b>	<ul style="list-style-type: none"> <li>➢ Policymakers</li> <li>➢ Scientists</li> <li>➢ National and local/city government officers</li> <li>➢ General public</li> </ul>
<b>Relevant Type of Activities</b>	<ul style="list-style-type: none"> <li>➢ Monitoring of acid deposition (acidifying species and related chemical substances such as ozone and PM) including an increase of EANET monitoring sites, improvement in monitoring methodologies and better instrument maintenance</li> <li>➢ Conduct an annual assessment of the state of acid deposition using trend analysis</li> </ul>
<b>Relevant Scope of EANET</b>	<ul style="list-style-type: none"> <li>➢ Monitoring of acid deposition including related chemical substances with quality assurance and quality control (QA/QC)</li> <li>➢ Promotion of capacity building</li> </ul>
<b>Representative of the Project Lead /Contact Address</b>	<ul style="list-style-type: none"> <li>➢ Dr. Keiichi Sato, Head, Atmospheric Research Department, the NC of EANET</li> <li>➢ Dr. Mingqun Huo, Senior Researcher, Atmospheric Research Department, the NC of EANET</li> <li>➢ Dr. Junichi Kurokawa, Principal Senior Researcher, Data Management Research Department, the NC of EANET</li> <li>➢ Dr. Yusuke Kiriyama, Senior Researcher, Data Management Research</li> </ul>

	<p>Department, the NC of EANET</p> <p>➤ Dr. Kim-Oanh Pham, Researcher, Data Management Research Department, the NC of EANET</p>
<p><b>Keywords of the project</b></p> <p><b>Summary of the project</b></p>	<p>PM2.5, Source analysis, Biomass burning, Vehicle emission, Secondary aerosol</p> <p>Many major cities in EANET participating countries suffer severe haze pollution due to rapid urbanization and motorization and biomass burning in forest and agricultural field. Our previous study of PM2.5 characterization in Bangkok demonstrated Organic Carbon Mass (OCM) accounted for 40% of total PM2.5. However, there are many unidentified sources of OCM, which becomes an obstacle for haze pollution mitigation.</p> <p>This study aims to assess PM2.5 source contributions using the data of organic substances and other components in PM2.5 collected in EANET participating countries. PM2.5 samples are collected in major cities in EANET, and the chemical components of PM2.5 such as ions, carbonaceous compounds, trace elements and organic markers will be analyzed. Regional and seasonal characteristics of the chemical components of PM2.5 will be clarified. Finally, PM2.5 source contributions is evaluated by the receptor models and the time profiles of the chemical components PM2.5.</p> <p>These results will provide scientific knowledge for PM2.5 pollution mitigation in Southeast Asian countries through outreach such as regional workshop.</p>

<p><b>Background and Rationale</b></p>	<p>Many large cities in East Asia, such as Bangkok and Ho Chi Minh City, suffer from severe air pollution caused by PM2.5. Since the chemical composition of air pollutants emitted from each air pollution source varies greatly depending on the source, information on the chemical composition is necessary for quantitative estimation of the source of PM2.5.</p> <p>Countries in Northeast Asia is industrialized and primary and secondary anthropogenic PM formation is dominant on regional air pollution. There are many researchers of characterization of PM component and source identifications in major cities in Northeast Asia. On the other hand, many major cities in Southeast Asian countries suffer severe haze pollution due to rapid urbanization and motorization and biomass burning in forest and agricultural field. The proponent and collaborators previously studied PM2.5 characterization in Bangkok. As a result, Organic Carbon Mass (OCM) accounted for 40% of total PM2.5. However, there are many unidentified sources of OCM, which becomes an obstacle for haze pollution mitigation</p>
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<b>Objectives</b>	<p>The objectives of this project consist of three parts. Specifically,</p> <ul style="list-style-type: none"> <li>➤ Elucidate regional and seasonal characteristics of PM2.5 component</li> <li>➤ Identification of major sources of PM2.5 in major cities in EANET</li> <li>➤ Transfer research outcomes to policy actions</li> </ul>
<b>Activities to achieve Objectives</b>	<ul style="list-style-type: none"> <li>➤ Observation and chemical analysis of PM2.5 components in Thailand, Japan, Vietnam and other major East Asian cities</li> <li>➤ Quantitative evaluation of PM2.5 sources by using PM chemical composition data and receptor models. Analysis of PM pollution structure in major East Asian cities by integrating the results of this source analysis with air quality models</li> <li>➤ Organizing a regional workshop for PM2.5 pollution mitigation in East Asia to conclude recommendations on feasible reduction of primary and secondary particulate matter.</li> </ul>
<b>Links and relevance to existing policy process of the target areas and regional activities</b>	<p>Since 2018, Japan-Thailand Clean Air Partnership (JTCAP) has been established based on the policy dialogue between the Ministry of the Environment of Japan (MOEJ) and the Ministry of Natural Resources and Environment of the Kingdom of Thailand (MONRE) as the joint project of countermeasure for severe air pollution caused by PM2.5 and other air pollutants in Thailand. JTCAP is implementing the following activities to mitigate the effects of air pollution caused by PM2.5 and other pollutants.</p> <ol style="list-style-type: none"> <li>(1) Identification of major source sectors and areas of PM2.5 by chemical transport model</li> <li>(2) Long-term observations and identification of major PM2.5 sources using receptor models</li> <li>(3) Formulate policies and appropriate measures by building relationships with stakeholders</li> </ol>
<b>Expected Outputs</b>	<ol style="list-style-type: none"> <li>(1) To clarify PM2.5 composition in specific season, which is important for source analysis in EANET region.</li> <li>(2) Receptor model analysis will show important source factors of biomass open burning, diesel vehicles, secondary inorganic particulate and industry</li> <li>(3) The obtained scientific knowledge will lead to recommendations on feasible reduction policy of PM2.5.</li> </ol>
<b>Expected Outcome</b>	<p>As a consequence of the proposed research, the following output regarding policy measure will be expected.</p> <ol style="list-style-type: none"> <li>(1) Finalizing the target of PM compositions for setting up reduction strategy and measures</li> <li>(2) Setting up proposed numerical targets of PM compositions for setting up reduction strategy and measures</li> </ol>