ADB

Completion Report

Project Number: 48059-001
Technical Assistance Number: 8701
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People's Republic of China: Study on the National Control of the Important Air Pollutant—Volatile Organic Compounds

Asian Development Bank

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<table>
<tr><td colspan="3">TA Number, Country, and Name:

TA 8701-PRC: Study on the National Control of the Important Air Pollutant—Volatile Organic Compounds</td><td colspan="2">Amount Approved: $400,000.00

Revised Amount: Not Applicable</td></tr>
<tr><td colspan="2">Executing Agency:
Ministry of Environmental Protection (MEP)</td><td>Source of Funding:
TASF–others</td><td>Amount Undisbursed:
$139,897.68</td><td>Amount Utilized:
$260,102.32</td></tr>
<tr><td>TA Approval Date:

18 August 2014</td><td>TA Signing Date:

9 September 2014</td><td>Fielding of First Consultant:

9 February 2015</td><td colspan="2">TA Completion Date
Original: 30 March 2016 Actual: 30 September 2016

Account Closing Date
Original: 30 June 2016 Actual: 31 December 2016</td></tr>
<tr><td colspan="5">Description
The policy advisory technical assistance (TA) aimed to fill a gap in scientific understanding of volatile organic compounds (VOCs)[1] pollution and the regulatory framework for their control. The TA reviewed the current status in the People's Republic of China (PRC) and international experience in VOCs management, and developed a management framework for the prevention and reduction of VOCs emissions in the PRC. The TA timely addressed an emerging and complex problem in the PRC where VOCs control is at its infancy. As in the typical learning curve for air pollution control, VOCs control becomes a priority once traditional air pollutants are reasonably understood and controlled. VOCs are precursors in ozone (O_3) formation, fine particles including particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), and other aerosols. O_3 and $PM_{2.5}$ are important causes of photochemical smog and particle pollution. Because of their great variety and chemical interactions with other pollutants, VOCs are much more difficult to control and require a more sophisticated and comprehensive regulatory system.

Air pollution emergencies are now a frequent occurrence in many cities throughout the PRC, leading to heightened concerns over public health. In response to the problem, the State Council promulgated the new Ambient Air Quality Standards in February 2012, which tightened concentration limits for major pollutants and included new standards for $PM_{2.5}$ and ground-level O_3. Recent modeling analysis suggests that some of the targets assigned by the Air Pollution Prevention Control Action Plan to specific regions, such as the Beijing–Tianjin–Hebei Region (BTH), will likely not be reached due to inadequate VOCs (and nitrogen dioxide) control targets. Indeed, compared with other traditional pollutants such as sulfur dioxide, nitrogen oxides, and particulate matter 10 micrometers or less in diameter, the VOCs control regulatory framework is poor.

Expected Impact, Outcome, and Outputs
The expected impact of the TA was improved air quality through effective VOCs emission control in the PRC. The expected outcome was improved management of VOCs emissions through the introduction of a new policy and regulatory framework in the PRC. A proposed strategy to improve the policy and regulatory framework, described in the TA final report, will be endorsed by the TA consultative committee and submitted to higher-level decision makers at MEP for consideration within 2017. The TA outputs were (i) a review of the current status in the PRC and international experience in VOCs management; (ii) a roadmap for establishing a management framework for the prevention and reduction of VOCs emissions, including an application to the petrochemical industry in the PRC; and (iii) a knowledge product summarizing the key findings.

Delivery of Inputs and Conduct of Activities
The TA was carried out by a consulting firm, with 6.0 person-months of international and 26.1 person-months of national consulting services. The performance of the consulting firm was generally satisfactory. The experts, selected from the excellence of the PRC's academia and the international community of VOCs pollution control practitioners, conducted a deep analysis of the VOC control contexts in the PRC and the United States (US) and provided recommendations for a systematic policy framework, underpinned by basic definitions, priorities, and institutional arrangements. Workshops were highly effective in terms of stakeholders (government, civil society organization, nongovernment organization, and community) participation and quality of inputs.</td></tr>
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[1] VOCs are organic chemicals with a high vapor pressure at ordinary room temperature, which are emitted when manufacturing and maintaining building materials, cleaning products, pharmaceuticals, and in the use of fossil fuels (e.g., gasoline). Many varieties of VOCs inflict direct harm on public health. Furthermore, VOCs can destroy or consume the ozone (O_3) in the stratosphere and can trigger global warming directly or indirectly as greenhouse gases.

At the start of the TA, MEP had published emission standards (including emission standards for VOCs) for the petrochemical industry. It was agreed that the TA would use the chemical pharmaceutical industry as a pilot to develop a management plan for VOCs. This change of scope was requested by MEP itself and approved by the Asian Development Bank (ADB). The expert engaged by the firm to represent the European Union's (EU) experience in VOCs management failed to complete his task and it was decided, given time constraints, not to replace him, given he had already provided a useful overview, albeit partial. This partly explains the undisbursed amount, which is otherwise attributable to lower than expected costs of studies and workshops (seminars).

The executing agency's performance was satisfactory. The executing agency provided counterpart staff, office space, and logistical support; and coordinated circulation of the TA reports, facilitated feedback and/or comments from various agencies and departments of MEP, and guided on quality and expectations for the TA outputs. ADB provided guidance and fielded timely missions for the inception, interim, and final reviews. ADB's overall performance was satisfactory.

Evaluation of Outputs and Achievement of Outcome

The outputs produced under the TA were accepted by ADB and MEP, including the inception, interim, and final reports. In line with MEP's requirement, the comprehensive final report reviewed the VOCs legal framework in the US, EU, and the PRC and suggested actions and recommendations to fill policy gaps. The TA review workshops built capacity, and awareness of (i) alarming levels of VOCs emissions, their sources in the PRC, and their contribution to haze episodes; (ii) technical and institutional gaps related to VOCs management in the PRC; and (iii) international VOCs management practices, from which parallels and lessons can be drawn for the PRC. The immediate outcome of the TA was achieved: the proposed management platform outline devised under the TA can strengthen the VOCs policy framework to improve air quality in the PRC. The government demonstrated strong ownership of the TA, and the relevance of the TA outputs and deliverables contributed to the achievement of the desired outcome through sharing of the final report among several MEP's departments, including (i) Environmental Monitoring, (ii) Science, Technology and Standards, and (iii) Air Environmental Management. Recommendations from the TA will also be incorporated in the Emission Standard of Air Pollutants for Pharmaceutical Industry and Feasible Technology Guide for Pollution Control in Pharmaceutical Industry.

Overall Assessment and Rating

The TA is rated successful. All required outputs and outcome, as well as related tasks and targets, were achieved. The executing agency was satisfied with the TA results. The proposed policy framework is practical and applicable to address the current constraints for improved VOCs control management in the PRC.

Major Lessons

ADB assistance came at an opportune time to support MEP in building internal capacity and regulatory tools to address the emerging VOCs problem. If left uncontrolled, increasing VOCs emissions may offset gains in ambient air quality improvement. Strong and high-level engagement of the beneficiary of the project, MEP, as well as industry associations, academia, and central and local government level stakeholders—who provided detailed comments and extensively engaged in discussions leading to the final recommendations—contributed to the quality of the outputs.

The change in the pilot demonstration sector is almost inevitable in a rapidly changing institutional environment in countries such as the PRC. In the future, pilot sectors should be chosen in closer consultation with the TA beneficiaries, anticipating that by the time ADB can kick-off the study, the original sector might have been addressed with counterpart funds. Other forms of knowledge assistance, i.e. policy briefs, are recommended for urgent support.

It is important to avail of the highest level of expertise and academic competence to conduct important studies such as in this TA. However, very senior experts are in high demand and often too busy to act as team leaders. Hence, it is suggested that top-notch experts are given roles other than the team leadership.

The TA leveraged multiple synergies with the East Asia Department's initiative in support for the air quality improvement program for the BTH Region. In the last part of its implementation, the TA was used to strengthen the VOCs control capacity of Hebei Province, in support of ADB's 2015 policy-based loan for Beijing–Tianjin–Hebei Air Quality Improvement-Hebei Policy Reforms Program. The TA also advertised ADB's 2016 Air Quality Improvement in the Greater Beijing–Tianjin–Hebei Region—China National Investment and Guaranty Corporation's Green Financing Platform Project as a possible vehicle to finance energy efficiency, retrofit, and cleaner technologies projects for reduced VOCs emissions from small and medium enterprises.

Recommendations and Follow-Up Actions

It is recommended to consider geographic and sector "hot spots" for VOCs emissions, identified by the TA report, for possible targeted ADB investment in the BTH.

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