

**NEASPEC Workshop on Transboundary Air Pollution in
North-East Asia
10-11 November 2011, Incheon, Republic of Korea**

REPORT OF THE MEETING

A. Attendance

1. The Workshop on Transboundary Air Pollution in North-East Asia was organized by the UN ESCAP Subregional Office for East and North-East Asia (NEASPEC Secretariat) and the Asian Development Bank (ADB) on 10-11 November 2011 in Incheon, Republic of Korea. The meeting was attended by more than 25 participants including national experts from China, Japan, Mongolia, Republic of Korea and the Russian Federation, ADB consultants and resources persons from the academia and the UN Economic Commission for Europe (Secretariat of the Convention on Long-Range Transboundary Air Pollution (CLRTAP)).

B. Opening Session

2. The Workshop was opened by Mr. Kilaparti Ramakrishna, Director of ESCAP Subregional Office for East and North-East Asia (SRO-ENEAS). In his statement, Mr. Ramakrishna noted that from the early days of the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC), established in 1993, transboundary air pollution has been identified as one of the top priorities by the member States. He further underlined that due to tremendous economic growth of the recent decades, the release of greenhouse gases (GHG) and air pollutants into atmosphere has soared dramatically in North-East Asia calling for joint multilateral actions to curb the emissions and reduce their adverse effects on human health and environment. He expressed his gratitude to the Asian Development Bank (ADB) for providing generous support to joint NEASPEC-ADB activities on mitigation of transboundary air pollution from coal fired power plants.

3. Mr. Sangmin Nam from the NEASPEC secretariat, introduced goals and objectives of the Workshop and provided background information on NEASPEC activities

in the field of transboundary air pollution. Specifically, he underscored the joint project with ADB on mitigation of sulphur emissions from coal-fired power plants in North-East Asia as one of the oldest projects under NEASPEC which contributed to development of emission control policies and technologies in China and Mongolia. He also provided a short summary of a new project on transboundary air pollution under NEASPEC, which was recently approved for implementation by the 16th Senior Officials Meeting (SOM-16) of NEASPEC (Seoul, 1-2 September, 2011).

C. Subregional and national progress in addressing SO₂ emissions

4. The session reviewed the progress and outcomes of the third phase of the joint NEASPEC-ADB project on mitigation of transboundary air pollution by coal-fired power plant in North-East Asia implemented during 2009-2011. In particular, the participations shared views and suggestions based on presentations made by the representatives of H & J Inc. – leading consultant for the project as well as local ADB consultants from Mongolia.

5. In the first presentation of the session Mr. James J. Qin from HJI Group provided overview of technical and policy issues for addressing national SO₂ emission regulations in North-East Asia. He noted that coal serves as a primary source of fuel for energy generation in China and Mongolia and in this context the cleaning of coal combustion processes becomes of utmost importance. Further, Mr. Qin introduced the most popular technical solutions for controlling SO₂ emissions at power plants in North-East Asia and globally, mentioning that wet-scrubbing Flue Gas Desulphurization (FGD) technology is the most popular choice, especially in China. On policy aspects of the issue, the presentation outlined the work of the project on providing support to China on increasing efficiency of existing FGD units and establishing new draft national standards for SO₂ and other pollutant emissions from power plants in Mongolia.

6. During his second presentation made on behalf of the China Electricity Council, Mr. Qin described national activities in China targeted at curbing SO₂ emissions. Particularly, he underlined the progress achieved during the 11th Five-Year Plan period and the plans for further actions during the 12th Five-Year Plan period announced recently by the Chinese Government. Important milestones that were achieved during 2006-2010 include the absolute reduction of SO₂ emissions in China by 14% and 29% reduction in the power sector which became possible thanks to leapfrogging steps in FGD installations at power plants – as of 2010- 86% of coal-fired power plants are equipped with FGD units. In addition, new tighter national emission standards are expected to enter into force in January 2012 which will lead the way to further reductions of SO₂ and NO_x emissions. Simultaneously, China is making efforts to improve its national air pollution monitoring network as was highlighted in the presentation by Mr. Shuai Wang, Chinese National Environmental Monitoring Center (CNEMC). Particularly, he mentioned that the network

has been enhancing both in terms of the coverage and technological capability to address the increasing concerns about urban air quality in some large Chinese cities. As future plans for the Center, Mr. Wang mentioned the intention to improve monitoring of such pollutants as PM_{2.5}, O₃, CO and VOCs in light of their adverse impacts on human health and the necessity to update the existing China Air Quality Index by adding new pollutants.

7. In the concluding presentation of the session, ADB national consultants from Mongolia provided the summary of outcomes of the project in their country. They specifically elaborated on the process of preparation and finalization of the new draft emission standards for coal-fired facilities in this country. Given that the current emissions standards are very lax and inadequate and in light of increasing public concern about growing air pollution in Ulaanbaatar (especially SO₂, NO_x and PM), the Government of Mongolia has long recognized the need to take firm actions on the issue. The draft standards that were prepared by the project consultants and went through a series of public consultations with diverse stakeholders in Mongolia will trigger adoption of much tighter standards by new facilities and gradual upgrade of older coal-fired installations. The draft standards already passed some stages of the government approval and are expected to be adopted in early 2012.

D. National and subregional strategies for co-benefits approach in North-East Asia with a particular focus on black carbon

8. The session discussed policy and technical measures to promote application of co-benefits approach in North-East Asia when air pollutants are mitigated simultaneously with greenhouse gases (GHG). In particular, the participants focused on discussing the role of black carbon (BC) and other short-lived climate forcers in the context of co-benefits. The participants underscored the importance of international cooperation to improve understanding of the physical and chemical characteristics of regional BC emissions, to investigate the impact of BC on health and climate and to assess the effects of mitigation policies.

9. ADB consultant Mr. Qin focused his presentation on possible strategies for applying co-benefits approach at coal-fired power plants. In this regard, he mentioned that by increasing the efficiencies of power plants both the air pollutants and GHG emissions are decreasing. Thus, the subregional member States should put effort to modernize their existing power plants and building new facilities with the state-of-the-art technologies, such as IGCC. He also highlighted opportunities for carbon capture technologies and carbon off-set approach by coupling fossil fuel power plants with renewable energy production (solar PV, concentrated solar thermal, etc). Mr. Lei Duan from Tsinghua University noted in this regard that one of the co-benefits of reducing SO₂ emissions at power plants in China was reduction of mercury emissions.

10. Mr. Fan Meng from Chinese Research Academy of Environmental Sciences (CRAES) presented research on modelling of black carbon emissions and their transport. Particularly, he noted that China accounts for more than 50% of black carbon emissions in Asia. In terms of breakdown of these emissions – biomass burning, industry and resident combustion of coal are the most contributing sectors, and thus should be addressed as priorities. The preliminary results of the CMAQ modelling for aerosols were presented to demonstrate the concentrations and transport of black carbon in China and North-East Asia. Finally, Mr. Meng mentioned the plans to enhance the model by updating the emissions inventories and including emissions from mobile sources.

11. Mr. Sang-Woo Kim from Seoul National University presented main outcomes of the Regional Assessment report on Atmospheric Brown Clouds (ABC) with focus on Asia. He outlined the main components of the ABC project including data collection, monitoring and integrated assessment of O₃ and BC. He further listed Beijing, Seoul, Shanghai and Shenzhen as ABC hotspots in North-East Asia which require special measures to tackle urban air pollution problems. Mr. Kim mentioned that further research is needed on health impacts of particulate matter and ground ozone effects on agriculture. He mentioned the establishment of the Policy Forum among the future plans of the ABC project.

12. The representative of the UNECE/CLRTAP secretariat Mr. Krzysztof Olendrzynski introduced technical and policy approaches to BC and other short-lived climate forcers within the CLRTAP Convention. In this regard, he informed the participants that the draft revised text of the Gothenburg Protocol, which includes provisions for BC as a component of particulate matter, will be submitted for consideration of the Executive Body of the Convention in December 2011. It is expected that the revised Protocol will include national emission ceilings for PM 2.5 and will stimulate the development and submission of national BC inventories by the Parties. Mr. Olendrzynski also summarized the long process of scientific research made by different task forces and working groups under the Convention that led to this proposed revision. He specifically noted that health impacts of PM were among the most decisive arguments during the negotiation process.

E. Mapping of current mechanisms of cooperation on TAP in North-East Asia and identification of potential synergies

13. The representative of the Scientific Research Institute for Atmospheric Air Protection (SRI Atmosphere) Ms. Kristina Volkova presented the main components of a new NEASPEC project on the “Review of existing and required capacities for addressing adverse environmental impact of transboundary air pollution in North-East Asia”. Particularly, she introduced the main objectives and scope of the project, time frame and proposed distribution of tasks between SRI Atmosphere, acting as the leading agency, and national consultants from other North-East Asian countries who will be supporting the

implementation of the project with their inputs. Taking into consideration a very tight schedule, she invited all participants to actively support the work of the project so that the overall project report to be submitted to the NEASPEC SOM-17 in 2012 would represent a collaborative effort of all NEASPEC member States and would lead to concrete follow-up activities on the subregional level.

14. Mr. Lim-Seok Chang from the National Institute of Environmental Research of the Republic of Korea made a presentation on the recent progress and outcomes of the Joint Research Project on Long-Range Transboundary Air Pollutants (LTP). He highlighted the key outcomes and decisions of the recent annual meeting of the project held in Pyeonchang, Republic of Korea on 8-9 November 2011. Specifically, he noted that during the 3rd stage of the project the research focused on monitoring and modeling of NO_x, PM and O₃ and shared the results of the joint work of Chinese, Japanese and Korean experts with the participants. He added that the meeting in Pyeonchang established a task force that will work on a future work plan of LTP following 2012. Among possible themes for this future work he mentioned air quality forecast for North-East Asia and implementation of advanced Source-Receptor methodologies.

15. Mr. Ken Yamashita from the Asia Center for Air Pollution Research presented the work and recent developments of the Acid Deposition Monitoring Network in East Asia (EANET). In particular, he provided the background of the establishment of EANET and introduced the institutional and scientific network of this mechanism. He further introduced the main parameters of the Instrument for Strengthening EANET that was adopted by the EANET countries in 2010 and is expected to go in force as of beginning 2012. Mr. Yamashita presented a vision of an integrated approach of air quality management in East Asia which would combine comprehensive assessment with policy measures. In this regard, he noted that mechanisms on transboundary air pollution in Asia should strive to go in the direction of adopting multi-pollutant multi-effect approach and integrated assessment methodology by taking inspiration from the CLRTAP in Europe.

16. In the concluding presentation of the session, the representative of UNECE/CLRTAP secretariat presented the recent results of the GAINS-ASIA model for China and GAINS-CITY model for Beijing and Jinan on behalf of IIASA. He underscored that integrated assessment models provide opportunity for identification of cost-effective control of air pollutants and GHG in Asia. Specifically, the GAINS-ASIA model for China provided the optimum emission reductions scenarios which can considerably reduce health impacts of such pollutants as PM 2.5 and achieve this in the most cost-effective way (cost reduction up to 80% compared to conventional approach). A similar message is expected to be deducted from the ongoing GAINS-CITY model for the most polluted cities in China which will facilitate adoption of the most effective and cost-optimized solutions by the concerned cities.

F. Summary of recommendations and outcomes of the discussion session

17. In the course of the meeting the participants expressed their comments and exchanged views on different aspects of managing air pollution in North-East Asia. Specifically, the audience provided recommendations and inputs for the themes covered in each session of the Workshop.

18. Regarding mitigation of transboundary air pollution from coal-fired power plants the Workshop welcomed the outcomes of the 3rd phase of the joint NEASPEC-ADB project and highlighted the recent achievements and efforts of member States in tackling this important issue. Specifically, the participants underlined the solid steps taken by the Chinese Government to achieve absolute reductions of SO₂ emissions and underscored the role of the project in drafting of new emissions standards for Mongolia. Taking into consideration the persistent role of coal as a primary fuel for energy sectors in China and Mongolia, the Workshop invited the countries of the subregion to further strengthen their efforts in reducing adverse impacts of emissions from coal combustion on the environment of the subregion. The Workshop also invited the secretariat to share widely the final report of the NEASPEC-ADB project with all relevant stakeholders to disseminate knowledge across North-East Asia.

19. Further, the Workshop recognized wide opportunities of tackling simultaneously air pollution and climate change issues inherent in co-benefits approach. Based on the presentations of various monitoring and modeling studies of BC and other short-lived climate forcers in Asia, the participants identified potential areas and sectors where mitigation actions should be targeted – especially residential sector, industry and agriculture. The Workshop further underlined the importance of conducting additional monitoring and modeling activities by using advance techniques (e.g. satellites) to better inform the policy-makers about the potential control measures to be taken both nationally and internationally. Many participants repeatedly highlighted the importance of conducting further research on effects of PM on health and O₃ on agricultural crops in North-East Asia. The existence of solid scientific data on these issues is also expected to boost political motivation for addressing the short-lived climate forcers not only for the sake of their effect on climate but also due to their adverse impacts as air pollutants. Moreover, the Workshop also considered the need for intercontinental cooperation on political level for tackling different issues of air pollution since many of the pollutants are capable of travelling across continents. In this sense, though a possible global convention can be seen as impractical or politically unacceptable for some actors, such cooperation can entail exchange of information, knowledge and recommendations between regions.

20. With regard to the new NEASPEC project on Review of existing and required capacities for addressing adverse environmental impact of transboundary air pollution in North-East Asia, the participants exchanged ideas on the priority issues to be addressed by

the project and on the modalities of the implementation of the project activities. Specifically, the participants noted that as the project outcomes should reflect the expectations of the member States, the role of the national focal points is crucial in identifying and conveying the specific national needs and expectations. Some participants also underlined that the project should come up with a set of possible options for further development of a framework on transboundary air pollution in North-East Asia (e.g. possible new subregional body, process and the role of NEASPEC).

21. The Workshop also noted that the review stage of the project is very important since it is expected to produce a snapshot of the existing cooperation and related mechanisms and identify potential synergies/complementarities between them as the countries of North-East Asia and East Asia already have experience in working together on transboundary air pollution (e.g. EANET, LTP, ABC, etc). The Workshop also underscored that the institutional and scientific framework of the CLRTAP can serve as a good model for North-East Asia and that the countries of the subregion should already seek cooperation with this pan-European mechanism based on the existing mechanisms and in light of CLRTAP outreach activities in Asia. Some participants reiterated that the project should look into a range of possible conclusions, especially in the context of the science-policy interface and study carefully the existing mechanisms as models and with a view of identifying room for improvement.

22. In the final discussion session moderated by the secretariat, the participants were asked to come up with their ideas and inputs regarding two questions, namely 1) what joint activities/frameworks do North-East Asian countries need to improve knowledge and policy capacities?; and 2) what impacts of air pollutants do North-East Asian countries need to jointly address? The results of this exercise are summarized in the tables below. It is expected that these recommendations and ideas would be used to further refine the goals and objectives of the new NEASPEC project to better address the current subregional needs and expectations.

Question 1: What joint activities/frameworks do North-East Asian countries need to improve knowledge and policy capacities?

Framework/policy related proposals	Proposals for joint activities
Strengthen science-policy link. Look into ways to attract interest of policy-makers.	Improve sharing of monitoring and emissions data in the subregion.
Aim at multi-pollutant, multi-effect, legally-binding, linked with other mechanisms framework. Establish global or interregional (intercontinental) cooperation framework.	Hold scientific workshops/conferences on different aspects of air pollution: emission, transport, deposition, effects, and policy and control technologies.
Establish scientific board of scientists (like	Hold joint public awareness and training

CLRTAP's EMEP Steering Body or Working Group on Effects); promote the further development of existing mechanisms in East Asia.	programmes. Provide advice on national legislation and effective measures to reduce air pollution.
Promote interaction between subregional and regional networks.	Hold joint studies on BC and ground-level ozone and other short-lived climate forcers.
Promote cooperation of various effects related working groups and air pollution groups.	Hold joint research on cost-effective control technologies. Evaluate efficiency of the existing pollution control technologies.
Establish joint international scientific programme/centre –extension/combination of existing EANET, LTP.	Explore options of co-benefits approach to tackle air pollutants and climate change together.

Question 2: What impacts of air pollutants do North-East Asian countries need to jointly address?

Air Pollutants/problems	Related impacts and/or proposed actions
PM 2.5	Share knowledge/conduct further studies on human health related effects. Share knowledge on benefits of emission reductions in terms of human health (higher life expectancy) for all pollutants.
Ground level ozone	Share knowledge/conduct further research on adverse effects on health, (semi) natural vegetation and agricultural crops. Inform policy-makers about the outcomes for ozone and other pollutants.
All	Establish task forces/working groups to study different health and environmental effects similar to CLRTAP approach (joint work with WHO, FAO and other agencies).
Persistent Organic Pollutants	Study health impacts.
Acid Deposition/Eutrophication	Study effects of acid deposition (S and N emissions) on ecosystems.
Dust and sandstorms	Study effects on human health (respiratory diseases) and agriculture.
