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ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC

**REPORT OF THE FINAL REVIEW MEETING OF THE REGIONAL  
PROJECT ON TECHNICAL ASSISTANCE FOR ENVIRONMENTAL  
COOPERATION IN NORTH-EAST ASIA**

**Bangkok, 20-22 May 1998**

## **I. ORGANIZATION OF THE MEETING**

1. The Final Review Meeting of the Regional Project on Technical Assistance for Environmental Cooperation in North-East Asia, organized by ESCAP and supported by the Asian Development Bank (ADB), was held in Bangkok from 20 to 22 May 1998.

### **A. Attendance**

2. The Meeting was attended by representatives of all six participating countries of the North-East Asian region, namely China, Democratic People's Republic of Korea, Japan, Mongolia, the Republic of Korea and the Russian Federation. The United Nations Environment Programme (UNEP) and ADB also participated in the Meeting.

### **B. Opening statements**

3. The Meeting was opened by the Deputy Executive Secretary and Officer-in-Charge, ESCAP. She expressed her gratitude to ADB for its support of the technical assistance project for environmental cooperation in North-East Asia and acknowledged the strong support ESCAP had received from the governments and institutions collaborating on the project. The Meeting was urged to keep in mind the major goals of the project, which were to promote clean coal technology and capacity-building for air quality management through environmental cooperation in the North-East Asian subregion. She noted that the participating countries had demonstrated a strong commitment to the goals of the project demonstrated by the hosting of two additional demonstration activities beyond the original scope of the project and the strong enthusiasm and willingness of member countries to host the proposed follow-on activities recommended in proposals for future projects. She requested, on behalf of all the participating international organizations and countries, the continued strong

support of ADB in funding the follow-up activities. As it was the Final Review Meeting, she invited Prodipto Ghosh of ADB to chair the Meeting.

4. In accepting the Chair of the Meeting, Prodipto Ghosh noted the importance and timely nature of the project as a result of the expanding use of coal in the region and the growth in associated environmental problems. The work of the initial phases of the project had now been completed and attention needed to be turned to a review and evaluation of those activities as well as a renewed focus on the scope and direction of future work in environmental cooperation in the subregion. It was noted that the technical assistance had been accomplished very efficiently and with high standards by ESCAP and he stressed that the success of the project was due in large part to the strong participation and cooperation of the participating countries in those matters. Mr. Ghosh stated that ADB was interested in the promotion of regional cooperation for environmental protection in the North-East Asian subregion and that the mechanisms and framework of the cooperation were in line with the strategic objectives of environmental protection and thematic priority of regional cooperation of the Bank. He stated that the Bank looked forward to the deliberations of the Final Review Meeting and its outcomes and that, if there were requests from the countries present at the Meeting, the Bank would seriously consider participation in follow-on projects and activities.

5. The ESCAP secretariat provided a summary of the overall background and focus of the project and the ongoing effort in subregional cooperation in North-East Asia. It was noted that the outcomes of the project had been effectively realized. The aims and objectives for the Meeting were described. They included the following:

- (a) To assess the completion, accomplishments and outcome of the three subprojects;

- (b) To assess the impact of the activities under the project in the promotion of clean coal technologies, environmental monitoring and environmental improvement in the individual countries;
- (c) To review, recommend and define the implementation of the follow-on activities for ongoing cooperation.

6. It was noted that discussions should lead to the formulation of the follow-on projects to continue to promote the objectives of the project on environmental cooperation in North-East Asia. A major objective of the Meeting was to discuss the ways and means of implementing those projects and the follow-up activities. It was hoped that the outcome of the Meeting and the issues discussed would be brought to the attention of the decisions makers in each of the countries, and the implementation of projects in each country would be brought to the attention of the donor organizations.

### **C. Adoption of the agenda**

6. The Meeting adopted the following agenda:
- 1. Opening of the Meeting.
  - 2. Election of officers.
  - 3. Adoption of the agenda.
  - 4. Evaluation of the regional project on technical assistance for environmental cooperation in North-East Asia:
    - (a) Subproject I: training for sulphur dioxide reduction in coal-fired power plants;
    - (b) Subproject II: demonstration of low-air pollution coal-fired power plant technology;

- (c) Subproject III: Environmental pollution-data collection, comparability and analysis.
5. Further cooperation in the promotion of clean coal technologies (country presentations).
  6. Follow-up projects:
    - (a) Regional technical assistance projects;
    - (b) Investment projects.
  7. Other matters.
  8. Adoption of the report.

## **II. EVALUATION OF THE REGIONAL PROJECT ON TECHNICAL ASSISTANCE FOR ENVIRONMENTAL COOPERATION IN NORTH-EAST ASIA**

(Item 4 of the agenda)

8. The Meeting considered document ENR/FRM.4, providing an overview and evaluation of the activities and recommendations of the completed activities of the three subprojects: I. Training for sulphur dioxide reduction in coal-fired power plants; II. Demonstration of low-air pollution coal-fired power plant technology; and III. Environmental pollution-data collection, comparability and analysis. The countries provided their perspectives on the impacts of those subprojects in terms of the development of training, capacity development and technology transfer, and the implementation of clean coal technology development in each country. The country delegates expressed strong support for the continuation of the programme as well as the desire that the follow-up projects would be adopted, particularly in terms of the training and capacity development issues.

9. The Meeting noted the linkages and important interactions between the three subprojects. Subproject I was useful in examining the common problems of coal-fired power stations in the subregion contributing to increased pollutant emissions and encouraged the exchange of information on techniques and practices to solve those problems. Subproject II was useful in providing information to participants from all countries and demonstrating the best available technology in each country for reducing the emissions of those pollutant substances. Subproject III focused on the measurement and analysis of the environmental impacts of those pollutant emissions and provided an opportunity for participants to exchange information on the monitoring of emissions and air quality in the subregion. Information regarding the comparability, availability and quality of environmental data among the countries of the region was exchanged.

10. The Meeting agreed that subprojects I and II had achieved their major objectives and had provided great benefit to the countries of the region in terms of flue gas desulphurization,  $\text{NO}_x$  and particulate removal technology development and implementation. In terms of follow-up activities on technical assistance and cooperation, the Meeting agreed that training and technology transfer were the most important aspects of future cooperation, especially in terms of coal-fired power plant operations, maintenance and upgrading of technology. Since the thermal power plants in many of the countries were ageing, the focus of cooperation should be on training for best practice operations and maintenance of the systems of those older plants combined with technology transfer to introduce new technologies to replace the ageing systems where appropriate.

11. The representative of China noted that “appropriate” technologies might not be the most efficient but that those technologies might be the best for the social and

economic conditions of different countries. China expressed the desire to make the best use of the existing systems by improving operation and maintenance (O&M) practices and by upgrading and retrofitting underperforming systems such as scrubbers and electrostatic precipitators. Further, as countries sought to extend the useful life of older coal-fired plants, there would be a strong need also to upgrade those existing anti-pollution systems to improve the capacity of the plant operators to conduct those upgrades and operate and maintain those systems to optimum performance levels. Appropriate clean coal technologies that were recommended included coal washing, duct injection flue gas desulphurization, new combustion technologies, for example fluidized bed combustion and low-NO<sub>x</sub> burners.

12. Recommendations for subproject I reviewed by the Meeting can be summarized into three categories: capacity- and institution-building, application of clean coal technologies, and financial and economic aspects. The exchange of information and experiences among power plant experts throughout North-East Asia as conducted by the project was deemed an example of the kind of technical cooperation which would build capacity in the subregion. The project provided an excellent opportunity to discuss issues of clean coal technologies and environmental management as they pertained to the various countries in North-East Asia.

13. Recommendations for subproject II reviewed by the Meeting fall into the following five categories, i.e. upgrading particulate matter removal capabilities, enhancing regional monitoring capabilities, promoting appropriate clean coal technologies, improving O&M at power plants, and developing institutions through specialized training.

14. The Meeting recognized that the capacity to reduce air pollution in the subregion would improve through increased awareness of and information exchange

on clean coal technologies. Additionally, the Meeting noted that institution-building could play a key role in developing capacity in the region and hence the Meeting recommended that a coal-fired power plant training centre should be established in the subregion in an existing research institution, with special consideration given to the endorsement of the concept of establishing the centre at the Korea Electric Power Research Institute (KEPRI), Republic of Korea, as approved by the Fourth Meeting of Senior Officials on Environmental Cooperation in North-East Asia in Moscow in January 1998.

15. Regarding the application of clean coal technologies, the participants recommended that systematic methods for the installation of new pollution abatement technologies should be developed to assist in power plant planning projects in the subregion. As a direct outgrowth of the activities of the project, Mongolia and China had entered into bilateral agreements and concluded a Memorandum of Understanding to cooperate on environmental programmes between the two countries. A Project had been developed for upgrading the electrostatic precipitator systems at Thermal Power Plant No. 4 in Ulaanbaatar, Mongolia, which had been damaged by recent explosions in the boilers. The agreement resulted in a visit by a Chinese delegation from Nanjing to Thermal Power Plant No. 4, and a technical reciprocal visit by a Mongolian delegation to the Nanjing Environmental Protection Institute was planned in the near future. Additionally, the Mongolian power plant operators had investigated the feasibility of reducing SO<sub>2</sub> and NO<sub>x</sub> emissions from the power plant and had purchased and installed German technology to accomplish that outcome.

16. While recognizing that differences might exist from country to country with respect to the minimum level of pollution abatement equipment that would be required for new power plants, the Meeting recommended that the principle of having

minimum standards for air pollution reduction for new plants should be incorporated into the air quality management practices of each country. Finally, a recommendation to identify alternative methods for domestic heating, such as the use of coal briquettes instead of plain coal or wood, was viewed as country-specific, with China and Mongolia appearing to be the principal beneficiaries of that form of technical assistance.

17. Rating to financial and economic aspects, the Meeting noted that the private sector could become more involved in pollution abatement projects in the subregion. Private companies which sold pollution abatement equipment had an interest in promoting their own products and such promotion often included favourable terms of sale in order that the company might established a foothold in a new market.

18. On the subject of training and institutional development, the Meeting held the view that training should be made available through a subregional training centre on the general topic of environmentally sound power generation, including air pollution abatement. The centre would encourage “technology transfer” by developing a subregional network of experts and expertise throughout North-East Asia. The delegation from the Republic of Korea made a presentation on that concept for the development of such a centre at KEPRI in the Republic of Korea. The proposal outlined the development of the centre, the development of a training manual for environmentally sound power generation, the development of training courses and related materials, and the outline for a detailed training programme that would be conducted at KEPRI and onsite at four power plant training sites located in different countries of the North-East Asian region.

19. With respect to training, the Meeting agreed the training programme of the centre should focus on the subjects of coal testing and combustion, pollution control,

power plant O&M, and advanced power generation and clean coal technologies. Such training would include relevant computer models, expert system evaluations, and effective O&M techniques for electrostatic precipitators. The training would be most effective if it were to involve all countries of the region and be held in locations in as many of the countries as possible.

20. In terms of the cost of the proposed centre, the project as proposed by the Republic of Korea delegation included in-kind contributions amounting to approximately US\$ 170,000 for the development of the centre, the training manual and the training course curriculum. To complete the project, additional funding would be necessary from donor agencies and countries to provide support for the training course participants and the project meetings. The generous proposal by the Republic of Korea delegation was welcomed.

21. To further the development of cooperation in training in coal-fired power plants, the delegation from Japan described a manual prepared by the Environment Agency of Japan which contained an inventory of pollution countermeasures for coal-fired power plants. Japan was committed to assisting in the capacity development and training of the countries of the region in environmentally sound coal-fired power plant operations and hence had offered to provide the manual for inclusion in the training course curriculum at the training centre.

22. The Meeting discussed the outcome of subproject III and reviewed the accomplishments in terms of subregional training and skills development, and institutional/network building. Subregional training was deemed an important aspect of regional cooperation and was necessary to promote the principles and operation of monitoring equipment and methodologies for use in monitoring stack emissions and for ambient air quality assessment. It was noted that the equipment and procedures

for monitoring varied greatly from country to country and a programme to encourage comparability was needed.

23. The Meeting agreed that the highest priority should be placed on the comparability of data and methodologies through a network. The workshop discussed in great detail the differences in information systems, including equipment and methodologies, among the countries of the region and the complexities of data transfer. It was agreed that despite those differences it was possible to design and conduct a successful project in data comparability and analysis and that the creation of a subregional centre would be a positive step in accomplishing the objectives of the project.

24. With regard to institutional/network building, the Meeting noted the recommendation endorsed by the Senior Officials in Moscow that a regional environment data centre should be established to coordinate comparability of monitoring equipment, analytical methods, calibration practices, sampling methods, and presentation and analysis of data. The centre would also coordinate the development of a network of ambient air quality monitoring stations for the subregion air quality monitoring network to facilitate inter-country comparability of the collected data. Finally, the Meeting agreed that the development of a project to deal with the comparability of emission inventory data through an agreed-upon methodology would be useful.

25. A further function of the centre would be to provide training on environmental data monitoring and comparability of analysis methodologies and techniques. The Meeting stressed that the training should be regionally focused and involved all countries of the subregion. Further, the project should strive to develop the capacity and equip national centres with appropriate comparable equipment so that systems of

information exchange might become more comparable among the countries of the region.

26. The delegation from Japan noted the particulars of the air quality management system of Japan, which was largely based at the local level. About 2,000 air quality monitoring stations were in operation in Japan. Japan also maintained a national air quality monitoring network, as well as acid deposition monitoring stations. The representatives expressed their readiness to become actively involved in the project for the development of a regional network for environmental monitoring. They expressed strong support for the implementation of a data clearinghouse at the National Institute for Environmental Research (NIER) in the Republic of Korea to promote close regional collaboration and information exchange on environmental monitoring in the region. Further, it was stressed that future developments needed to take into account the related subregional, regional and global efforts, including the acid deposition monitoring network in East Asia, the Korea-Japan-China joint modeling project, and the United Nations modeling project.

27. The Meeting noted the need to develop emission inventories in the region for pollutants of concern and recognized that activities to promote the development of those comparable inventories should be given a high priority. That could be accomplished by the development and promotion of projects to develop comparable methods for inventory development and emissions estimation, the hosting of regional meetings on emission inventory development, and developing projects to construct emission inventories. In the light of those needs, the Meeting recommended that those activities could be integrated into the function of regional centre for environmental data quality and analysis.

28. The Meeting was presented with a proposal by the delegation of the Republic of Korea for the development of a regional centre for environmental monitoring, data collection, comparability and analysis to be located at NIER in the Republic of Korea. The main elements of the proposal were similar in scope to the second proposal endorsed by the Senior Officials in Moscow in January 1998. As part of that effort, the representatives from the Republic of Korea proposed that the Republic of Korea should bear the cost of the clearinghouse under the project.

29. The Meeting also welcomed the offer of Japan to host the expert group meeting of the project on the development of emissions monitoring, estimation and inventories. In that connection, the delegation from Japan urged the ESCAP secretariat to seek participation costs for countries of North-East Asia and the secretariat. The other costs for the Meeting would be borne by the host country.

### **III. FURTHER COOPERATION IN THE PROMOTION OF CLEAN COAL TECHNOLOGIES (COUNTRY REPRESENTATIONS)**

(Item 5 of the agenda)

30. The Meeting considered document NR/FRM.5, which provided a framework for discussion of the subject of further cooperation in the promotion of clean coal technologies in the North-East Asian region. For many countries in Asia, the costs of high efficiency, state-of-the-art clean coal technologies were prohibitive. As a result, less costly systems would need to be employed. In order to make reasoned choices regarding appropriate clean coal technologies, planners and power plant engineers needed to have up-to-date information and adequate analytical tools to assist them with their decisions. Those decisions needed to balance the conflicting demands of

economic growth and increased demand for power with increasing environmental impacts which could negatively affect sustainable development.

31. The basis for discussion of further cooperation in the promotion of clean coal technologies considered six common areas for future regional cooperation: (a) regional and national capacity- and institution-building; (b) demonstration and implementation of clean coal technologies; (c) improvements in O&M capability and practices at power plants; (d) enhancement of regional capabilities to conduct financial and economic analysis of air pollution abatement options; (e) enhancement of regional capabilities for ambient monitoring and emission estimation; and (f) enhancement of regional, national and local air quality management.

32. The exchange of experiences among power plant experts and environmental specialists throughout North-East Asia conducted through the technical assistance was an example of successful technical subregional cooperation. Continuation and extension of that type of cooperation was strongly recommended as a means of building national and regional capacity in the subregion to realize the objectives of the programme for environmental cooperation in North-East Asia.

33. Institution-building was a key component for the long-term environmental health and success of subregional programmes for environmental cooperation in North-East Asia. Future cooperation should address the strong need to develop national and regional institutions in the subregion through specialized training. Further, the promotion of regional institutions would lead to great benefits for each country and for the region in terms of capacity development and information-gathering for establishing a mechanism for the regular exchange of information and experiences between national centres and with other experts in the region.

34. There was a need to enhance the decision-making capacity of power plant managers and operators in the subregion with respect to proposed improvements to increase plant efficiency and implementation of environmental protection measures. Technical assistance was needed to train those individuals to identify and evaluate measures for plant upgrades.

35. Further, a concerted effort should be made to raise the awareness of power plant managers on such issues as abatement system availability, system redundancies, regulatory compliance, and so on, so that environmental protection matters would receive priority attention from those at the highest management levels in the organization (i.e., the decision makers).

36. A considerable amount of momentum for addressing air pollution from existing coal-fired power plants in North-East Asia had come about as a result of the project. To capitalize on the “can do” spirit and the friendships and professional associations that had come about from the six technology demonstration workshops and the two expert group meetings, a coordinated set of future activities was proposed to continue the important work that had begun so well.

37. The delegation from the Republic of Korea presented a paper on the evaluation of the technical assistance and the impacts of the technical assistance in the Republic of Korea. The paper noted that the Republic of Korea had participated in all of the project meetings. The paper summarized the conclusions and recommendations and outcomes of each of the meetings of the project and emphasized the outcomes of the technology demonstration on clean coal technology and the expert meeting on environmental data collection, comparability and analysis which were hosted in the Republic of Korea.

38. The representatives of the Republic of Korea summarized the current status of coal-fired power plants in their country. Since the 1970s, power generation in the Republic of Korea had been shifting from oil-fired power generation towards coal and nuclear sources. In 1996, 63.6 per cent of the total electricity generation was from coal and nuclear power sources.

39. The long-term development plan for KEPCO indicated that the share of major energy sources in 2010 would be nuclear (33.1), coal (27.3), liquefied natural gas (27.3). In the recent past, there had been very active efforts to improve the reliability and performance of the electricity generation and improvement in the efficiency of the transmission and distribution system.

40. Efforts in the Republic of Korea to reduce the levels of environmental pollution were described. Recent efforts had included: (a) introducing a telemetering system for environmental surveillance of the performance of pollution removal systems; (b) increasing the use of natural gas and low-sulphur oil; (c) conducting environmental impact assessments to identify potential impacts and preventative measures; (d) developing a long-range project at KEPCO (1,500 billion won) to reduce SO<sub>x</sub> emissions by 65 per cent, NO<sub>x</sub> emissions by 15 per cent, and particulate emissions by 85 per cent from present levels. About 30 per cent of collected fly ash was reused and that percentage was expected to rise to 50 per cent by 2002.

41. Those efforts in the Republic of Korea included notable efforts by KEPCO to establish an environmental management system for the efficient, systematic and complete management of environmental protection. The delegates presented the current emission standards and the short-range goals and action plans related to SO<sub>2</sub> emissions from thermal power plants. While most power plants were currently barely

able to meet current standards, those standards would be made more stringent and flue gas desulphurization systems at many power plants would need to be improved.

42. The delegation from the Republic of Korea deemed that the series of workshops and expert meetings conducted as part of the technical assistance were satisfactory and that there was no limit to the benefits received. The meetings provided the networks with mutual understanding and technical exchange which were essential for increased environmental cooperation in the region. The information and experience exchange among countries was important to discover ways to apply appropriate clean coal technologies to each participating country. It recommended that future clean coal technology projects should be linked with efforts to find less costly alternative means and to locate quickly appropriate funds for the retrofit and upgrade of existing systems.

43. The Republic of Korea noted that investment cost was an important concern for the utilization of clean coal and abatement technologies. It was essential to find a secure funding source for investment from related agencies for those projects. It was recommended that each country express its readiness to participate in further cooperation for regional environmental protection.

44. The representatives of Mongolia presented a paper evaluating the technical assistance and the impacts of the technical assistance on Mongolia. The paper noted Mongolia's strong commitment to regional cooperation as evidenced by the participation of Mongolian delegates at all the project meetings and workshops. The discussions and outcomes of the expert meeting and technology demonstration workshop held at Ulaanbaatar were highlighted.

45. Further evidence of Mongolia's increased commitment to environmental protection as fostered by the project was evidenced by new regulations in support of

the Mongolian Law on Air, which involved regulations for air quality services, procedures for issuing air quality information, regulations for greenhouse gas inventories and air pollutants. Full implementation of the programme would result in a reduction of air pollution in Ulaanbaatar by two thirds. Mongolia had expressed the hope that, under the third subproject, a workplan might be developed to further close the gaps which existed in the measurement and collection of air pollution data in the region.

46. Mongolia expressed its opinion that the present phase of the project had been successful in identifying significant problems common to all countries of the region. Subsequent efforts should concentrate on implementation of projects to address those problems and suggested that one project that might be considered was a project to develop an effective air quality management system for the city of Ulaanbaatar to serve as an example for similar projects in cities of other countries of the region.

47. The representative of the Russian Federation described the participation of his country in the technical assistance project and highlighted the demonstration and on-site workshop that had been hosted in Moscow on the subject of coal fired power plant technologies and environmental protection in the Russian Federation. Clean coal technologies would play a very important role in the future of North-East Asia and Russian technology could be of great benefit to the countries of the subregion. In the near term, the Russian Federation would burn the coal that was readily available and strive to clean exhaust gases; however, in the future, other options would be employed and determined by their economics. Coal-washing would become increasingly important in the future in the Russian Federation.

48. The Russian Federation could offer participant countries cooperation in the fields of fly ash utilization, research and development into clean coal technologies,

and full utilization of the energy and chemical potential of coal resources. There was already an expressed interest on the part of China to develop cooperation with the Russian Federation in the area of fly ash utilization. Further, the Russian Federation restated its offer to involve power station No. 2 at Vladivostok in future technology demonstration workshops, as was mentioned at the Senior Officials meeting in January 1998. That plant would be an excellent site for demonstrations on the topics of electrostatic precipitators, low NO<sub>x</sub> burner technology, and automatic emissions controls, and the city of Vladivostok would benefit greatly from cooperation in the development of air quality management capabilities.

49. Japan indicated that it found the technical assistance project satisfactory and presented its outcomes and concepts for future cooperation in the subregion. The paper noted that Japan had hosted the sixth demonstration and on-site workshop in Yokohama, Japan, in March 1998. The discussion topics, workshop outcomes and recommendations were reviewed.

50. The paper outlined recent efforts in Japan to promote clean coal technology. Such efforts had included legislation, regulatory rules and procedures, experiences with clean coal technologies, monitoring of emissions and ambient concentrations of key pollutants, and studies on practical applications of clean coal technologies. The Basic Law for the Environment of 1967 (updated in 1993) was described and its impact on air pollution reductions assessed. The Air Pollution Control Law, 1968 (APCL) and its associated amendments and regulations had been very effective, especially against SO<sub>x</sub>, dust and NO<sub>x</sub> discharged from stationary sources, including coal-fired power plants. APCL specified three types of facilities to be controlled: “soot-and smoke-emitting facility”, “general dust-discharging facility” and “specific

dust-discharging facilities”. APCL empowered prefectural governors to conduct inspections of operating facilities for the implementation of the emission standards.

51. The paper also reviewed the state of air quality in fiscal year 1996 for Japan. Data for NO<sub>2</sub>, SO<sub>2</sub>, SPM, CO and photochemical oxidants were presented. Additionally, recent studies on the practical application of clean coal technologies were described. The Environment Agency of Japan had also compiled an inventory of air pollution control countermeasures on major stationary sources applicable to developing countries and planned to distribute and disseminate that information by means of technical manuals. A manual on air pollution control measure technology in thermal power plants was published in March 1997 and was directed at providing information for administrative staff and technical engineers engaged in environmental protection in developing countries. The manual would be made available for use in a training course on environmentally sound power generation to be conducted at KEPRI.

52. Japan stressed that the activities of future projects needed to maintain close contact with other relevant and related activities. Japan recommended that high priority be placed on efforts to develop projects to build the capacity for emissions monitoring and estimation in the region. In that regard, the Environment Agency of Japan, in a spirit of regional cooperation, had offered to host an expert meeting on emissions monitoring and estimation under the activities of project No. 2 which had been endorsed at the Senior Officials at Moscow. The Meeting would be attended by experts from North-East Asia, South-East Asia, Europe and North America. That meeting was proposed for Niigata City, Japan, in early February 1999, with the following tentative agenda:

1. Emissions monitoring sessions

2. Emission estimation sessions
3. Study tour
4. Overall discussion and recommendation

53. The Democratic People's Republic of Korea delegation stated that air pollution was not a serious problem in their country. It was noted that coal and hydro were the dominant energy sources in the Democratic People's Republic of Korea. There was a strong commitment to the use of clean coal technologies and to complete a campaign to build mini hydro plants in villages throughout the country. Protection of the environment was an important consideration in the Democratic People's Republic of Korea for the benefit of present and future generations and the priority of environmental programmes was elevated to the ministerial level. The Democratic People's Republic of Korea acknowledged that they had missed several of the important meetings of the project and, as such, had missed out on the opportunities to participate in much of the cooperative effort. However, the representatives of the democratic People's Republic of Korea shared the common interests and desires of the participating countries to conduct the project of regional cooperation. They noted that, while there were difficulties in promoting those projects, those difficulties could be overcome with persistent efforts on the part of the participating countries.

54. The delegation of Japan expressed satisfaction with the development of the technical assistance project and the design of the follow-up projects, particularly projects 1 and 2. The delegation of Japan expressed the hope that ADB would seriously consider funding those follow-up projects in support of regional cooperation.

55. The representative of China provided their comments and observations on the completed technical assistance project and expressed their desire for future regional

cooperation on clean coal and environmental projects. The delegation noted that the regional technical assistance, particularly the technology demonstration workshops, had been helpful in promoting environmental protection and environmentally sound power generation in China. They noted that China had been the host for two technology demonstration and on-site workshops: the first in Tong Liao and the second in Nanjing.

56. Following the workshop in Tong Liao in 1997, the central Chinese government had issued regulations requiring all thermal power plants to meet TSP emission standards. Many older plants had older venturi scrubbers with low particulate removal efficiencies which were not capable of cleaning exhaust gases sufficiently to meet the particulate standards. As a result, many of those systems were in the process of being upgraded, refurbished or replaced by electrostatic precipitators.

57. The technology demonstration in Nanjing had focused on flue gas desulphurization systems for coal-fired power plants and was useful for the elaboration of SO<sub>2</sub> regulations in China. Following the workshop in January 1998, the central government had issued regulations for acid rain controlling zones and SO<sub>2</sub> controlling zones covering about 11.4 per cent of the land area of China. Within those zones, all thermal power plants must meet emission standards, new construction of coal-fired power plants was prohibited in city and suburban areas, new power plants using coal with > 1 per cent sulphur must install desulphurization systems, all older coal-fired plants in those zones must take measures to reduce SO<sub>2</sub> emission before 2005 and install flue gas desulphurization before 2010, and all thermal power plants were assessed a fee of 0.20 yuan renminbi per kg SO<sub>2</sub> total emission.

58. In terms of follow-up to the existing project, the Chinese delegation agreed with the focus and scope of proposed project 1 (see agenda item 6) and hoped that the project would be implemented. Further, it was noted that, in terms of priority areas for cooperation, China would be most supportive of activities in the areas of demonstration and implementation of clean coal technologies and the enhancement of capabilities to analyze air pollution abatement options, as outlined in the concept paper. A desire to support projects in those areas was strongly expressed.

#### **IV. FOLLOW-UP PROJECTS: REGIONAL TECHNICAL ASSISTANCE PROJECTS AND INVESTMENT PROJECTS**

(Item 6 of the agenda)

59. The Meeting reviewed the four project profiles in document ENR/FMR.6 and made comments and suggestions. The four project profiles had been endorsed by the Senior Officials meeting.

60. The Meeting discussed each of the four project proposals in detail. The Meeting stressed the need to take into account the parallel need to incorporate local government decision makers into the training programmes of projects 1 and 2, in addition to technicians, scientists and power plant operators. Additionally, it was recommended that attention should be paid and linkages be developed to local programme activities to enhance the efforts of the national and regional efforts. It was also pointed out that there were many ongoing international projects in the area of atmospheric modelling and environmental monitoring and the design of project 2 should recognize those efforts and strive to cooperate with those other activities without duplication of effort.

61. China noted that it already had four projects under way in the area of flue gas desulphurization demonstration. All four projects were largely financed by foreign

governments and private companies promoting the demonstrated technology. China expressed concern regarding the proposal for project 4 in that the dry sodium duct injection technology to be demonstrated was not at the commercial scale of development and that the source of investment funds to conduct the demonstration was uncertain. In response to those concerns, it was pointed out that dry sodium duct injection was in fact in commercial operation at two coal-fired power plants in the United States, but was not widely used in that country because the lower removal efficiencies were insufficient to meet existing standards in that country. However, under different circumstances, in countries of North-East Asia such as China, regarding requirements for sulphur removal, economics might make that technology very attractive, hence the point of the demonstration.

62. The representative of ADB enlightened the meeting on the modalities for approval and funding of regional environment technical assistance and investment projects in the ADB system. The funding cycle for regional environment technical assistance was most promising for proposals introduced at the beginning of the year. The Meeting reviewed the four projects following the guidance provided by the Senior Officials meeting and agreed that the projects should be submitted to ADB for consideration and approval. The Meeting suggested some modifications in the project documents; the revised documents would be circulated to member countries by the secretariat and submitted to donors.

## **V. OTHER MATTERS**

(Item 7 of the agenda)

63. The Meeting expressed deep appreciation to ADB for the funding that it had provided towards the implementation of the technical assistance project, which had

contributed to the successful initiation of regional cooperation on environmental issues and the promotion of clean coal technologies in the North-East Asian subregion. The Meeting hoped that ADB would seriously consider providing financial support for the four project proposals for follow-on activities which had been endorsed by the Senior Officials and recommended by the participants of the present meeting.

64. The delegation of Japan reminded all participating countries of North-East Asia about the Fifth Senior Official Meeting at Kobe, scheduled from 24 to 26 February 1999.

## **VI. ADOPTION OF THE REPORT**

(Item 8 of the agenda)

65. The Meeting adopted the report on 22 May 1998.