

Terminal Evaluation

Asia

1. Outline of the Project

Country:

China

Project title:

Technology for the Control of Waste Gases in the Petrochemical Industry

Issue/Sector:

Environment

Cooperation scheme:

Project-type Technical Cooperation

Division in charge:

Second Technical Cooperation Division, Mining and Industrial Development Cooperation Department

Total cost:

841 Million Yen

Period of Cooperation 1 November 1995 - 31 October 2001

Partner Country's Implementing Organization:

China Petroleum & Chemical Cooperation (SINOPEC)
Fushun Research Institute of Petroleum and Petrochemicals (FRIPP)

Supporting Organization in Japan:

Ministry of Economy, Trade and Industry
Industrial Science and Technology Policy and Environment Bureau,
Environmental Policy Division, Japan Environmental Management
Association for Industry

Related Cooperation:**1-1 Background of the Project**

Air pollution in the People's Republic of China is becoming obvious as an attendant of the economical growth since the 1970's. The Chinese Government predicted that the amount of energy consumed would be twice as much as that of the 1990s in the year 2002. This problem will become more serious with increased energy consumption.

In terms of countermeasures against pollutants such as SOx and NOx, mid-term and long-term projects are soon to be launched with the cooperation of the Government of Japan, but measures against typical petrochemical waste gas remained an issue. As a result, people living in the large compounds are directly exposed to the dangers of breathing polluted air. Although the issue should have been addressed immediately, conditions remained unchanged.

Under these circumstances, the Chinese Government requested that Japan provide Project-type Technical Cooperation to SINOPEC, one of the three major oil companies.

1-2 Project Overview

Training in the appropriate waste gas control techniques of the petrochemical industry was carried out affiliate companies of SINOPEC. The techniques of gas analysis, catalytic combustion, harmful mists and offensive-odor gas absorbents were transferred to the technicians of FRIPP under SINOPEC.

(1) Overall Goal

The condition of equipment and establishment of waste gas control in the affiliated enterprises of SINOPEC are improved.

(2) Project Purpose

To give FRIPP the ability to provide training on appropriate waste gas treatment techniques (gas analysis, catalytic combustion, harmful mists and offensive-odor gas absorbents) to the affiliated enterprises of SINOPEC.

(3) Outputs

- 1) Counterparts for the waste gas treatment techniques were trained.
- 2) Research methods of waste gas treatment techniques were improved.
- 3) Recommendations could be made for waste gas treatment processing at the implementing factories.
- 4) Enlightenment and dissemination activities relating to waste gas treatment techniques became possible.

(4) Inputs

Japanese side:

Long-term Experts	10	Equipment	270 Million Yen
Short-term Experts	33		
Trainees received	20		

Chinese Side:

Counterparts	36		
Local Cost	38.65 Million Yuen (400 Million Yen including personnel costs)		

2. Evaluation Team

Members of Evaluation Team Team Leader/General: Koujiro MATSUMOTO, Deputy Director of Second Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA
Technical Cooperation Planning: Teruo TAMAKI, Ministry of Economy, Trade and Industry
Waste Gas Treatment Techniques: Satoshi HIOKI, Japanese National Commission
Technical Transfer: Kotaro ENDO, Japan Environment Management Association for Industry
Evaluation Management: Makoto IWASE, Staff, Second Technical Cooperation Division, Mining and Industrial Development Cooperation Department, JICA
Interpreter: Yasuko MATSUDA, International Development Center
Project Evaluation: Ryo TABATA, Material Programming Co., Ltd.

Period of Evaluation 27 March 2001 - 12 June 2001
Type of Evaluation: Terminal Evaluation

3. Results of Evaluation

3-1 Summary of Evaluation Results

(1) Relevance

The Overall Goal of the Project has a high relevance since it sufficiently considers the needs of the affiliated companies of SINOPEC and solutions to the problems of waste-gas pollution. The Project was conducted under the condition air, water and noise pollution were becoming serious problems caused by the increased resources and energy consumption accompanying rapid economical growth in China.

(2) Effectiveness

The transfer of technology was carried out at five factories in three of four areas (waste gas analysis (excluded), catalytic combustion, harmful mists and offensive-odor gas absorbents). Technology transfer was also carried out in the two remaining factories (one transfer was carried out in two locations) before the Project was terminated or almost completed. The achievement of the technical transfer of counterparts has reached the desired level in all transfer areas. In the area of offensive-odor gases, the transfer was not finished due to a delay. Although FRIPP lacks experience, there is no technical problem to prevent attaining the desired level of effectiveness. Therefore, the Project purpose "to enable FRIPP provide training in appropriate waste gas techniques (gas analysis, catalytic combustion, harmful mists and offensive-odor gas absorbents) to the affiliated companies of SINOPEC" was achieved.

(3) Efficiency

The scope of cooperation, timing and system of management were appropriately planned. Inputs were transformed into positive results, especially in terms of the expanding operations of FRIPP and the degree to which the long-term experts demonstrated flexible response to maintained close communications with the Chinese side. These contributed greatly to the improvement of the quality of the cooperation.

The equipment supplied by the Japanese side is being used well. The arrival of some of the equipment was delayed due to an accident during delivery, but because both sides of the Project responded flexibly, no serious problems occurred. The fact that the Chinese side, though understaffed responded to many requests relating to the measures of waste gas control techniques was highly appreciated.

(4) Impact

At Guangzhou Petroleum & Chemical Cooperation, one of the target factories, the process of making practical use of the waste gas control techniques, has started. The movement, installation of factory equipment, is a typical activity of an industrialization experiment. Practical application at a factory of the SINOPEC Yizheng Chemical Fiber Co., Ltd. is also expected. SINOPEC is an advanced company undergoing the process of internationalization, and the strengthening of environmental measures is a fundamental condition for the company's internationalized status. It is the management concept of SINOPEC to balance profit making and environment-friendly activities. The corporation also distributes funds to its affiliates to implement environment measures. As a whole, it is highly expected that the Overall Goal of the Project "to enable FRIPP to provide training in appropriate waste gas techniques (gas analysis, catalytic combustion, harmful mists and offensive-odor gas absorbents) to the affiliated companies of SINOPEC" will be achieved.

- 1) FRIPP waste gas control techniques were widely known to the affiliated enterprises of SINOPEC through its activities that introduced the waste gas techniques transferred during the Project.
- 2) SINOPEC is carrying out a series of environmental activities with two other major oil companies. SINOPEC has the potential to disseminate FRIPP techniques not only to the affiliated enterprises but also among the other oil companies.
- 3) It was observed that the attitude of the working staff of the target factories had changed and that their interests in their working environment had increased.

(5) Sustainability

An organizational change was carried out in February 2000, and SINOPEC established Chinese Petrochemical Co., Ltd. The organization was divided into two entities, and there was a major impact on stock prices. However, there are no institutions or organizations similar to FRIPP, which gives FRIPP a sufficient base to continue to develop research activities. The Chinese side has already made a sustainability development plan and announced a framework for independent operation after the end of the Project.

In terms of budget, the capital needed for independent development of the waste gas control techniques of FRIPP can be secured since FRIPP has wide-ranging support from SINOPEC in terms of research and revenues, and the provision of the techniques to other factories is also expected. In association with the technology, FRIPP is actively carrying out research activities into new areas and will develop further through continued research.

Thus, it is considered that the base for carrying out research and development on waste gas control techniques and its capacity has been established through the inputs of the Project and the efforts of FRIPP.

3-2 Factors that promoted realization of effects

(1) Factors concerning Planning

The Project was carried out in the appropriate time frame and was consistent with the needs of the Chinese side, since the needs of the affiliated enterprises of SINOPEC relevant to waste gas treatment and the basic philosophy of SINOPEC were understood through the preliminary survey. The Project was planned after a sufficient amount of research on the conditions of and around the Project site during the preliminary survey. These external conditions were not particularly changed but maintained.

(2) Factors concerning the Implementation Process

- 1) The Project was carried out during a period when environmental policy was changing, and both nationalism and the economy were growing in China. It was also a time when the need for environmental measures was rapidly becoming pronounced.
- 2) FRIPP is one of the major central research institutes of China in the field of the environment. Dissemination of the techniques progressed owing to the efficient supervision of the affiliated enterprises of FRIPP.

3) The capacity of the Recipient Organization (such as personnel, technology, and finance) was high, as was the ability to master the advanced techniques.

3-3 Factors that impeded realization of effects

(1) Factors concerning Planning

N/A

(2) Factors concerning the Implementation Process

1) Delivery of the equipment was delayed, which slowed down the progress of the Project.

2) The timing of settling matters concerning the local costs of the Scientific Technology Development Project of SINOPEC was not always carried out as planned, which interfered with the implementation of the Project.

3-4 Conclusion

The Project progressed smoothly in general, having attained the desired effect of the Project Purpose on schedule, and the possibility of achieving the Overall Goal is high.

3-5 Recommendations

The Chinese Government commented that a problem of intellectual property right may arise when making practical use and dissemination of the Project results. If such problems occur, adjustments should be made by the related departments and agencies in Japan and China.

3-6 Lessons Learned

In terms of the technical transfer, misunderstandings were reported in the definitions of technical terms between the Japanese and Chinese sides. The definition of terms and contents of the technical transfer should be verified during the planning phase of the Project in order to carry out technical transfer smoothly and effectively.

3-7 Follow-up Situation

N/A