

# Chapter 1

## Introduction

**Study on the Strategic Usage of Coal in the EAS Region Working Group**

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# **CHAPTER 1**

## **Introduction**

### **1. Background and Objectives of the Project**

Accompanying economic development, electricity demand in the EAS region is rapidly increasing, and in order to satisfy this demand, it is thought that thermal power generation will continue to play a central role through a combination of coal and gas. As coal is cost competitive in terms of calorific value compared with gas, and large quantities of coal are produced in the EAS region, it is anticipated that as the main source of power, coal-fired power generation will increase on a broad scale. In the EAS region, Australia, Indonesia, China, India and Viet Nam produce large quantities of coal, and compared with other energy sources such as gas which in part depends on imports from outside of the EAS region, the magnification of the usage of coal in the EAS region has the merit of enhancing energy security.

However, with the increase in coal demands, notably with those of China and India, the supply demand relationship of coal has become tight in recent years. For the sustainable usage of coal, the dissemination of Clean Coal Technology (CCT) for clean and efficient usage of coal in the EAS region is of pressing importance. In addition, in order to facilitate the economic development within the region, a cost effective and sustainable electricity supply system, with CCT at its heart, should be promoted. While the necessity for the dissemination of CCT has been recognized, inefficient technology has still been widely used. It is therefore a concern that should this situation continues, valuable coal resources will be wasted by inefficient technology, environmental impact will not be sufficiently reduced and

sustainability will be harmed.

A technical potential map based on the above-mentioned concerns is of vital importance in order to efficiently disseminate CCT. Namely, it is necessary to suggest a feasible efficiency level, environmental performance and maintenance criterion of each technology so that a country in the region is able to select and introduce the best technologies based on its own situation. At the same time, it is also important to propose appropriate measures so that these can be realized. Upon the completion of this proposed research, “practical” technological potential map including the above mentioned items will be developed in order that policy makers from each country are able to introduce them swiftly.

## **2. Methodologies of the Project**

Various study items were investigated in the project. The research methodology for each item was as follows.

(1) The importance of coal in the EAS region

A) The trends of energy demands and the political positioning of coal in the EAS region

Based on the analysis of IEA data, the trends of energy demands in the EAS region was quantitatively illustrated. Additionally, through the WG meeting held in Jakarta, participating countries’ opinions in regard to the direction of this study, the policies and the situation of coal in each country were summarized.

B) Features of coal resources and their importance

- Comparison of coal and natural gas self-sufficiency rates in the EAS region

- The potential for supply increase through widening of the quality range of coal to be procured
- Comparison of coal and natural gas prices

The features of coal as an energy source was quantitatively assessed through the analysis of self-sufficiency rates in the EAS region and the advantages of coal in terms of cost. The amount of coal supply which can be increased by expanding the qualities of coal procured to included lower rank coals was assessed also. In addition, impact of shale gas was considered in comparison with coal price.

C) The importance of coal and CCT dissemination with a view to improving energy security in the EAS region

Based on the results of the analysis above, the contribution of the enhanced use of coal toward the improvement of energy security in the EAS region, and the importance of the dissemination of CCT for the continuous utilization of coal was outlined.

(2) Economic benefits of the introduction of CCT in the EAS region

A) Anticipated benefit of the introduction of CCT in the EAS region

As anticipated benefits of the introduction of CCT, “minimization of capital outflow from the EAS region”, “environmental impact reduction benefits of CCT”, “development and investment benefits of CCT”, and “job creation benefits of CCT” were studied with the following methodology. Firstly, with regards to the “minimization of capital outflow from the EAS region”, the levels of capital outflow from natural gas imports was estimated via IEA trade statistics. In addition, an understanding of the potential for curbing capital outflow via the dissemination of

CCT in the EAS region was reached. For the “environmental impact reduction benefits of CCT”, a baseline case and CCT implementation case was assumed. The effects of the reduction of CO<sub>2</sub> via the implementation of CCT will be analyzed. “Development and investment benefits of CCT”, and “job creation benefits of CCT”, were studied through individual analysis of input-output tables etc.

#### B) Summary of economic benefits of the introduction of CCT in the EAS region

The items considered in A) was compiled, and the resultant economic ripple effect in the EAS region of the introduction of CCT was outlined.

#### (3) The development of technological potential map for CCT dissemination in the EAS region

Technical potential map for the introduction of CCT was developed. At this time, the following items was addressed.

- Necessary features of generation efficiency and CO<sub>2</sub> emissions intensity
- Necessary technical standards on considering life cycle cost

At the WG meeting in Jakarta, the present conditions and policies regarding the promotion of CCT were heard, and the nature of the technological potential map was considered.