Chapter 1

Introduction

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1.1. Background and Objectives

Alongside economic development, electricity demand in the East Asia Summit (EAS) region is rapidly increasing. It is thought that thermal power generation, through a combination of coal and gas, will continue to play a central role to satisfy such demand,. 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 coal-fired power generation as the main source of power will increase on a broad scale. In the region, Australia, Indonesia, China, India, and Viet Nam produce large quantities of coal; other energy sources such as gas are partially imported from outside the 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 demand, notably that of China and India, the supply and 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 region is thus 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 CCT has been recognised, the use of inefficient technology is still widespread. If this situation continues, valuable coal resources will be wasted, environmental impact will not be sufficiently reduced, and sustainability will be harmed.

The first-year project of this study has been completed and has focused on the economic return from the investments in different types of coal technologies. Its major findings were that investments in CCTs with high efficiency will bring high returns, including savings on coal utilisation. However, the upfront cost investment on CCTs remains barriers for developing countries to afford these technologies.

The second-year project will focus on updating the information from the first-year study and on laying out a technological potential map as part of the process to facilitate the

deployment and dissemination of CCT. This study will essentially suggest a feasible efficiency level, an environmental performance, and a maintenance criterion for each technology so that countries in the region will be able to select and introduce the best technologies based on their individual situation. At the same time, this study will propose appropriate measures so that these technologies can be realised. Upon the completion of this proposed research, a practical technological potential map including the above-mentioned items will be developed so that policymakers from each country are able to introduce the technologies swiftly.

1.2. Methodologies of the Project

This research is a continuation of the first-year study. During the second-year study, the road map for the strategic usage of coal in the EAS region will be updated and five guidelines on the technological potential map will be formulated.

(1) Reconfirmation of the importance of coal in the EAS region

Based on the results of the analysis on the trend of energy demand, the political positioning of coal in the EAS region, and features of coal resources and their importance, the contribution of the enhanced use of coal towards improving energy security in the EAS region, and the importance of disseminating CCT for the continuous utilisation of coal were outlined in a previous study. In this current study, these analyses will be reconsidered by updating numbers and data based on latest trends. In addition, the impact of shale gas development, which has had a decreasing effect on natural gas prices, will be considered in comparison with coal prices.

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

Four anticipated benefits of the introduction of CCT—the minimisation 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 taken up in the previous study. Cost analysis and cost–benefit analysis for CCT introduction will be studied this year. Sensitivity analysis for ultra-super critical (USC), super critical (SC), and subcritical coal-fired power plants will be conducted by assuming capital cost and coal price.

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

The outline and concept of a technical potential map for the introduction of CCT were discussed in the previous study. This year, the necessary guidelines included in the technological potential map will be studied and formulated.

At the Working Group 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.