

## 1A1. Coal Reserve Exploration Technology

### Technology Overview

#### 1. Background

Coal is an important energy resource, responsible for producing 20% of the primary energy supply in Japan. However, 99% of the coal utilized is imported. To promote the sustainable development of coal resources in coal-producing countries and regions with a high potential for coal production, geological surveys, information analysis and evaluations from a variety of perspectives are important to ensure a stable energy supply. Coal reserve exploration technologies have become more precise and the imaging has been improved to provide higher resolution. For example, coal seams that occur under a high-density stratum can now be detected with higher resolution imaging. Also, a technology that allows direct estimation of ash and sulfur content in coal during geophysical logging has been studied. It is therefore important to establish a coal reserve assessment system, based on drilling or other exploration technologies, that will directly contribute to coal resource development and production plans, with a view to lessening the burden on both the local and global environment.

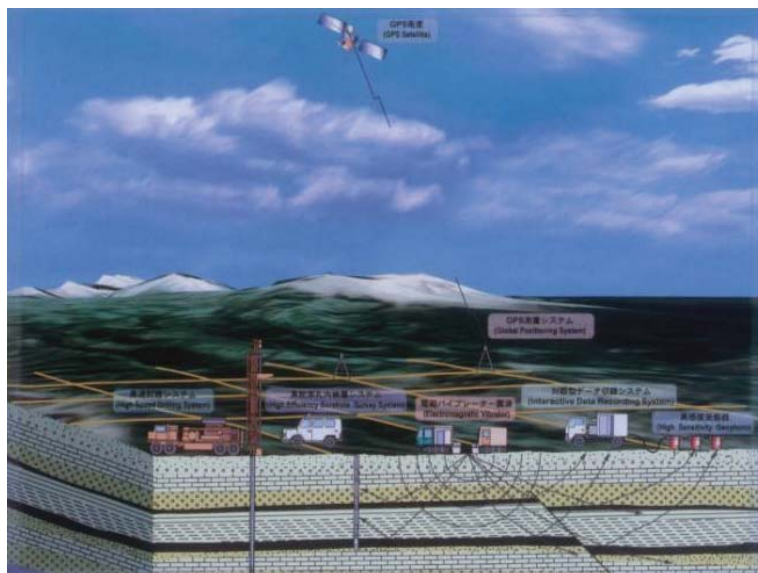


Image of high-resolution, high-efficiency survey system

#### 2. Technology overview

Coal reserve assessment technologies being adopted for overseas coal-producing countries, (e.g. a joint coal resource evaluation survey in Indonesia and joint coal exploration in Vietnam) are to be improved, in addition to the promotion of environmental technologies for global warming prevention, including methane gas recovery in coal mines, carbon dioxide sequestration in coal seams and mine reclamations.

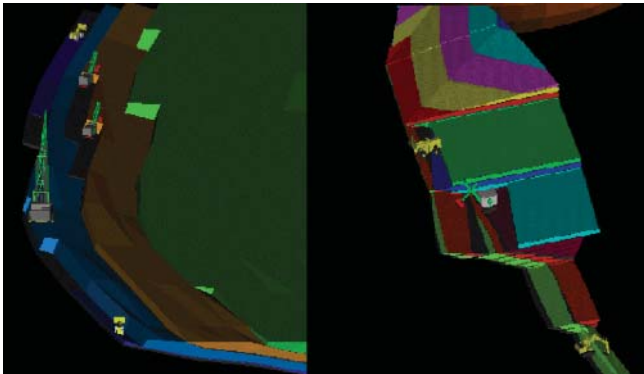
##### Resource exploration

[1] Through a joint study with the Ministry of Energy and Mineral Resources in Indonesia, GIS (Geographic Information Systems)-related technologies have been introduced to south Sumatra to digitize coal resource data, and to build a resource information database to allow general coal resource assessments as well as the development of an integrated software program.

[2] As part of a joint study with the Vietnam National Coal and Minerals Group (VINACOMIN), deep sounding is being carried out on the Quang Ninh coal basin in northern Vietnam for underground mining and coal development.

[3] Through a joint project with Mongolia's Ministry of Industry and Trade, coal resource exploration is currently being conducted in the Eastern Gobi, where the existence of a potential coal supply is anticipated.

Coal resource evaluation system

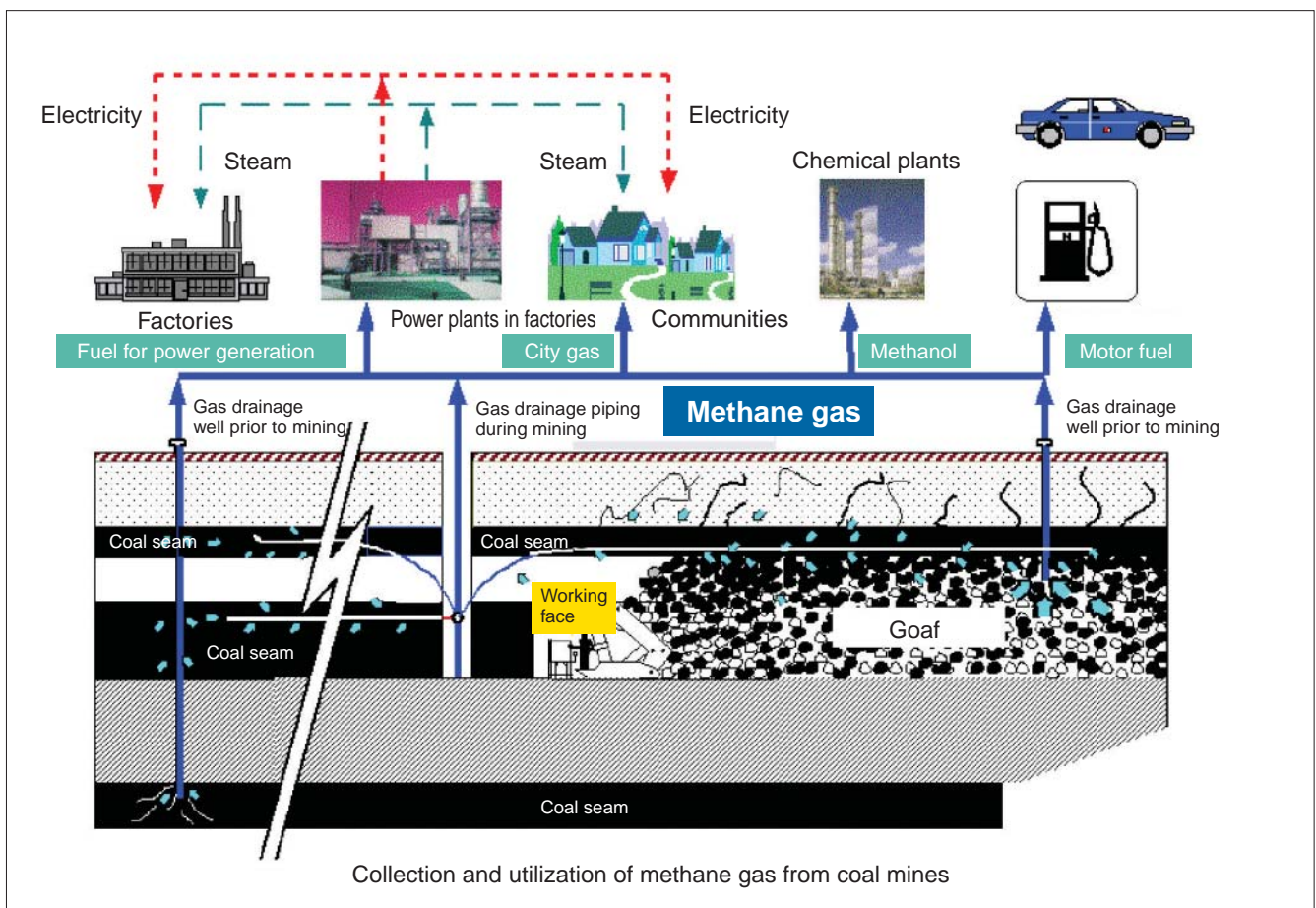


Decision support system for coal development

Geological survey



Drilling survey in Indonesia



Collection and utilization of methane gas from coal mines