

The future of thermal power plants under the expansion of renewable energy in Japan.

Kojiro Hemmi
Research Associate, Research Department,
Japan Electric Power Information Center
Tokyo, Japan

Keywords: *thermal power plant, capacity market,*

Abstract

In recent years the role of thermal power plants has changed with the expansion of renewable energy.

Currently in Japan, about 80% of electricity supply is occupied by generation from thermal power plants. Traditionally, inexpensive coal-fired power plants performed as base load, and gas-fired power has adjusted the supply and demand. However, due to the expansion of variable types of renewable energy such as solar and wind power, even coal fired power plants are changed baseload to balancing power supply. In addition, thermal power plants, which had sufficiently secured the capacity factor in the past, have reduced the capacity factor due to the introduction of renewable energy. Therefore profitability and return on investment from thermal power plants are expected to decrease. On the other hand, since thermal power plants are necessary as balancing power suppliers for renewable energy which fluctuates its output depending on weather conditions.

The government of Japan is planning to introduce capacity market and supply-demand adjustment market. These markets improve profitability and investment predictability of thermal power plants while securing balancing power supply. This report will introduce on this current situation.

In addition, following the Paris Agreement, GHG reduction is a necessity, This report will introduce on measures to reduce CO₂ emission factor such as improving efficiency of thermal power plant through introduction of advanced equipments and technologies.