

How CCS works at future power market in Japan and its impact on the demand of coal

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Overview

There are about 80Mt coal consumed in the power market in Japan. While increasing concern about its carbon intensity, after Fukushima nuclear accident, coal consumption has gradually increased because of stable price and supply sources.

80Mt import of thermal coal to Japan counts about 6% of total coal trading volume in the global market. The main driver of coal consumption increase in Japan is relatively cheaper price among fossil fuel and cost competitiveness in the power market. Coal firing power generation is still one of the cheapest options of electricity just after nuclear.

In order to reduce CO₂ emission of coal power plant, there are two options. One is to improve efficiency of power generation, the other is to attach CCS.

In order to maintain stable supply of power to reduce the cost of CCS is an important factor to consider.

Based on several research and development projects we estimate the way to reduce the cost of CCS.

We need to set target of cost reduction for further introduction and commercialization of CCS in Japan (in progress).

Methods

I conduct interviews with executives of utility companies, trading houses, government officials to create potential scenarios. With literature reviews and empirical analysis of activities.

I also form a study team with experts from companies, research institute to make relevant cost surveys.

Results

Cost of CCS based on conducting projects is around 6-8 yen/kWh.

If we can reduce the cost 20% more, it will be below 5 yen/kWh by 2030. (under review).

It is good enough to compete with the other power sources.

Conclusions

Based on latest improvement of cost reduction for CCS, there are positive prospects to introduce in the power market in Japan.

But it requires more cost reduction.

References

Financing trends and challenges for coal-fired power plants, Paul Baruya, October 2016
On the climate change mitigation potential of CO₂ conversion to fuels, J. Carlos Abanades, Edward S. Rubin, Marco Mazzotti and Howard J. Herzog, Energy Environ. Sci., 2017, 10,