Revisiting the role of coal fired power generation: Beyond the pro- or anti- coal dichotomy

Yoko Ito
The Institute of Energy Economics, Japan
+81-3-5547-0214
yoko.ito@tky.ieej.or.jp

Overview

Fuelled by Paris Agreement, some of the major countries have expressed its intention to phase-out coal fired power generation and also to refrain from financing thermal coal related projects/companies worldwide. At the same time, the role of coal fired power generation is expected to remain considerable for coming decades. For instance, the World Energy Outlook by International Energy Agency (IEA) indicates the share of coal in global power generation would account for 26% in 2040 (New Policy Scenario). In the growing sentiment against coal on one hand, and their needs to secure economical source of electricity on a massive scale on the other, emerging economies are facing greater uncertainty with the prospect of investment in coal fired power generation.

This paper argues that coal related policy debates should not be stagnated with the pro- or anti- coal dichotomy, but that constructive engagement is needed to make sure new or replacement coal fired power plants would be equipped with high-efficiency, low-emission (HELE) technologies, so far as coal is needed as a realistic source of electricity.

To start with, this paper presents an overview of the role and notable features of coal fired power generation in various countries. The relative importance of coal, or the readiness to let go of coal fired power generation, would differ in each country depending on energy and other socio-economic situations, including the availability of other energy sources as well as financial and technological features of existing fleets. Having this in mind, the following points will be summarized about major countries: 1) current share of coal fired power generation, 2) other dominant source of energy available or politically sought after, and 3) features of existing coal-fired power plants (age, size and technology type).

Through this, it draws attention to the rationale for those countries that are pursuing coal phase-out policies, namely, UK, France, Canada and the US (although Trump administration has been redirecting its policy otherwise). By contrast, it also deals with Japan as one of the biggest coal consumers and also a HELE technology provider, and Australia, a major supplier of high grade thermal coal (with less ash content and higher heat content). With regards to major emerging economies, it briefly considers the current status and future challenges of coal fired power generation, namely on China, India, Indonesia, Malaysia, the Philippines and Vietnam.

Methods

Survey and literature review

Results

Those countries that have launched highly touted coal phase-out policy have the following features in common: 1) Existing coal fired power plants are aged enough to have recouped financially, while lagging behind in generation efficiency, 2) The role of coal fired power generation is negligible (e.g. 2.2% in France) or already diminished, as other energy source is either dominantly available (natural gas in US and hydro in Canada) or politically secured (nuclear in UK and France). In these countries, coal phase-out campaign was mobilised in a timely manner and gave a strategic leverage in their international negotiations for decarbonization.

In contrast, Japan has been plagued with uncertainties about the restart of nuclear power plants since “March 11” on top of other challenges in energy policy, such as securing stable and economic supply of LNG, managing renewable energy power generation costs and grid stability. With regards to coal, by strenuous efforts since the 1970s, Japan has achieved the world’s cleanest coal utilization in terms of generation efficiency and environmental measures. With this technological advancement, combined with its energy constrains, Japanese government has given a greater role to coal fired power generation on a condition that further uplift in overall generation efficiency would be achieved. Likewise, Japan is aspiring also for its role as a HELE provider in international sphere.

Australia has a domestic coal industry, thus socio-economic gravity of global coal phase-out is assumingly far greater than any other country. Based on Paris Agreement, Australia is expected to strengthen its policy engagement towards improving coal fired power generation efficiency domestically. At the same time, being the main producer of high grade coal, anti- coal pressure to Australia could give rise concerns for energy security in Asia and may deter timely introduction of HELE in the region.

Many of the emerging economies have just started counting on coal fired power generation to fullfill fast growing electricity demand. So far, their generation efficency is not as high as the current technology can achieve. The importance of HELE will rise as coal fired power generation is expected to remain as one of the dominant sources of power supply in the region.

Conclusions

Now that climate change policy is gaining momentum, phasing-out of coal may make socio-economic sense in countries where underperformance of coal fired power generation had been kept against the state-of-art technologies. In others, any premature coal phase-out may pose grave concerns for power supply as well as financial losses, with a notable example of Japan. Considering the potential role that HELE coal pwer generation can play in emerging economies, coal policy debate should be redirected from simplistic pro- or anti- coal campaign to reducing dependence on less efficient, environmentally harmful use of coal fired power generation.

References

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