

Session2

Coal Consumption in China and Its Impact on Environment

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Abstract

China became the largest emitter of CO₂, surpassing US in 2006. China's large CO₂ emissions are attributable not only to a sharp increase in energy consumption in recent years but also to a high dependence on coal, whose impact on climate change is biggest among all energy sources. Coal accounted for 68.9% of total primary energy consumption in 2005 (excluding biomass energy). However, it is not practical, in fact, for China to depart from its dependence on coal. One reason is that China has no other energy source of a scale similar to coal to support her rapid economic growth. Coal's share in energy consumption has continued to increase since 2003, although it was decreased from 1997 to 2002. This shows that coal still plays the most important role in satisfying energy demand, especially in periods of rapid demand rapid growth. Other energy forms, such as oil and gas face big challenges in increasing domestic production because of resource shortages and high cost. Moreover, the impact on international oil and gas market could be disastrous if China were to switch its major energy source from coal to oil and gas. Even now, China's oil consumption ranks the second next to US and her ratio of dependence on imported crude oil has reached 45%. It has been forecast that China will be the largest oil importer in the world by 2030, even though coal will still be the dominant energy source at that time.

The key issue, therefore, is how to build a sustainable coal utilization system to lower environmental damages. To reduce CO₂ emission, there are some technological measures, such as energy-efficiency technology and, looking ahead, carbon capture and storage (CCS). However, we recognize that social and economic factor plays key roles in deployment of such technologies.

China's coal utilization system is very different from those of other countries. For example, in Japan almost all coal is used by large-scale power plants and steel makers. In the US, more than 90% of coal is used in the power sector. By contrast, in China the percentage of coal usage by power sector remains around 50% and furthermore, the average scale of a unit of China's coal

fired plants was only 60.9MW in 2006, much smaller than the average Japanese unit of 487.6MW. In addition, around 30% of coal is burnt in industrial or residential boilers, most of which are small, consuming only several thousand tons of coal per year. Those facts show that China's coal utilization system consists of many small users, whose emissions are difficult to monitor, creating difficulties for enforcement of environmental regulations.

In spite of such difficulties, China's government is now promoting strong policy initiatives to achieve an ambitious energy conservation target under the 11th Five-Year Plan (2006-2010). The target is to improve the energy consumption intensity of GDP by 20%, that is, to reduce by 20% the amount of energy needed to a unit of GDP, compared with the level of the year 2005. The most important measurement to achieve this target is to internalize environmental degradation cost into coal price. In a related matter, a new coal pricing reform has been undertaken from January 2007 in Shanxi province, the largest coal production base in China. This reform is intended to raise coal prices by 15-20%, which is expected to result in reduction of coal demand through market mechanisms. The other noteworthy development is the surprisingly rapid deployment of flue gas desulfurizing equipment (FGD) in recent years. In 2000, only 7 million kW power plants were equipped with FGD, but this was increased to 45 million kW by 2006 and is planned to rise further to 178 million kW by 2010. Installation of FGD equipment costs billions of JPY for a single unit, but is promoted by strong policy initiatives under the 11th Five-Year Plan (Another critical factor was 80% cut of installation cost through domestic production). Although rapid deployment of FGD equipment is limited for large power plants, it is expected to reduce SO₂ emissions by around 40%.

These examples of coal pricing reform and deployment of FGD equipment show the determination and increased capacity of the Chinese government to struggle with environmental problems. Of course, there still exist many problems, especially in policy monitoring and implementation. For example, it is reported that some FGD are installed but not operated except in government inspection because of high operation cost. Due to the present coal utilization system, direct regulation doesn't necessarily work well because of limitations in monitoring and enforcement of environmental policy. Consequently, policies to utilize economic incentives, such as environmental taxes, shall be considered to accelerate deployment of energy conservation technologies.

However, the author will conclude that China is now going in the right direction and taking proper measures at large, considering the constraints arising from her coal-based energy system, although it is more difficult and complicate to solve climate change than problems arising from SO₂ emissions.

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