

Energy Transition and Future of Fossil Fuels (1)

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Energy is a good that is indispensable for civic life and economic activities. Providing energy in a stable, economically rational and environment-friendly manner is a very important basic challenge for all societies. Energy sources and energy supply infrastructure differ by country or society depending on the endowment of energy resources, the economics of energy development, transportation and consumption, the social acceptability and adaptability of energy sources, and other matters. Energy options vary depending on local conditions. On a macro global scale, however, fossil fuels such as oil, coal and natural gas clearly account for most energy supply. According to BP statistics, oil accounted for 34% of global primary energy supply in 2018, coal for 27% and natural gas for 24%. The three fossil fuels captured a combined 85% of energy supply. Non-fossil energy sources accounted for a combined share of only 15% -- 7% for hydro, 4% for nuclear and 4% for renewables other than hydro. It is a fact that fossil fuels constitute the center of energy in the world on the strength of their economic rationality and competitiveness.

At present, however, a view is growing that the world is in the midst of a new energy transition. The view means that the world has entered a new energy transition since the beginning of the 21st century following the 20th century called “the century of oil” after coal replaced natural energy like windmill, water wheel, horse power, human power, etc. as a dominant energy source through the industrial revolution. The most attention-attracting driving force for the transition may be innovation brought about by the enhancement of climate change countermeasures. If greenhouse gas emissions are to be held down, human beings have no choice but to increase dependence on non-fossil energy sources emitting no GHG or utilize carbon capture and storage (CCS) or carbon capture, utilization and storage (CCUS) technologies to prevent carbon dioxide emissions into the atmosphere through fossil fuel consumption. Under very ambitious climate change initiatives including a European movement for “net zero” emissions, fossil fuel consumption may be restricted very tightly.

As increasing uncertainties about the future of fossil fuels are recognized in such situation, there is growing concern that fossil fuels as the current dominant energy source would become “stranded assets.” Particularly, there emerges a view that coal that features the highest CO₂ emission intensity among the fossil fuels has become subject to the highest stranded asset risk and to such concern. Mainly in Europe, calls for coal phaseout policies have grown, making the construction or operation of coal-fired power plants difficult. The anti-coal trend is spreading beyond Europe, leading to global calls for coal restriction and phaseout policies. The wind starts to blow not only against coal but also against oil as the most dominant energy source and natural gas as the cleanest fossil fuel. In the most symbolic case, Europe is moving to decarbonize natural gas. Given that even natural gas is nothing more than one of the fossil fuels and contributes to climate change, Europe has launched initiatives to switch from natural gas to biomethane, synthetic methane, hydrogen and other CO₂-free gases. Initiatives have also been launched to diffuse electric and fuel cell vehicles and

reform mobility to hold down oil demand and switch to zero-emission energy sources.

Behind the growing initiatives to try to phaseout fossil fuels are rising recorded temperatures, frequent wildfires, super typhoons and other abnormal weather events that have increased globally. In response to these abnormal weather events, social movements including the “Greta Thunberg phenomenon” for toughening climate change countermeasures have grown, along with political forces seeking to enhance such countermeasures. Among goals for limiting temperature rises, calls are growing for a 1.5°C goal rather than the 2°C goal that is no longer seen as “ambitious enough”. In accordance with the more ambitious goal, initiatives to achieve “net zero” emissions by 2050 have been announced in some countries. Then, uncertainties have grown about the future course of fossil fuels, leading to great challenges for fossil fuel stakeholders.

At the same time, however, major long-term energy outlooks in the world forecast that fossil fuels will remain a main energy source until 2040 or 2050. In the Stated Policy Scenario given in the latest World Energy Outlook by the International Energy Agency, fossil fuels will account for a combined 74% of global energy supply in 2040, including 28% for oil, 25% for natural gas and 21% for coal. Even in the Sustainable Development Scenario where the world would achieve United Nations Sustainable Development Goals including climate change goals, fossil fuels will command a combined share of 58% including 23% for oil, 24% for natural gas and 11% for coal. The IEEEJ Outlook 2020 by the Institute of Energy Economics, Japan, gave the Advanced Technologies Scenario in which maximum technological advancement is expected under a bottom-up approach to structurally change energy supply and demand, indicating that fossil fuels will account for a combined 68% of energy supply in 2050, including 28% for oil, 24% for natural gas and 15% for coal. Both long-term outlooks show that fossil fuels will remain a dominant energy source, though with their shares falling from the current levels.

These outlooks that represent objective analyses based on market realities demonstrate wide gaps with nominal indications that fossil fuels could become stranded assets soon as their consumption is substantially restricted due to the global enhancement of climate change countermeasures. One of such gaps is seen between a force growing mainly in Europe for phasing out fossil fuels and a reality in Asia serving as a driver for global energy demand expansion amid current and future economic growth. In most Asian emerging market and developing economies, stable energy supply at affordable prices is indispensable for future economic growth. They are required to integrally and comprehensibly cope with not only climate change but also air pollution, access to modern energy, clean water supply and other basic needs. As a matter of course, China, India and other Asian countries are urgently required to make coal cleaner and reduce coal consumption to tackle air pollution. In this sense, fossil fuels’ share of energy supply will be reduced gradually, as indicated by the abovementioned energy outlooks. Given Asian realities, however, it may be impossible for Asia to phase out fossil fuels by or even beyond 2050.

Given the realities, it is important to make fossil fuels cleaner while retaining them as a main energy source. Priority should be given to the thorough pursuit of advanced and cleaner coal consumption, the development and diffusion of technologies for capturing and utilizing CO₂ emissions from fossil fuel consumption, their combination to utilize CO₂-free hydrogen and synthetic fuels, and the promotion of natural gas and LNG, the cleanest among fossil fuels. Also important are the thorough improvement of energy efficiency and the expansion of non-fossil energy sources including renewables and nuclear. Indispensable for Asia are pragmatic approaches to balancing economic growth and environmental conservation in line with economic and social realities.

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