

Emerging Challenges for Oil, Gas and Electricity Supply Security under the New Energy Market Situation

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Energy security, defined as securing the necessary and sufficient quantity of energy for civilian life, economic activities and national management at reasonable prices in a stable manner, is a vitally significant challenge for any country or human beings. The history of the international energy market indicates that energy security looms as a particularly important policy challenge when a country becomes a net energy importer, faces rising energy import dependence and sees a sharp energy price hike triggered by some factors. Behind sharp energy price hikes have been various risk factors including contingent risks such as war, revolution and accident, and structural risks such as investment shortages, market dominance and excessive concentration in or dependence on some supply sources, regions or suppliers. In this sense, we can conclude that a risk or problem identified as the most serious or important at any given age or time has become an energy security challenge in the international energy market.

The greatest matter of concern regarding energy security has traditionally been linked to oil supply security. This is because (1) oil accounts for the largest share of primary energy supply, (2) oil is the largest energy good for international trade that exerts great influence on the world economy and international politics through trade and price fluctuations and causes great changes in the balance of power between oil producing and consuming countries, and (3) numerous grave oil supply security incidents have actually shaken up the world, as symbolized by the two oil crises in the 1970s.

Even at present, oil supply security is a new important challenge attracting attention from energy stakeholders. An oil price slump from the second half of 2014 had lasted far longer than expected, leaving the international oil market in oversupply. This year, however, crude oil prices have risen back above \$70 per barrel. As a matter of course, rebalancing has been behind the oil price rebound. In addition, growing geopolitical risks in the Middle East, the center of global oil supply, have contributed much to the price hike. Problems identified as the most important recently are an expected possibility of reduction in Iranian crude oil exports after the United States' offer to withdraw from the Iran nuclear deal and regional turmoil involving Iran that could become a potential risk for oil supply from the Middle East. There has not been any incident in which recent geopolitical risks in the Middle East pose a direct threat to oil supply from the region. As indicated by a report released by the Institute of Energy Economics, Japan in October 2016, however, any large-scale oil supply interruption in the Middle East could exert a great impact on the world. In this sense, oil supply challenges mainly in the Middle East under a new situation remain extremely important even at present.

However, not only oil supply security is attracting global attention. In a symbolic development, the International Energy Agency, which was created in response to the 1973 oil crisis and designed to enhance oil supply security, is about to address gas and electricity supply security in

addition to oil supply security. The IEA is planning to reorganize or rebuild energy security amid changes in the international energy situation.

Interest in gas supply security has grown due to fundamental factors including gas's rising share and significance in primary energy supply and expanded international gas trade through pipelines and liquefied natural gas. Internationally, however, Russia's suspension of pipeline gas supply through Ukraine in 2009 highlighted the significance of gas supply security particularly at the European policy level. In the past few years, however, few people have apparently identified any urgent gas supply security risk in the international gas and LNG market supported by oversupply or abundant supply. Rather, how to secure, decide and implement investment to meet future gas demand expansion is seen as the most important challenge for stabilizing gas supply and demand and sound development of the gas market.

However, the Russian gas problem is still seen as one of major gas supply security challenges mainly in Europe. In this context, the diversification of gas supply sources and methods is a central measure to enhance gas supply security. Discussions on Nord Stream 2 and other projects to diversify international gas pipeline routes in Europe have always been sandwiched between the consciousness of the need for the diversification and the economic efficiency or feasibility of diversification projects. The current gas supply security issue features the utilization of LNG as a more flexible gas supply sources, the improvement of LNG market liquidity and the development and enhancement of LNG market functions that are viewed as important for strengthening gas supply security.

Electricity supply security has become an important energy security challenge for the present and future in a sense. This is because the stable supply of electricity as a final consumption good is growing more important at a time when the electrification of energy demand has made and is expected to make progress in the world. Any disruption to stable electricity supply may inevitably and greatly affect civilian life, economic activities and national management.

Present international discussions on the important electricity supply security indicate some important issues that should attract attention. One issue is potential vulnerability arising from excessive dependence on some electricity sources. In the United States where gas has become the largest electricity source thanks to the shale revolution, for example, extraordinary winter cold waves' impact on gas supply could spill over to electricity supply. Intermittent renewable energy sources' growing share of power generation has also been recognized as an important challenge for stable electricity supply. Countermeasures including those to absorb such intermittency have grown more important.

As electricity market liberalization promoted mainly in developed countries has caused constraints on necessary and sufficient electricity investment, new challenges such as the introduction of a capacity mechanism or capacity market are seen in numerous countries or regions, indicating a new challenge for stable electricity supply. This problem is coupled with the expansion of intermittent renewable energy electricity sources to exert complicated effects. Electricity market stakeholders also pay attention to the possibility that extraordinary weather conditions, large-scale natural disasters, terrorism including cyberattacks and other unique events could become serious risk factors. How to enhance the resilience of electricity supply capacity under the new market situation has become an important challenge. As far as energy security remains critically important, how to ensure supply security in oil, gas and electricity markets under a new situation will continue to be the most important energy policy challenge.