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Analysis of the Impacts of COVID-19 on the Global Demand for Oil, Natural Gas and LNG

Ken Koyama¹ and Shigeru Suehiro²

The Institute of Energy Economics, Japan (IEEJ)

Introduction

The new corona virus (COVID-19) pandemic continues to spread worldwide. According to the World Health Organization, the number of persons infected by the virus had reached 292 thousand on March 22, causing 12,784 deaths, with cases of infection found in more than 170 countries. With the risks of the virus showing no sign of ending, the spreading pandemic poses a grave threat to the world economy and a drop in the world economic growth rate appears unavoidable. As a result, energy demand has begun to shrink worldwide, causing prices in global energy markets to plunge.³ The magnitude and duration of the fall in demand will greatly influence the supply-demand balance in global energy markets and also crude oil and LNG prices, severely affecting global energy industries, the economies of oil/gas-producing countries and the economies of consumer countries.

Considering the gravity of the situation, for this special flash report we developed a demand analysis model and used it to analyze the slowdown of the world economy in 2020 due to COVID-19 and the resulting fall in the demand for oil, natural gas and LNG. Since the situation remains highly uncertain, we prepared for the following two different scenarios, the “early stabilization scenario” and the “protracted pandemic scenario”, in addition to the baseline scenario based on the demand forecasted without taking account of the impacts from COVID-19, and analyzed the fall in demand by region, product and sector of use. The key findings of the analysis are discussed below.

1. Analytical Framework

We had to make important assumptions about the economic growth rates in different regions of the world. For the baseline scenario, namely without COVID-19, we took the economic growth rates from the latest edition (January 2020) of the World Economic Outlook published by the International Monetary Fund (IMF). Then, considering the uncertainty in predicting the worldwide spread of COVID-19, we prepared for the following two scenarios.

Early Stabilization Scenario (ESS):

Infection by COVID-19 has peaked in China, and is assumed to peak also in Japan and South Korea in March or April, and in April or May in Europe, North America and Iran. In the Middle East countries other than Iran, and also in South America, Africa, South/Southeast Asia, Russia, Central Asia and Australia, the infection will not spread to a serious level. The risks caused by infection will mostly end during July and August, after which economic activity will begin to recover to normal levels.

¹ Managing Director and Chief Economist at IEEJ

² Manager of Energy and Economic Analysis Group, Energy Data and Modelling Center, IEEJ

³ On March 18, 2020, the WTI crude oil futures price fell to US\$20.37, barely above the US\$20 threshold. It is nearly one third of the average WTI crude oil price in 2019, which was US\$57.04.

Protracted Pandemic Scenario (PPS):

Infection by COVID-19 has peaked in China, and as under the ESS, is assumed to peak also in Japan and South Korea in March or April. However, in Europe, North America and Iran, infection will continue to spread until peaking in July, August or September. It is also assumed that infection will spread to the Middle East countries outside Iran, and also to South America, Africa, South/Southeast Asia, Russia, Central Asia and Australia. As the world economy slows down, economies in East Asia will continue to be impacted negatively by the impact on tourism and trading even after infection in the region reaches its peak. The fall in prices of crude oil and other energy commodities will continue to impact the economies of Middle East countries, Russia and other producing countries that are heavily dependent on the export of energy commodities. Economies will keep plunging throughout 2020 and be unable to recover to normal levels by the end of the year.

Figure 1 compares forecasts for the world economy under the different scenarios, while Figure 2 shows the predicted falls in quarterly GDP from the baseline scenario (“without COVID-19”).

Figure 1: World economic growth rate forecasts under different scenarios

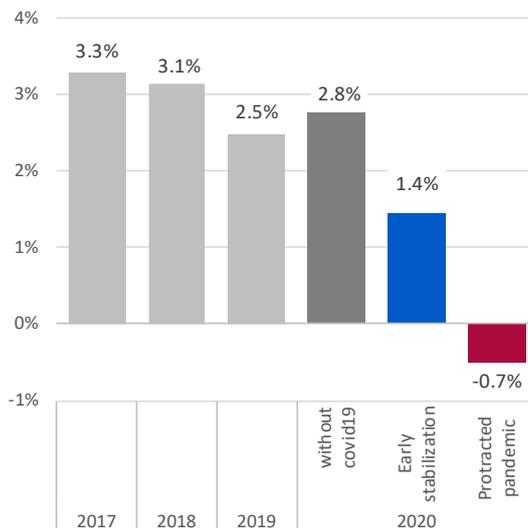
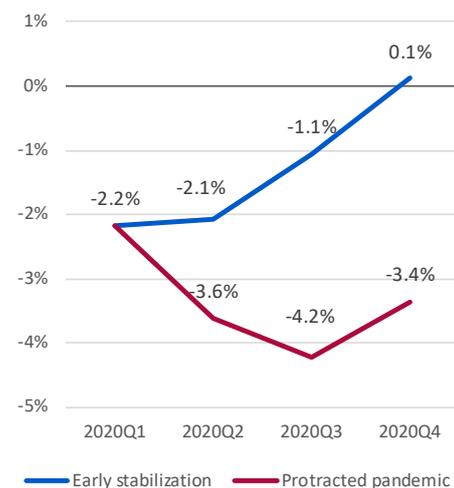


Figure 2: Forecasted falls in quarterly GDP from the baseline scenario



Source: Forecasts produced by IEEJ

It is still difficult to predict when the risks of infection by COVID-19 will stabilize. We prepared for the above two scenarios for this analysis based only on what we can assume at present. We will continue to monitor the related developments and may review the assumptions as necessary.

We performed the analysis using quarterly economic growth data by region, for which we divided the world into four OECD regions (North America, Europe, Japan + South Korea and Oceania) and eight non-OECD regions/country (China, India, ASEAN, Middle East, former Soviet countries, and three other regions).

We analyzed the oil demand in these 12 regions, dividing oil products into the following categories for product-by-product analysis: LPG, naphtha, gasoline, jet fuel, kerosene, diesel oil, heavy fuel oil, and others. We also analyzed the natural gas demand for the 12 regions, distinguishing the demand

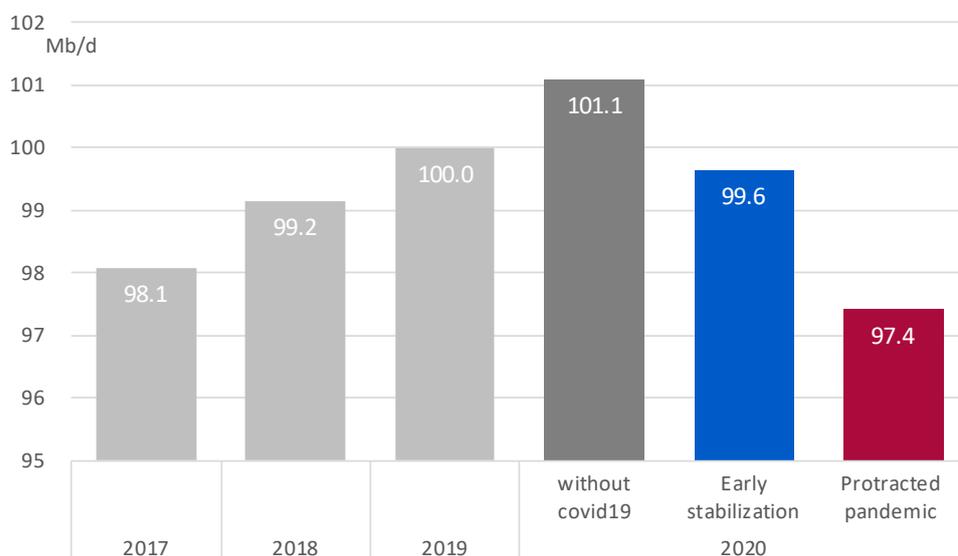
for power generation from that for other purposes, determining the natural gas global trade volume from the total demand, and using it to forecast LNG demand.⁴

For the 2019 actual figures (including estimated actual figures) used as the starting point for forecasting, data from the International Energy Agency (IEA) were used for oil demand. Concerning natural gas demand, IEA data were used for OECD countries while various statistics were used for non-OECD countries. For LNG, data from Cedigaz were used.

2. Outlook for Oil Demand

Figure 3 shows the outlook for global oil demand during 2020 under the different scenarios indicated by our analysis. In the baseline scenario (without COVID-19), global oil demand in 2020 is expected to reach 101.1 MBD (million barrels per day), which is 1.1 MBD (1.1%) above the 2019 level of 100.0 MBD. Much of the demand is expected to come from Asian nations including China, India and ASEAN countries.

Figure 3: Outlook for global oil demand during 2020 under different scenarios

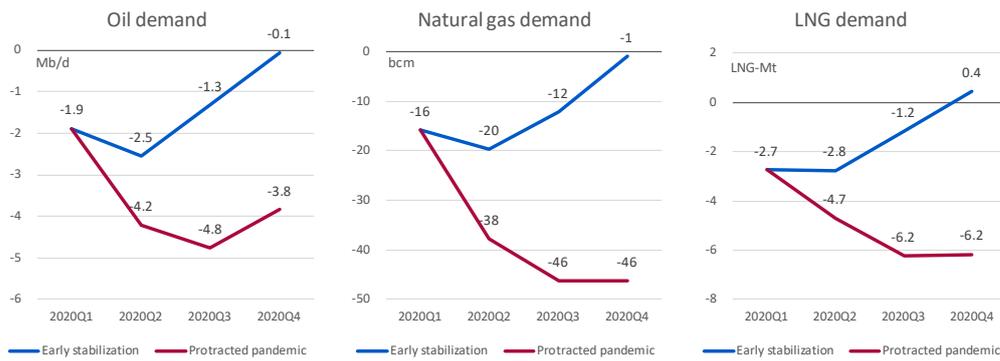


Sources: Data from IEA “Oil Market Report.” Forecasts produced by IEEJ.

When impacts from COVID-19 are taken into account, global oil demand is expected to fall significantly. Even under the early stabilization scenario (ESS), global oil demand in 2020 is expected to fall to 99.6 MBD, which is 0.4 MBD less than the 2019 level, and a major fall of 1.5 MBD less than the baseline scenario. Under the protracted pandemic scenario (PPS), global oil demand in 2020 is expected to fall further, to 97.4 MBD, a severe fall of 3.7 MBD (3.7%) less than the baseline scenario. This would be the lowest level of demand experienced in the last four years, even lower than that recorded in 2017.

⁴ When forecasting demand by product and by sector, we referred to various statistics, forecasts, etc., and also employed our own “expert judgment”.

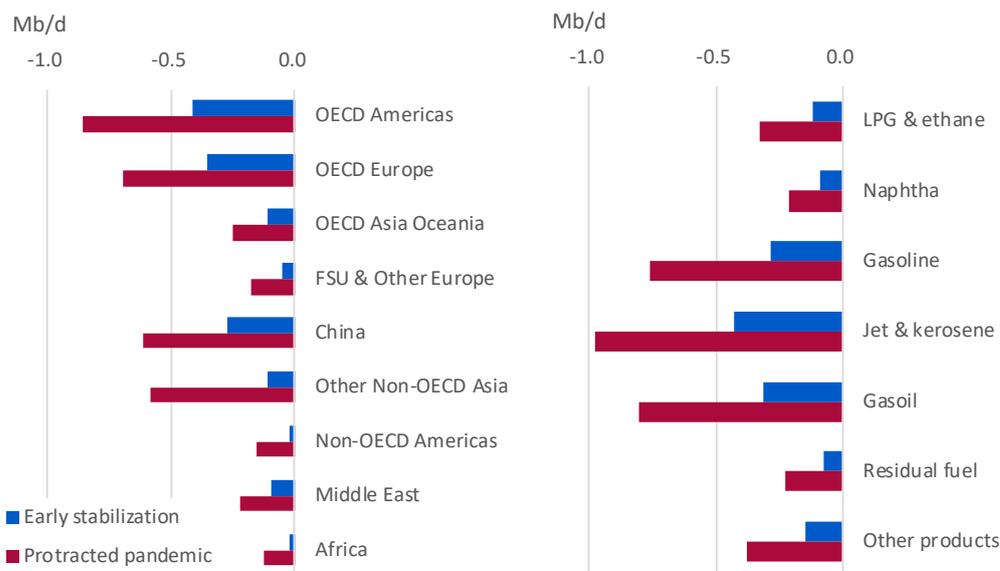
Figure 4: Divergencies in the forecasted quarterly global demand for oil, natural gas and LNG from the baseline scenario



Source: Forecasts produced by IEEJ

Figure 4 shows divergencies in the forecasted quarterly global demand during 2020 for oil (and also for natural gas and LNG) from the baseline scenario. Under the ESS, the fall in oil demand from the baseline scenario hits the bottom in the second quarter, and recovers to that comparable with the baseline scenario in the fourth quarter. Under the PPS, demand falls dramatically, reaching a fall of 4.8 MBD from the baseline level in the third quarter, and continuing to be significantly lower in the fourth quarter. Due to the diminished demand from the second quarter, the market will be under great pressure to rebalance supply and demand. While COVID-19 spreads, price competition accelerates as the “OPEC Plus” gave up to continue coordinated action to reduce oil production. In this situation, it has already been predicted by many that the supply surplus will become as large as 3 to 4 MBD plus during the first half of 2020. If the fall in demand occurs as predicted by our analysis under the ESS or PPS, the degree of oversupply will worsen. This may accelerate the destabilization of the oil market and requires monitoring the situation.

Figure 5: Fall in demand from the baseline scenario (by region, by product)



Source: Forecasts produced by IEEJ

Figure 5 shows, by region and by product, the forecasted divergence of demand from the baseline

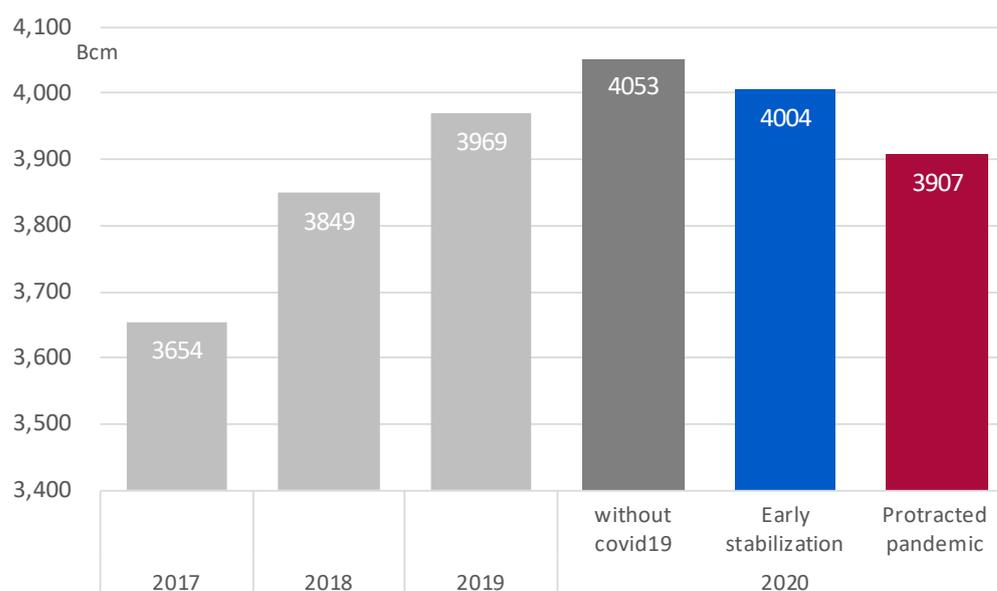
scenario for oil products during 2020 under the two scenarios (ESS and PPS). By region, the fall in demand is expected to be significant not only in China and emerging countries in Asia, which have so far driven the increase in global demand, but also in Europe and North America where infection by COVID-19 is widespread. By product, demand for fuels used mostly in the transportation sector, namely jet fuel, diesel fuel and gasoline, will plunge. As many countries impose lockdowns or request voluntary self-isolation, the longer the infection continues to spread, the longer the impact will last. The reduction in economic activity will also reduce the demand for gasoline and diesel oil.

3. Outlook for Natural Gas and LNG Demand

First, we examine the impacts on the natural gas demand. Under the baseline scenario without COVID-19, global natural gas demand in 2020 was projected to expand to 4,053 BCM (billion cubic meters), achieving the growth of 84 BCM (2.1%) from the previous year. As natural gas is considered a relatively clean energy option, demand for natural gas has increased steadily throughout the world in recent years, and the baseline scenario anticipated that this trend would continue. Under the ESS, demand in 2020 is projected to be greater than in the previous year, but by only 35 BCM, which is less than half of the increase forecasted under the baseline scenario. Under the PPS, the demand in 2020 is projected to be 60 BCM less than the previous year (Figure 6). If global natural gas demand decreases from the previous year, it would be the first time in 11 years since 2009 when demand was hit by the Lehman shock.

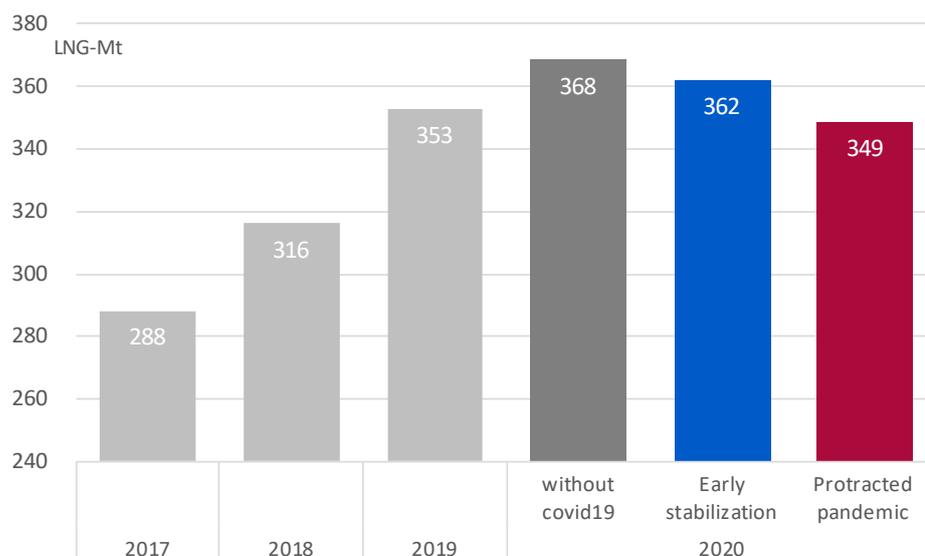
By sector, the fall in demand for natural gas for power generation is projected to be significant: 10 BCM (0.8%) down under the ESS and 54 BCM (3.9%) down under the PPS. This would occur not only because power demand would decrease due to the reduction of economic activity, but also because some developing countries would choose more affordable energy options as their economies slow down, causing a relative decrease in the demand for natural gas.

Figure 6: Outlook for global natural gas demand during 2020 under different scenarios



Sources: Data from BP Statistical Review of World Energy 2019. Forecasts produced by IEEJ.

Figure 7: Outlook for global LNG demand during 2020 under different scenarios

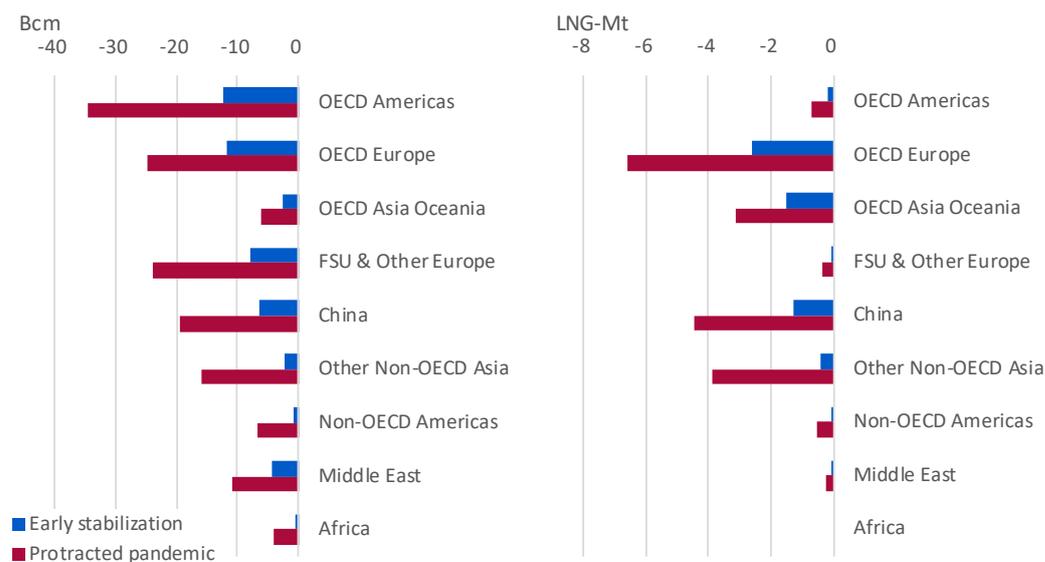


Sources: Data from statistics produced by Cedigaz. Forecasts produced by IEEJ.

Figure 7 compares the outlook for global LNG demand during 2020 under the different scenarios. Although the forecasted trend for LNG is similar to that for natural gas, the fall in demand could be more striking for LNG for certain reasons. The global LNG demand (import volume) has increased far more strongly than natural gas demand in recent years, with a year-on-year growth rate of 9.6% in 2018 and 11.6% in 2019, for example. The major factors were expanding LNG demand in China and other emerging countries in Asia and strong LNG demand in Europe. Under the baseline scenario, growth of demand in 2020 was projected to be at 4.4 %, milder than during the last two years, but still, the annual demand was forecasted to be as large as 368 MT (million tons). However, under the ESS, demand is projected to grow more slowly to 362 MT, while under the PPS, demand in 2020 is expected to be 349 MT, which is 5 MT down from the previous year. That is, global LNG demand, which has grown by around 10% in recent years, may plunge due to the impacts from COVID-19. This may happen as LNG demand decreases significantly as the worldwide natural gas trade volume diminishes due to the stagnating demand for natural gas. Demand for natural gas will also fall due to competition with other energy options (like coal) as well as for LNG due to competition with not only other energy options but also with pipeline gas. Note that if LNG prices fall significantly (in comparison with other energy options including pipeline gas), the situation may be affected in various ways.

Figure 4 shows divergencies in the forecasted quarterly global demand during 2020 for natural gas and LNG from the baseline scenario. Under the ESS, both the natural gas demand and the LNG demand will fall the greatest from the baseline scenario in the second quarter, and will both recover nearly to the baseline scenario in the fourth quarter. Under the PPS, however, both demands are projected to remain very weak throughout 2020, with low demand persisting through the third and fourth quarters.

Figure 8: Fall in demand from the baseline scenario (for natural gas on the left, for LNG on the right)



Source: Forecasts produced by IEEJ

Figure 8 shows, by region, the fall in forecasted demand during 2020 from the baseline scenario for natural gas and LNG. As to natural gas, although the fall in demand is expected to be significant also in emerging and developing countries in Asia and elsewhere, the projected fall in demand in major natural gas consuming regions of the world, namely, in Europe, North America, former Soviet countries, and so on, is more significant. A similar trend is expected regarding the fall in LNG demand by region. Since the center of LNG demand in the world is Asia, the fall in LNG demand is projected to be significant particularly in China and other emerging countries of Asia, and also in Asian OECD countries like Japan and Korea due to the economic slowdown and other factors. Under the PPS, LNG demand is projected to fall significantly also in Europe, another center of LNG demand, due to the protracted worsening of the risks of infection by COVID-19.

4. Conclusion

Compared with the forecasts made under the baseline scenario without COVID-19 impact, the forecasts made under the “Early Stabilization Scenario” assuming that the risks of infection stabilize relatively early and the economy returns to normal, and the forecasts made under the “Protracted Pandemic Scenario” assuming that the risks are protracted and spread in certain regions, predict significant falls in the demand for oil, natural gas and LNG depending on the extent of the economic slowdown, etc.

Although the extent by which demand falls will be chiefly determined by the degree of economic slowdown, the demand for oil products will be influenced also by various secondary factors such as the fall in demand for transportation services, the competitive position in relation to other energy options, and whether or not a given region is a major consumer of a given product.

Particularly under the Protracted Pandemic Scenario, the forecasted fall in demand is extremely large for every energy commodity. If the scenario materializes, it will lead to a significant oversupply in global markets, causing the prices of given products to collapse. The falling prices and shrinking

demand will suppress the profits of global energy industries, and severely impact the economies of oil and gas producing countries.

Although the fall in prices of oil and gas commodities is favorable for net-import and consuming countries, it is not entirely good news since the root cause of the fall is a global economic depression. Furthermore, the situation may lead to instability in oil and gas producing countries which are important for the global energy supply security/stability, and such instability and uncertainty over the future could later cause insufficient investment in global energy resources supply chain which is essential for energy security.

Closing note:

When performing the analysis for this report, we decided to prioritize the timely release of the results, considering the importance of the problem and rapidly changing situation, and therefore relied on information available at present when making assumptions. The COVID-19 crisis may unfold in various ways and must be closely monitored. As to the demand for oil, natural gas, LNG, etc., we must keep watching market trends and changes in demand, with detailed attention to various aspects such as by region, product and sector. Considering such uncertainty and changing situation, we may need to update the analysis if required.

Contact :report@tky.ieej.or.jp