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Demand for Oil, Natural Gas, and LNG Facing the Worst Global Economic Conditions since the Great Depression

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Introduction

As the coronavirus (COVID-19) pandemic rages worldwide, the world economy is sinking to unknown depths. In the latest update of its quarterly World Economic Outlook released on April 14, the International Monetary Fund (IMF) projected a drastic slump in the world economy of minus 3.0% in 2020. This far exceeds the decline in 2009 following the financial crisis (the “Lehman shock”), which was considered at the time to be a once-in-a-century crisis, of minus 0.1% and is believed to be the worst since the Great Depression that began in 1929. The decline is especially severe in the United States and advanced European countries that have been hit particularly hard by COVID-19.

This drastic economic slump, combined with restrictions on the movement of people and goods by city lockdowns and the like to prevent further contagion as well as a collapse in the number of international travelers and demand for transportation, is starting to have a massive impact on the global energy demand. This, in turn, is causing an unprecedented glut in international markets and major uncertainty, as represented by the crash in oil prices, for the international energy market, the world economy, and international politics. The extent of the decline in energy demand going forward will determine the path to stability not only for the international energy market but for international affairs as a whole.

Accordingly, this report analyzes the global demand for oil, natural gas, and LNG using two scenarios for the world economy in 2020, which we prepared based on the IMF World Economic Outlook and our previous special report³, to examine the implications of such demand on the international energy market.

1. Analytical framework

For this estimate, we had to make key assumptions about the economic growth rate in 2020. We took the economic growth rates in various regions of the world from the latest World Economic Outlook (released in April 2020) of the IMF, and established the following two scenarios.

The Reference Scenario (RS)

Based on the latest IMF outlook, we assumed that the world economy would record negative growth for the first time since 2009 caused by the financial crisis, declining by 3.0% year-on-year under the RS. We assumed that the pandemic would end in the second half of 2020 and the economy

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³ Koyama and Suehiro, “Analysis of the Impacts of COVID-19 on the Global Demand for Oil, Natural Gas and LNG” (IEEJ, March 23, 2020)

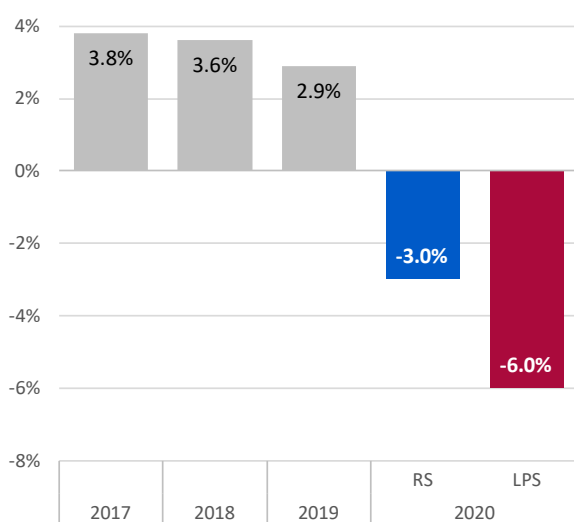
would recover after bottoming out in Q2. The Chinese economy was projected to recover in Q2 after falling significantly in Q1.

The Longer Pandemic Scenario (LPS)

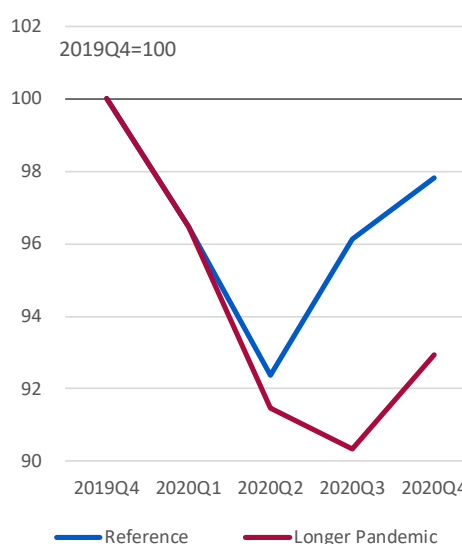
The IMF’s outlook suggests different possibilities for the COVID-19 pandemic aside from the above scenario in which the world economy shrinks by 3%. Based on the IMF’s assumptions for a “longer outbreak in 2020” (the virus will continue to spread for 50% longer than the reference scenario), we prepared the LPS in which the spread of the virus is prolonged and has a more serious impact on economic activity. The LPS assumes that global economic activity will not bottom out until Q3 and the 2020 GDP growth rate will fall 6% year-on-year.

For the analytical framework other than the economic growth rate described above, refer to Koyama and Suehiro (2020)⁴ mentioned earlier.

GDP growth rate



GDP level (quarterly)



2. Outlook for oil demand

Under the RS, oil demand is projected to fall by 9.3 million B/D (9.3 Mb/d, down 9.3% year-on-year) to as low as 90.7 Mb/d in 2020. This is equivalent to the level of demand in around 2012. The global oil demand has decreased in the past, such as the decline in 2009 caused by the financial crisis and those caused by the oil crises in the 1970s, but the estimated decline this time is the largest ever since at least the 1960s.

Demand will fall particularly sharply in Q2 to 83.3 Mb/d (down 16.0% from the same quarter a year earlier). City lockdowns have been in place since March in Europe, the United States, and other countries, covering half of the world population. While declines in macroeconomic activity do cause a decline in oil demand, it is these lockdowns that are believed to exacerbate the decline in terms of volume.⁵ We assumed city lockdowns of a maximum of two months in this estimate, which is why

⁴ Koyama and Suehiro, “Analysis of the Impacts of COVID-19 on the Global Demand for Oil, Natural Gas and LNG,” (the IEEJ, March 23, 2020)

⁵ See Suehiro and Koyama, “An Estimate on the Impact of a “City Lockdown” on the Global Energy Demand” (IEEJ, April 9, 2020).

the decline in demand focuses on Q2⁶.

One notable result of this analysis is the far smaller demand for transportation fuel resulting from restrictions on the movement of people. The fall in demand for gasoline, diesel oil, and jet fuel (plus heating oil) accounts for nearly 80% of the fall in oil demand. The full-year demand for jet fuel (plus heating oil) is projected to fall by 26% year-on-year as the demand for international flights will take time to recover even after the lockdowns are lifted. By region, demand will fall drastically in North America and Europe which are under city lockdowns and have high rates of car ownership. Under this scenario, China, where the pandemic started, will manage to contain the pandemic relatively quickly, enjoy an economic recovery sooner than other regions (1.2% growth in 2020), and suffer a relatively smaller decline in oil demand than Europe and the United States even though the decline will reach nearly 1 Mb/d full-year.

Under the LPS, oil demand is projected to fall by 12.8 Mb/d (12.8%) year-on-year to as low as 87.2 Mb/d. As with the RS, demand will be the lowest in Q2, but the infection will continue to spread for longer and the recovery of demand in the second half of the year will be slower. As the fall in demand for transportation fuel due to restrictions on the movement of people (the city lockdown effect) will be factored in mainly in Q2, and as the fall accounts for a very large proportion of the overall decline, the fall in oil demand will comprise a smaller share of the additional fall in GDP (of another 3%) under the LPS compared to the RS.

These predictions suggest that along with the degree of decline in the macroeconomy, the length of the lockdowns will have a major impact on the pattern of the future decrease in demand for both the LPS and RS. We assumed that lockdowns would continue for 60 days in this estimate, but should they become even longer, oil demand would fall even further under both the RS and LPS.

Even under the RS, the full-year decline in oil demand will reach 9.3 Mb/d year-on-year (down 9.3%), with an enormous fall of 15.9 Mb/d year-on-year (down 16.0%) in Q2. The decline is so great that it is making OPEC Plus's 9.7 Mb/d joint production cut agreed on April 12, one of the biggest in history, looks weak in comparison, putting further downward pressure on oil prices. On April 15, the WTI crude oil futures closed at \$19.87, falling below the \$20 threshold for the first time in 18 years.

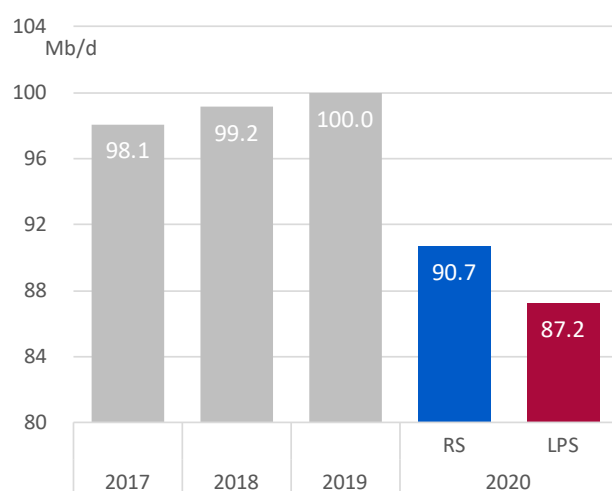
Some expect that the joint production cut will far exceed 10 Mb/d, with a cut of 9.7 Mb/d from OPEC Plus and contributions from other non-OPEC oil producers. Even if this happens, however, an enormous supply glut will be inevitable at least in Q2. The world's stocks of petroleum are stored in land-based stockpiling facilities, tankers, pipelines, and so on. Based on the current supply-demand situation, land-based stockpiling facilities may reach their operating capacity by around May or June, making it necessary to mobilize all other options to absorb the oversupply and prevent oil from flooding the market.

⁶ Considering the large decline in demand caused by city lockdowns, differences in assumptions for the conditions, duration, scope (target country or region), etc. of such lockdowns may produce a considerable difference in the size of the decline. For example, this estimate projects a global oil demand of 83.3 Mb/d for Q2, 2020 while the IEA projects 76.1 Mb/d for the same period. For the IEEJ's assumptions on the conditions, duration, and scope of city lockdowns, see "An Estimate on the Impact of a 'City Lockdown' on the Global Energy Demand" (IEEJ, April 9, 2020).

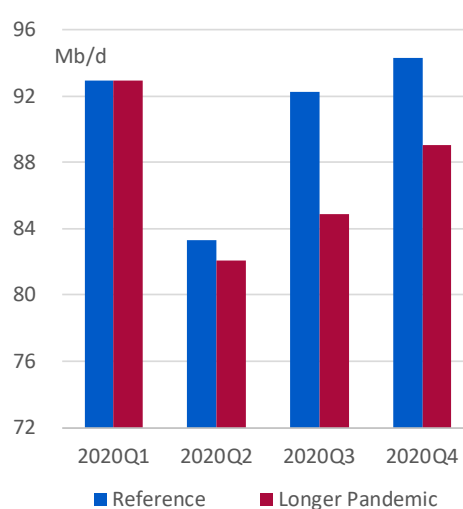
Oil market players are keenly aware of this possibility, which continues to impose downward pressure on oil prices. If oil demand declines in line with the pattern in the LPS and not the RS, there could be a massive crash in oil prices.

A slump in oil prices or excessively low price levels could destabilize international financial markets by straining or destroying the finances of oil producer economies, affecting their stability, hampering essential medium- to long-term investments, and triggering further falls in stock markets, leading to various other critical problems. The G20 is already discussing ways to address this problem through international cooperation. For the stability of both oil producer and consumer countries and of the world, initiatives and international collaboration for stabilizing supply and demand in the international oil market are needed.

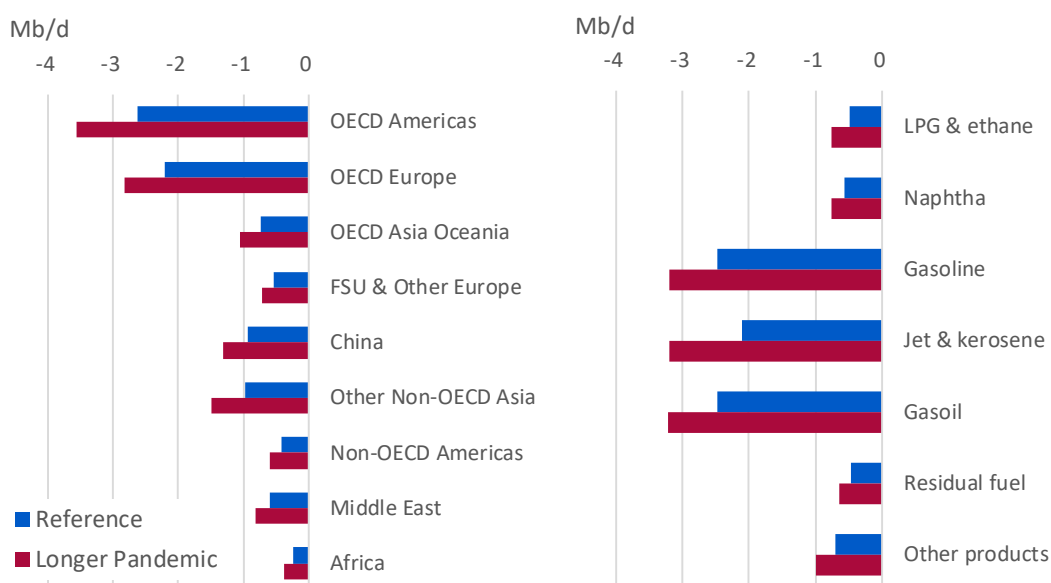
Oil demand (annual)



Oil demand (quarterly)



Year-on-year change in oil demand (2020)



3. Outlook for natural gas and LNG demand

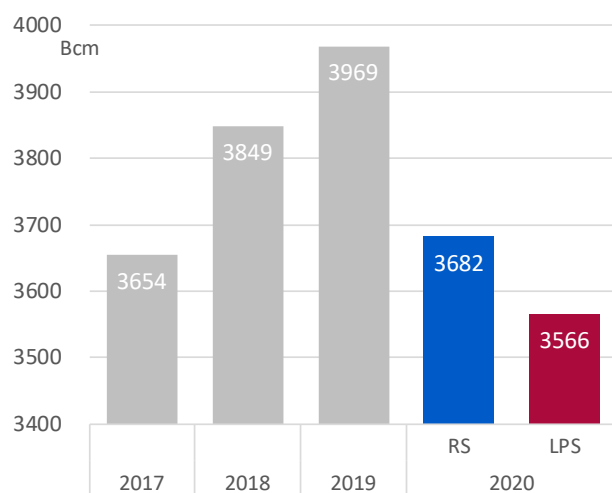
3.1 Natural gas

Under the RS, natural gas demand is projected to fall by 7.2% year-on-year to 3,682 Bcm in 2020, which is close to the level of demand in 2017. The scale of this decline is striking considering that natural gas demand fell only 2.0% in 2009 after the financial crisis. The main cause of a drop in natural gas demand is a fall in electricity demand; the significant fall in demand for power generation accounts for nearly half of the drop in natural gas demand as a whole.

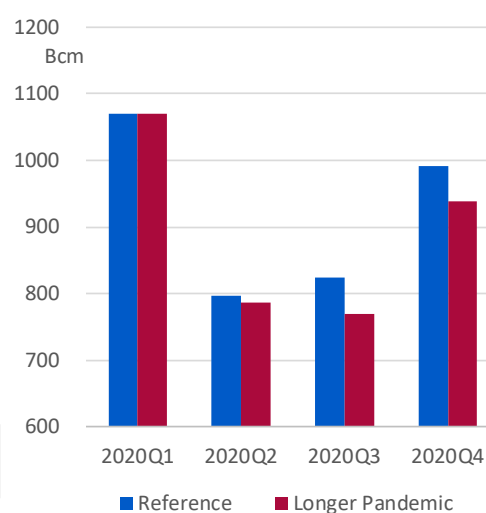
In terms of timing, the decline will be greatest in Q2 when economic activity hits the bottom, shrinking more than 10 percent with minus 13.1% year-on-year. In particular, the decline will be sharp in North America, Europe, and former Soviet regions which are major natural gas consumers and have been hit hard by the pandemic, together accounting for three-fourths of the global decline. These regions together account for nearly 60% of the global demand for natural gas and are also active in gas-fired thermal power generation.

Under the LPS, global natural gas demand is projected to fall by as much as 10.2% year-on-year to 3,566 Bcm. The regional pattern of decline is the same as for the RS, with massive declines in North America, Europe, and former-Soviet regions. By quarter, however, unlike the RS, global natural gas demand will be the lowest in Q3 in line with economic activity. As for oil, the impact of the fall in transportation fuel demand due to city lockdowns is extremely large and thus, the demand becomes the lowest in Q2 when city lockdowns take place. Meanwhile, natural gas demand will bottom in Q3 under the LPS as the impact of lockdowns is smaller than for oil and therefore the macroeconomy play a bigger role.

Natural gas demand (annual)



Natural gas demand (quarterly)



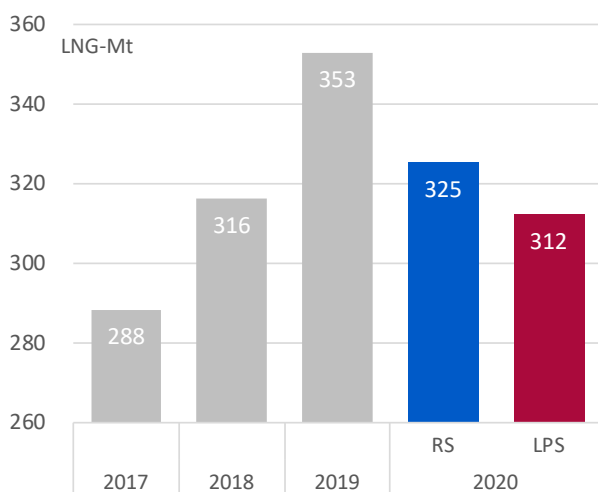
3.2 LNG

Under the RS, LNG demand is projected to fall by 28 million tonnes year-on-year (7.8%) to 325 million tonnes in 2020. Global LNG demand grew steadily by 6.3% even in 2009 after the financial crisis and has seen near-double-digit growth in recent years, but in this estimate, demand will fall sharply by 7.8% as the global economy plummets.

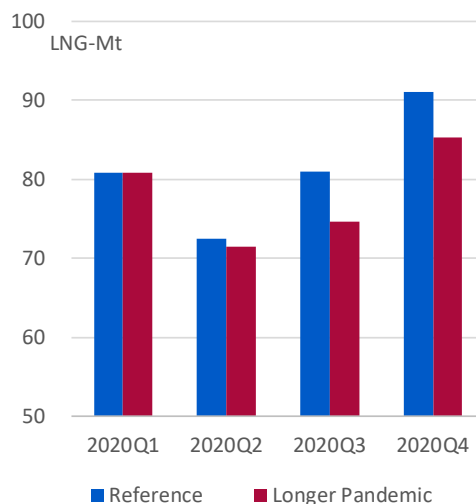
As with natural gas, the largest falls in demand will occur in major LNG consumer regions, namely Asia and Europe. Demand will decrease by 13 million tonnes in OECD Europe, 7 million in OECD Asia, and 4.7 million in non-OECD Asia, amounting to 24.7 million tonnes in total and accounting for 90% of the loss in global LNG demand. In terms of timing, the decline will be greatest in Q2 and then will recover gradually toward the second half of the year. However, the process of recovery in LNG demand will depend on the different timings of economic recovery among countries.

Under the LPS, the global LNG demand is projected to fall by an additional 13 million tonnes from the RS to 312 million tonnes, or by 11.5% year-on-year, falling below 2018 levels. The regional characteristics and the timing of the decline in demand will basically be similar to that for the RS.

LNG demand (annual)

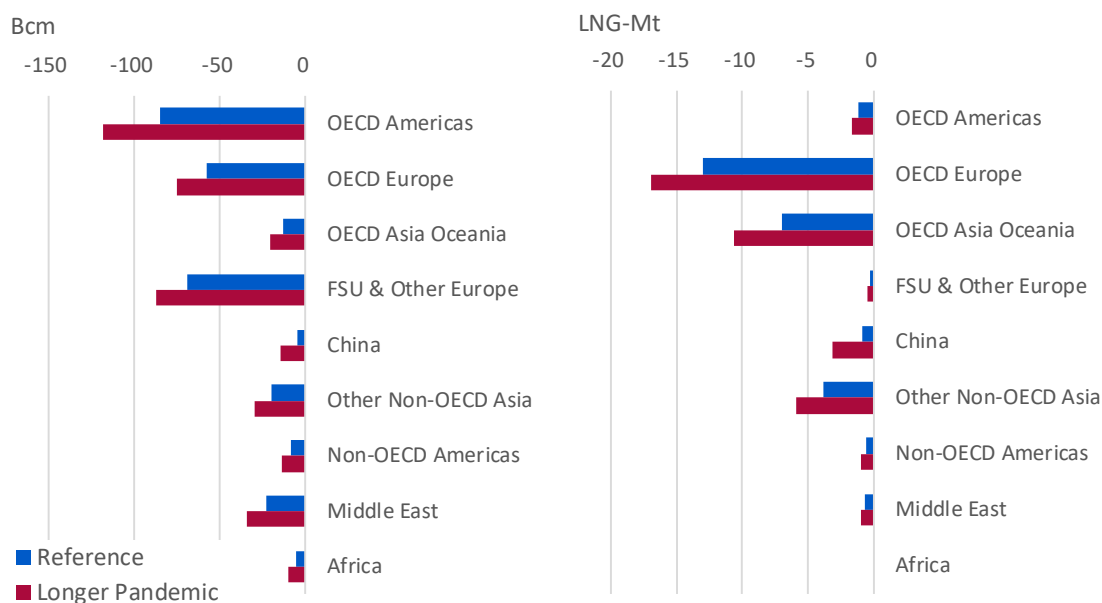


LNG demand (quarterly)



Year-on-year change in natural gas demand (2020) (2020)

Year-on-year change in LNG demand



If a decline like the one in this estimate occurs in the LNG market which has grown rapidly to date, it is likely to cause a large glut. Even without the impact of COVID-19, the LNG market was projected to be oversupplied in 2020. The 2020 outlook of the IEEJ released in December 2019 forecasted an oversupply with an estimated global LNG demand of 369 million tonnes against a supply of 381 million tonnes. If demand falls to 325 million tonnes as projected in this estimate under the RS and to 312 million tonnes under the LPS, the supply-demand gap (oversupply) would reach 56–69 million tonnes based on the supply above. This huge oversupply would impose strong downward pressure on the LNG spot price which is already down to the mid-\$2 range per million BTU.

Further, considering that the prices of long-term LNG contracts, which form the bulk of LNG supply in Asia, are basically linked to crude oil prices, and as oil prices are expected to remain low according to the oil market outlook above or could fall even further, long-term LNG contract prices are most likely to fall drastically in the future, following oil prices with a time lag. Incidentally, the average LNG arrival price in Japan, which buys mainly through long-term contracts, has mostly been in the \$9-10 range per million BTU from April 2019 and is at \$9.3 as of March of this year.

Factors that will further complicate the market situation and make management decisions difficult for those in the LNG business include what will happen to the correlation between long-term LNG contract prices, which will go down with oil prices with a time lag, the LNG spot price, which will face downward pressure as the supply-demand balance eases, and the US LNG price, which is based on domestic natural gas prices plus a “fixed costs”.

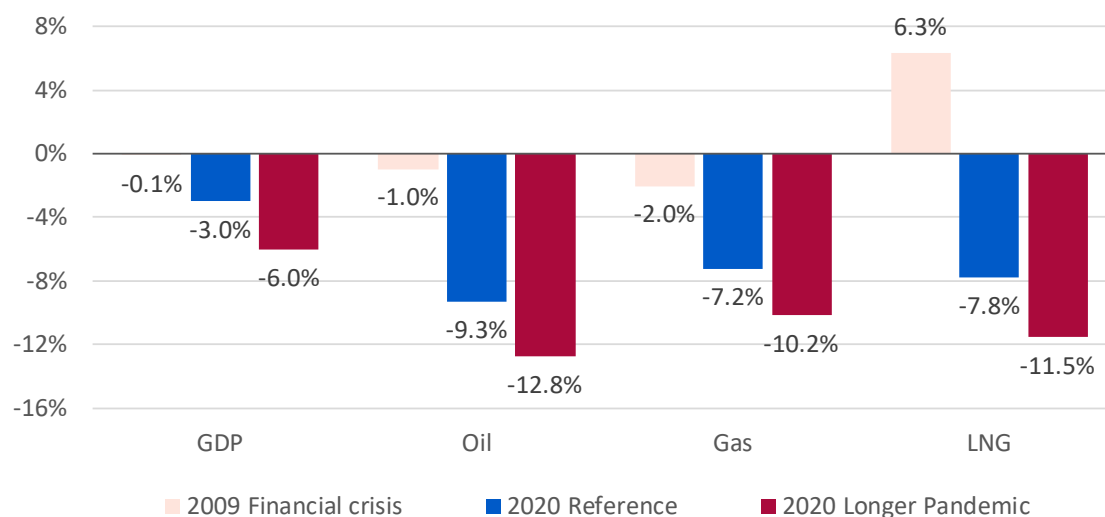
Will a rapid fall in LNG prices stimulate demand? What will happen to forward-looking investments in LNG in a low-demand, low-price environment? The answers are not yet clear.

4. Conclusion

The impact of the COVID-19 pandemic will cause declines in economic activity and energy demand far exceeding those during the 2008–2009 financial crisis (the “Lehman shock”), which was regarded at the time to be a once-in-a-century event. Notably, the decline in oil demand consists mostly of a decrease in demand for transportation fuel due to restrictions on the movement of people and goods, and is thus different in nature from a simple slump in economic activity. Also, LNG demand, which grew steadily even during the previous financial crisis, is expected to fall sharply this time.

This unprecedented decline in demand will result in a sustained, massive supply glut in the international oil, natural gas, and LNG markets at least during 2020, and continue to place downward pressure on the prices of these energy commodities. It is crucial to consider negative factors in the international energy market, global economy, and international politics resulting from the collapse in demand and prices, and to proceed with initiatives to stabilize the markets through international cooperation.

Year-on-year change in GDP and demand for various energy sources



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