



Economic and Sociopolitical Implications of the COVID-19 Pandemic in Global Energy Markets

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Abstract

The article presents the economic and sociopolitical consequences of the pandemic COVID-19 in global energy markets. The relationship between the decline in social, economic activity, and energy consumption is analyzed. Traditional linkages between energy supply and demand have been eroded by the changing economic and social conditions of the world. Forecasts of the decline in global energy investment for 2020 are based on data on the severity and duration of the ongoing health crisis, the economic slowdown, and the large share of uncertainty surrounding these factors. A comprehensive method using entropy indicators is proposed as one of the forecasting tools. The basic forecast of many authoritative international economic organizations for 2020 is a large-scale global recession caused by restrictive measures of socioeconomic activity. With the gradual opening of economies currently in isolation, the recovery is U-shaped and is accompanied by a significant permanent loss of economic activity. The work explores investment and financial trends in all areas of energy supply, efficiency, and research and development (R&D). Current indicators and analytical materials and information on risks in the field of energy security and sustainability were provided. The impact of a large-scale global recession caused by months of restrictions on movement, social, and economic exclusion is quantified.

Keywords

Coronavirus • Crisis • Energy • Energy markets

JEL Classification

E20 • F01 • F42

1 Introduction

The coronavirus pandemic caused an unprecedented macroeconomic shock. The World Health Organization reported 4 million confirmed cases and more than 300,000 deaths. The disease affected almost 200 countries and territories, and so far, only, a few countries have experienced a peak in cases. To slow the spread of the virus, governments around the world have imposed restrictions on most social and economic activities. These include partial or complete isolation, a day curfew, the closure of educational institutions, and non-essential enterprises, as well as prohibitions on public meetings. Some 4.2 billion people, or 54% of the world's population, representing almost 60% of world GDP, have been subjected to total or partial isolation. To date, almost the entire world population has been affected by quarantine measures of varying degrees.

People's Republic of China (hereinafter PRC) is the first country to report a pandemic. It accounted for 16% of global GDP and 24% of energy demand in 2019. At the end of January, the PRC introduced restrictive measures that had severe macroeconomic consequences. Then, isolation measures followed in many European countries. India, representing one third of global energy demand, announced isolation in March. The United States, which represented 53% of world primary energy consumption in 2019, also announced quarantine measures. In early April, China began to lift restrictions and restart factories, but social distancing measures remained in place, preventing the restoration of the

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service sector. In Africa, the total number of reported cases is lower than in the most affected regions of the world, but this is more due to the small number of tests carried out. Fifty African countries have been affected; the number of cases continues to increase, and quarantine measures are increasing. At the same time, already in the period from mid-March to the end of April, the share of world energy consumption in the conditions of removal of complete or partial isolation increased sharply from 5 to 52%. The extent to which energy consumption is changing is shown in Fig. 1.

2 Materials and Methods

The isolation regime has led to a shock in supply and demand. The shock of the proposal arose as a result of deliberate restrictions on economic activity: Useful enterprises, factories are closed to prevent the spread of the virus. The decline is partially offset by the growth of digital business activity, as well as some other sectors of the economy, primarily by an increase in sales of medical equipment. However, in general, restrictions significantly reduce the overall level of supply.

Demand shocks are resulted from the impact on consumer disposable income and corporate investment activity. At the time of the pandemic, job losses were determined by country-specific labor market institutions, but all countries experienced historically unprecedented spikes in unemployment. Unemployment in Russia in 2020 is projected at a maximum level from 2011 to 5.7%. Starting next year, it is planned to reduce the unemployment rate: in 2021—5.4%, in 2022—4.9%, in 2023—4.7%. In the United States, initial claims for unemployment benefits have been recorded at more than 26 million since the beginning of isolation, indicating that the rate of job losses is about 10 times higher than it was after the fall of Lehman Brothers in 2008. Similarly, in the UK, 1.4 million new applications for unemployment benefits have been registered since mid-March, when the government first urged people to stay

home. Unemployment is projected to rise to almost 21% of the total labor force, which is higher than the figure recorded during the Great Depression of the 1930s.

Some aspects of the problem under study are considered in the work of Harisova and Karachurina (2019).

The number of registered unemployed may be slightly lower, taking into account informal employment. Those who lost their jobs are concentrated in the least income segments. This part of the population is forced to reduce its expenses, despite unemployment payments.

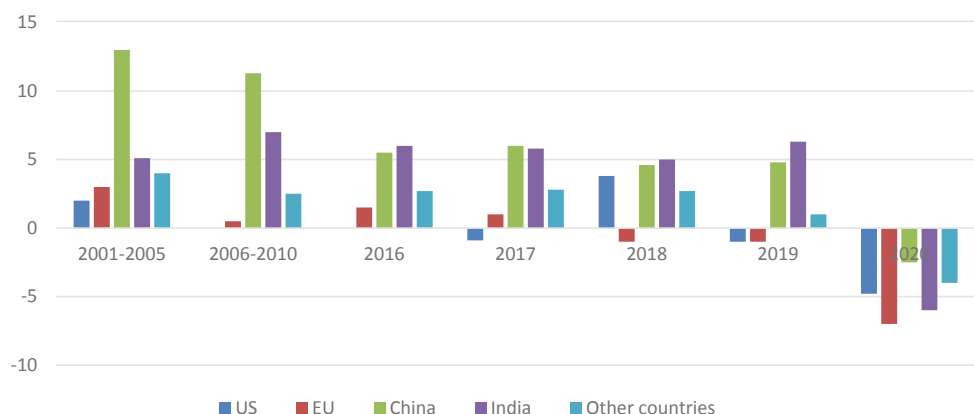
Changes in annual GDP and energy consumption depend on the duration of the isolation measures, while the indirect impact of the crisis will be determined by the recovery curve (EU Leaders, 2020).

Certain economic activities curtailed by isolation measures will be gradually restored. However, in some sectors, such as tourism, the crisis can have long-term consequences. It is predicted that tourism activities in the coming years will not even return to the pre-crisis development path; not to mention that they will quickly return to their previous dynamics.

One of the most important factors affecting the recovery of socioeconomic processes is health. Today, the possibility of a second wave of pandemic is predicted. After the isolation is removed, the economic picture in terms of indicators with reduced aggregate demand and potential burden on the financial system will be close to the recession level. The depth and duration of the recession can be significantly reduced by countercyclical demand-side policies and measures preventing side effects from triggering a systemic financial crisis (Harisova et al., 2020).

Under this scenario, economies currently in isolation are opening up gradually, and economic and social activity has been slow to resume. The economic recovery is U-shaped and is accompanied by a significant permanent loss of economic activity, despite macroeconomic policy efforts. According to the assumptions of the World Energy Agency (IEA), global GDP will decrease by 6% in 2020.

Fig. 1 Average annual growth rate of electricity demand in selected regions, 2001–2020. *Source* By the authors based on Forecasts of Socio-economic Development (2020)



The economic outlook is uncertain. The pandemic spreading trajectory is also unpredictable. The consequences and duration of measures to curb the spread of the virus, the strategies for reactivation, and the shape and speed of recovery as the pandemic recedes are uncertain. Optimistic statements about removing isolation, effectively suppressing the virus, combined with ambitious and targeted macroeconomic policies, will bring about a faster V-shaped economic recovery. However, the risks of an outbreak of infection and the introduction of the second stage of isolation measures, in the fall and winter of 2020, are increasing, which will again lead to disruptions in the supply chain.

The slowdown in transport, trade, and economic activity worldwide has led to a crisis in the energy sector. There was a sharp decrease in demand for transportation. As a result of the global restrictive measures caused by the COVID-19 crisis, transportation—57% of global oil demand—fell on an unprecedented scale in early 2020. Road transportation in the regions decreased by 50–75%, and the global average activity of road transport by the end of March almost fell to 50% of the 2019 level.

In general, renewable energy production is expected to increase over the year due to low operating costs and preferential access to many energy systems. Nuclear power is projected to decline in response to lower electricity demand (Sultanova, 2019). In 2019, low-carbon fuels accounted for the leadership in consumption, and in light of today's events, the trend continues.

Despite the fact that in most countries, isolation measures were in effect for less than a month; global electricity demand in the first quarter of 2020 decreased by 2.5%. Full isolation has reduced demand for electricity by 20% or more. Daily electricity demand in Russia, France, India, Italy, Spain, the United Kingdom, and the northwestern United States decreased by 15%. The hardest effects were felt in countries

where stringent measures were applied and where services make up the majority of the economy. As a result, energy investment is projected to decline by one-fifth in 2020 (Fig. 2).

In general, the picture of investment activity reflects a drop in activity. Serious consequences of investment in 2020 are noted in the oil industry. Lower revenues due to lower energy demand and prices increase uncertainty about these factors in the coming years (Antonov et al., 2020).

3 Results

As a result, investment strategies in the energy sector are developing in two directions:

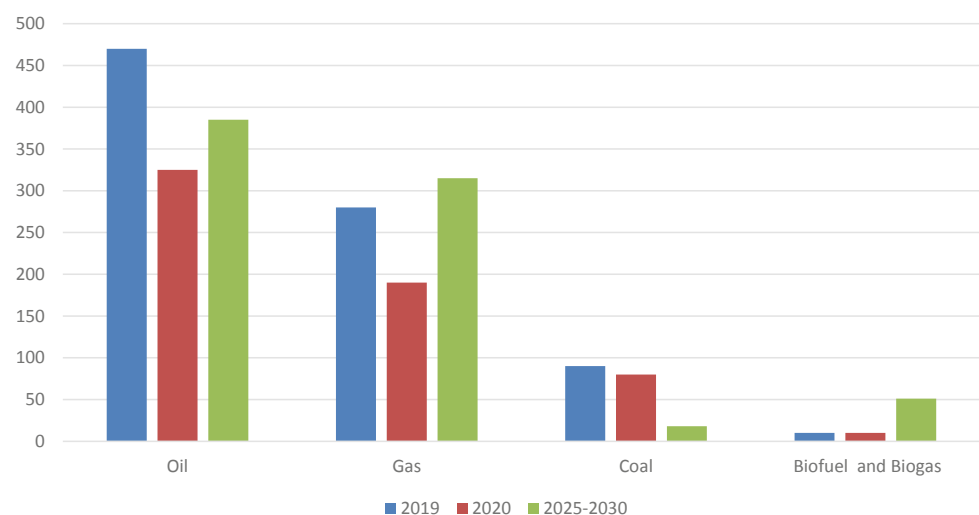
First, cost reductions are due to lower aggregate demand and lower income; these reductions were particularly severe in the oil industry, where prices collapsed;

Second, the practical disruption of investment activities was caused by isolation and restrictions on movement.

If the efforts of countries in the field of medicine and macroeconomics are effective, this will allow for a faster V-shaped economic recovery and a pronounced increase in investment activity in the second half of the year. Pessimistic projections suggest that investment costs could be further reduced if the second wave of infection at the end of the year leads to renewed restrictions. Regardless of how events evolve, policies—whether targeted at energy or the economy as a whole—will have a significant impact on the end result (Iziliaeva, 2018).

The oil market bears the brunt of the crisis as a result of reduced mobility and aviation, which account for almost 60% of global oil demand. In April, when more than four billion people around the world were in some form of

Fig. 2 Investments in the fuel supply sector in 2019 and 2020. *Source* By the authors based on Forecasts of Socio-economic Development (2020)



isolation, annual oil demand fell by about 25 Mb/day in general for the year. Oil demand fell by an average of 9 MB/day, returning oil consumption to 2012 levels. Oil prices have broken all records over the past decade. Against the backdrop of the crisis, demand for coal decreased by 8%. The recovery in demand for coal in the industry and production of China can partially compensate for the decline in demand in other countries. The change in gas demand in the first quarter of the year was more uniform and amounted to 2% on an annual basis, since the crisis did not affect the sectors of the economy that consume gas, but there is a further downward trend.

4 Discussion

The situation, in which all countries are right now, requires a comprehensive analysis of the energy market. The economic crisis from the fuel market is turning into a political plane. All of the above factors indicate increased competition between countries in the energy supply market. There is an active change in the structure of suppliers and consumers. In light of world crisis events, a sharp increase in the variability of the external environment and the insufficient base of scientific and methodological developments, an assessment of the level of competition will clarify forecasts. Using a complex method with an entropy coefficient showing the average share of firms operating in the market, weighted by the natural logarithm of its inverse value, it is possible to present more specific forecasts for the energy industry. The entropy index reflects the unevenness of overall sales in the industry.

Entropy index calculation formula:

$$E = \sum_{i=1}^n Y_i \ln 1/Y_i, \quad (1)$$

where Y_i —market share, i —of the company, n —number of companies in the industry.

The integrated method will allow the use of all factors present in global energy markets. As a result, to date, taking into account the current dynamics of changes in the external environment, a comprehensive assessment of the level of competition is most appropriate. It is also necessary to take into account the specifics of each particular market and choose the valuation method in accordance with the specifics. In turn, it is important to assess the degree of influence of the state on the level of competition in the industry. Assessment of the level of competition and its further analysis allows us to make judgments about the attractiveness of the industry for investment, determine future threats, and opportunities, as well as predict the development of this market as a whole.

Today, there is no certain methodology for assessing the level of competition taking into account existing factors. There is difficulty in obtaining accurate empirical data, timely, and up-to-date information. Since the concept of competition is strategically important and multifaceted, it is impossible to evaluate it by one factor; it is necessary to consider and analyze a set of indicators. One of the general indicators of this situation is, on average, a 25%—decrease in energy demand for countries in complete isolation and, on average, an 18%—decrease for countries in partial isolation.

The impact of the pandemic has proved to be catastrophic for energy systems and has accelerated the transition to clean energy. Of particular, relevance to all states today is as follows:

- Energy security and sustainable energy systems, which are more necessary than ever for modern society;
- Energy security as a major factor in economic development, especially in fragile situations;
- Focus on clean energy development in economic recovery and stimulus plans, safe and sustainable energy systems (Sopova, 2016).

5 Conclusion

Governments around the world are using fiscal and monetary incentives to restore economic stability. Economic and social recovery will also be greatly influenced by the scope and structure of macroeconomic policies (Azojev, 2006). The focus is now on providing direct income support to both affected workers and companies to minimize social impact. At the same time, the stabilization of the financial system is a priority. Despite the globalization of economic and political responses, recovery will not be as rapid. 2020 could be the year of the deepest post-war recession, markedly exceeding the 2008 financial crisis (Exploring the Impacts of the COVID-19, 2020). In 2021, global economic activity may be lower than 2019.

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