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2020 Global Energy Situation Indicated by BP Statistics

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On July 8, international oil company BP PLC released its "BP Statistical Review of World Energy 2021." As noted in nine past editions of this report, the BP statistics are one of the world's most representative annual energy supply and demand statistics. Energy stakeholders in the world refer to the BP statistics known for comprehensive coverage of the latest annual data. In the following, I would like to review the 2020 international energy situation based on the data.

First, the most important point of the 2020 international energy situation is that the unprecedented impacts of the COVID-19 pandemic rattled the world and directly hit energy markets. This was typically indicated by an unprecedentedly steep decline in global primary energy consumption. In 2020, global primary energy consumption plunged by 4.5% from the previous year to 556.6 exajoules (EJ). Energy consumption is indispensable for living and economic activities in human society and usually expands under economic and population growth in the world. In the past half century, global energy consumption decreased from 1980 to 1982 under a global recession triggered by the second oil crisis and in 2009 under the global financial crisis. In other years before 2020, global primary energy consumption followed an uptrend. The 4.5% plunge in 2020, the third drop in the past half century, indicated the enormous impacts of the COVID-19 pandemic. Of the two earlier declines, the 1.5% drop in 2009 was larger. The 2020 drop tripled the 2009 decline, representing the largest drop since the end of World War II.

Second, a region-by-region breakdown of the global energy consumption decline clearly indicates the impacts of the pandemic. The Organization for Economic Cooperation and Development accounted for 70% of the 2020 global decline of 24.9 EJ or 4.5%. This reflects the serious social and economic impacts of the COVID-19 pandemic on OECD advanced economies including the United States and European countries. OECD primary energy consumption posted a 7.7% plunge, far faster than a non-OECD decline of 2.4%. This represents enormous economic impacts and the effects of urban lockdowns forced in Western countries. Among countries, the United States recorded the largest decline of 7.1 EJ or 7.7%, followed by 1.9 EJ or 5.9% for India, 1.6 EJ or 5.5% for Russia and 1.3 EJ or 7.5% for Japan. The European Union as a region showed a drop of 5.0 EJ or 8.5%. The four countries and the European Union accounted for 68% of the global primary energy consumption decline. Europe, the United States, India and Russia, which are among major energy consumers and the world's most pandemic-affected economies, became the center of the global energy consumption plunge. In contrast, China, known as the world's largest energy consumer, expanded primary energy consumption by 2.1% to 145.5 EJ as it took the initiative in overcoming the COVID-19 pandemic. While global energy consumption declined substantially, China minimized social and economic impacts of the COVID-19 pandemic and increased energy consumption. China thus raised its share of global primary energy consumption by 2 percentage points to 26% in 2020, becoming more important in international energy markets.

Third, fossil fuel consumption centering oil consumption declined substantially. While the global economy plunged into the worst situation since the Great Depression, lockdowns were forced to severely restrict demand for human and goods mobility and economic operations to prevent COVID-19 infections from spreading. As a result, overall energy demand fell substantially mainly in Europe and the United States. Particularly, mobility demand decreased dramatically. The mobility demand plunge, including a steep fall in international air transport demand, affected oil consumption. Global oil consumption in 2020 posted a 9.7% plunge from the previous year, the fastest fall in the past half century. As explained below, the dramatic oil consumption decline caused oversupply and price falls in the international oil market, leading to a record oil production cut by the Organization of the Petroleum Exporting Countries and its allies known as the OPEC-plus group, as well as a steep drop in U.S. shale oil production. Global natural gas consumption in 2020 decreased by 2.3% from the previous year after sustaining a steady increase over a long term. The year's coal consumption also plunged by 4.2%. As a result, oil's share of global primary energy consumption in 2020 dropped by 2 percentage points from the previous year to 31%. Fossil fuels' share declined from 84% to 83%. Non-fossil energy sources' share rose to 17%. Particularly, renewable energy consumption (excluding hydro) expanded by a substantial 9.7% to 31.7 EJ. Factors behind the renewable energy consumption increase even amid an overall energy consumption decrease might have included a fast fall in solar photovoltaics and wind power generation costs, growing solar PV and wind power generation capacity under the falling costs, priority supply access to power market given to renewable energy power generation in many countries and a competitive edge for renewable energy power generation featuring the near-total absence of variable costs in a competitive wholesale electricity market. Nuclear energy consumption in 2020, though increasing in developing economies, posted an overall decrease from the previous year as nuclear power generation dropped in major markets such as Japan, the United States and Europe.

Fourth, global energy-related CO_2 emissions declined substantially amid the abovementioned changes in energy supply and demand. Global CO_2 emissions in 2020 totaled 31.98 billion tons, down 6.3% from the previous year. The percentage drop tripled the previous largest fall in the past half century of 2.1% recorded in 2009. The 4.5% decline in global primary energy consumption was coupled with the dramatic drop in fossil fuel consumption including oil and the increase in non-fossil energy consumption to bring about a substantial decrease in CO_2 emissions, indicating a great impact of the COVID-19 pandemic on CO_2 emissions. The CO_2 emission decline represents a positive effect on climate change prevention but has resulted from massive adverse effects on economy and society. At a time when global demand for energy including fossil fuels is restoring an uptrend, however, we must acknowledge that it would not be easy to sustain a substantial decline in CO_2 emissions over a long term. If the annual CO_2 emission cut of 6.3% is sustained over three decades, global CO_2 emissions may decline by more than 85%. The CO_2 emission reduction pace under the serious COVID-19 pandemic would have to be sustained over three decades to bring about an emission cut of more than 80%, indicating that it would a difficult challenge to cut global CO_2 emissions substantially and sustainably.

Fifth, the year 2020 featured a free fall in energy prices amid the substantial energy demand decrease and growing oversupply in its first half. In a symbolic development, the front-month futures contract for West Texas Intermediate crude oil plunged into minus territory. Spot natural gas and LNG, and coal prices also posted sharp declines. In response to the oil price plunge, the OPEC-plus group launched a record coordinated oil production cut and has sustained it to date. The oil price drop led to a fast decline in high-cost U.S. shale oil production. The price plunge stimulated energy demand, prompting Asian LNG demand to increase in the second half of 2020.

Overall energy prices rose back in the second half. As energy markets responded to the dramatic impacts of the COVID-19 pandemic in the first half of 2020, energy supply and demand were rebalanced in the second half.

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