

2021 World Energy Situation Indicated by BP Statistics

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On June 28, international oil company BP PLC released its “BP Statistical Review of World Energy 2022.” As noted in 10 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 data. In the following, I would like to review the 2021 international energy situation based on the data.

First, the most important point of the 2021 international energy situation is that the world recovered from the unprecedentedly huge adverse impacts of the COVID-19 pandemic that rattled the world, leading to dramatic international energy situation changes including demand expansion. In 2021, global primary energy consumption increased by 5.8% from the previous year to 595.2 exajoules (EJ). After posting a 4.2% plunge due to global economic contraction and lockdowns implemented to prevent COVID-19 infections in 2020, global primary energy consumption rebounded from the decline and expanded rapidly in response to economic recovery and the lifting of travel restrictions. The increase of 5.8%, though including a reaction to the plunge in the previous year, was the largest in the 21st century. The increase led global primary energy consumption to expand by 1.3% from 587.4 EJ in 2019 before the COVID-19 pandemic. In 2021, international energy markets broke away from the impacts of the COVID-19 pandemic and came back to a growth path.

Second, both developed countries in the Organization for Economic Cooperation and Development and developing and emerging, or non-OECD, countries scored robust growth in primary energy consumption, but non-OECD consumption increased remarkably in a manner to drive global growth. Non-OECD primary energy consumption in 2021 posted a sharp increase of 6.5% from the previous year to 365.3 EJ, accounting for about 70% of the global growth at 31.1 EJ. In particular, China and India boosted energy consumption remarkably. Growth from the previous year came to 10.1 EJ or 7.1% for China and 3.2 EJ or 10.4% for India. The two countries alone accounted for more than 40% of global growth. On the other hand, OECD primary energy consumption in 2021 increased by 4.7% from the previous year to 229.9 EJ. The COVID-19 pandemic exerted great impacts on the OECD group of developed countries, which posted an unprecedented decline of 7.5% in energy consumption in 2020 before the sharp recovery in 2021. Non-OECD countries accounted for 61% of global primary energy consumption in 2021, against 39% for OECD countries, indicating that the gravity center of global energy consumption shifted further to the non-OECD world including Asian countries.

Third, global energy consumption by source in 2021 showed that fossil fuel consumption including oil, natural gas and coal recovered from a substantial decrease in the previous year, scoring robust year-on-year growth. Consumption in 2021 rose by 6.1% for oil, by 5.3% for natural gas and by 6.3% for coal. Oil and coal consumption, which captures the first and second largest shares of global energy consumption, scored larger increases than the overall primary energy consumption rise

of 5.8%. This means that the COVID-19 pandemic's impacts on oil and coal in 2020 were enormous, contributing to the oil and coal consumption growth in 2021. OECD oil consumption in 2021 posted a 6.5% increase, faster than a 5.7% rise in non-OECD consumption. This is because the decline in OECD consumption in 2020 was as sharp as 12.9%. In fact, OECD oil consumption in 2021, though increasing by 6.5% to 83.6 EJ, fell far short of restoring the 2019 level of 90.2 EJ. OECD oil consumption recovery was still halfway. Among non-fossil energy sources, renewable energy continued consumption growth even under the pandemic in 2020 and posted a steep consumption increase of 15.0% in 2021. Nuclear energy consumption registered a 3.8% increase, driven by growth in non-OECD countries such as China. As fossil energy consumption was robust in 2021, fossil energy sources' share of global energy consumption rose slightly from the previous year to 82%. Over the long term, however, the fossil energy share has continued a moderate downtrend.

Fourth, the abovementioned energy supply and demand changes brought about dramatic changes in global energy-related CO₂ emissions and international energy prices in 2021. Global CO₂ emissions in 2021 increased by 5.9% from the previous year to 33.88 billion tons. The growth was larger than the primary energy consumption increase of 5.8% under the influence of the sharp fossil energy consumption growth. After recording the sharpest decline in a half century, CO₂ emissions showed a reactionary increase in 2021, almost restoring the 2019 level. In 2020, CO₂ emissions decreased by 6.2%. If CO₂ emissions continue to fall at this pace over three decades, they may decline by more than 80%. The resumption of CO₂ emission growth in the course of economic recovery from the COVID-19 disaster indicates how difficult it would be to sustain substantial CO₂ emission cuts over a long term. After energy oversupply and weak energy prices under the disaster in 2020, the energy supply-demand balance tightened in 2021, leading energy prices in international markets to shoot up. The average key futures price for Brent crude oil in 2021 came to \$70.91 per barrel, up nearly \$30/bbl from \$41.84/bbl in 2020. In the second half of 2021, particularly, the price topped \$80/bbl and rose close to \$100/bbl. Natural gas and LNG also posted remarkable price hikes. The Dutch Title Transfer Facility price, or the European benchmark for natural gas, averaged \$16.02 per million British thermal units in 2021, skyrocketing more than five-fold from \$3.07/MMBtu in the previous year. The average Asian LNG spot price shot up to \$18.60/MMBtu from \$4.97/MMBtu. Coal prices also soared sharply. The electricity supply-demand balance tightened in a manner to push up electricity prices in Europe and China, attracting global attention.

Fifth, the Ukraine crisis started in 2021, accelerating the abovementioned energy price hikes. Its full-blown impacts on international energy markets emerged in 2022, leading energy interdependence between Europe and Russia to become a major factor to rattle international energy markets. The following summarizes energy relations between Europe and Russia in 2021. Oil consumption in Europe (including the European Union as well as the United Kingdom, Turkey and other non-EU countries) totaled 13.53 million barrel per day. Given local production at 3.42 million bpd, Europe depended on imports for 75% of its oil supply. Europe's rate of dependence on imports was also as high as 63% for natural gas and 42% for coal. Particularly, its rates of dependence on imports for oil and natural gas, the first and second largest energy sources, were extremely high. The Russian share of total European imports in 2021 fell slightly from 2020 to 32% for oil, 54% for gas (pipeline gas and LNG combined) and 48% for coal. Russia was Europe's largest energy import source. At the same time, Europe was Russia's largest energy export destination with the share of export to Europe in total Russian export at 53 % for oil, 76% for gas and 35% for coal. Russian exports' share of global supply came to 12% for oil (the highest in the world), 24% for gas (the highest) and 18% for coal (the third highest). Russia was the world's largest fossil fuel exporter. The deep energy interdependence between Europe and Russia along with Russia's great presence in international energy markets have become key background factors behind the seriousness of the Ukraine crisis.