

2023 International Energy Situation as Seen from EI Statistics (1): Energy Consumption

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On June 20, the Energy Institute, a London-based international organization of energy industry stakeholders, released “The Energy Institute (EI) Statistical Review of World Energy 2024.” The annual statistics were published as BP statistics before the EI replaced BP as the publisher of the representative energy statistics in 2023. As introduced 12 times in this essay series in the past, the former BP statistics and the current EI statistics are among the most representative annual statistics on international energy supply and demand. Energy industry stakeholders refer to the statistics as comprehensive and up-to-date data. As in the past, the statistics are available for free access.

One year after Russia's military invasion of Ukraine rattled the international energy situation, new developments were observed in the international energy market in 2023. In order to decipher the situation from various angles based on the EI statistics, I would like to review the characteristics of the international energy situation in 2023 in three parts. The first part focuses on global energy consumption trends in 2023.

First, global primary energy consumption in 2023 totaled 619.6 exajoules, up 2.0% or 12.3 EJ from the previous year. It plunged by 3.5% in 2020 due to the COVID-19 pandemic before rebounding by 5.1% in 2021. In 2022, it showed a steady increase of 1.8% despite the outbreak of the Ukraine crisis. In 2023, the world continued to see a steady increase in energy consumption amid economic and population growth. The 2.0% increase in 2023 was higher than the average rise of 1.4% in the last 10 years (2013-2023). Although Russia's military invasion of Ukraine is still ongoing and likely to be prolonged and stalemated, global energy consumption is showing a steady upward trend even after the seismic shock to the international energy situation in 2022.

Second, a region-by-region breakdown of global primary energy consumption showed that the Asia-Pacific region saw a remarkably high increase of 4.7%, followed by a 3.1% rise in the Middle East and Latin America, surpassing the global average. In contrast, Europe, which was suffering from an economic slump following the outbreak of the Ukraine crisis, posted a 2.2% fall in energy consumption after a 4.1% decline in 2022. Energy consumption in North America also declined by 1.0% in 2023. In the United States, the largest energy market in North America, energy consumption decreased partly due to a significant drop in coal consumption. Energy consumption increased by 0.7% in the former Soviet Union and by 0.4% in Africa. Energy consumption changes in 2023 thus varied greatly by region.

In 2023, the Asia-Pacific scored the largest energy consumption increase of 4.7%, with its consumption volume growth at 13.0 EJ topping the global net rise of 12.3 EJ. The region thus drove the global energy consumption growth. Moreover, a closer look at consumption trends in the Asia-Pacific reveals that consumption growth in China and India was crucial. In 2023, China's primary

energy consumption increased by 6.5% or 10.5 EJ, while India's increased by 7.3% or 2.6 EJ. The combined consumption increase of 13.1 EJ for the two countries was slightly higher than the net rise for the Asia-Pacific as a whole. It is no exaggeration to say that the two countries drove the global energy consumption growth in 2023. Particularly, China's energy consumption growth alone accounted for 85% of the global increase, indicating how influential China was for the global primary energy consumption increase in 2023. As a result of these consumption trends, primary energy consumption in the member countries of the Organization for Economic Cooperation and Development in 2023 decreased by 1.6%, while non-OECD energy consumption increased by 4.3%. The OECD accounted for 37% of the global primary energy consumption, against 63% for the non-OECD world. The Asia-Pacific commanded 47% of the global consumption. In 2023, the non-OECD world and the Asia-Pacific boosted their importance for global energy consumption even further.

Third, global energy consumption by energy source showed that oil, which accounts for the largest share of primary energy consumption, posted a 2.5% consumption increase that exceeded the 2.0% rise in overall primary energy consumption. Oil consumption grew in all regions other than Europe with a 0.9% decrease and Africa with a 0.1% drop. Remarkably, the Asia-Pacific scored a significant increase of 5.5%. China in the region boosted oil consumption by 10.9%, driving global oil consumption growth. Coal, the second largest energy source after oil, also showed a steady consumption increase of 1.6% in 2023. As the importance of stable energy supply at affordable prices grew, the Asia-Pacific, which accounts for 83% of global coal consumption, posted a significant coal consumption increase of 4.5%, contributing much to global growth. China and India, the world's first and second largest coal consumers, increased coal consumption by 4.7% and 9.8%, respectively. The two countries alone accounted for 70% of global coal consumption, leading the global consumption growth. Global consumption of natural gas, the third largest energy source, leveled off in 2023. Although the Asia-Pacific and North America, which are the main natural gas consumers, expanded natural gas consumption by 1.6% and 1.0%, respectively, these increases were offset by a sharp decline of 6.9% in Europe, which enhanced efforts to phase out dependence on Russian gas and suffered from a sluggish economy.

Among non-fossil energy sources, renewable energy continued to post a significant consumption increase. As solar photovoltaics and wind power consumption continued to expand, renewable energy consumption other than hydro in 2023 recorded an increase of 12.1%. All regions scored renewable energy consumption growth. Among them, the Asia-Pacific as the largest renewable energy consumer posted a 17.3% increase. Even in Europe, where natural gas consumption declined significantly, renewable energy consumption recorded a significant rise of 7.3%. China, the world's largest renewable energy consuming country, saw a remarkable increase of 20.8%. Global nuclear power generation increased by 1.8% in 2023. After declining by 4.7% in 2022 due to a drop in Europe (including France and Germany), global nuclear power generation grew in 2023 thanks to a rebound in France and a robust increase of 3.7% in China, the world's second largest nuclear power after the United States. As a result, oil accounted for 31.7% of global primary energy consumption, coal for 26.5%, natural gas for 23.3%, renewable energy for 8.2%, hydro for 6.4%, and nuclear energy for 4.0%. Fossil fuels' share of the global primary energy consumption fell slightly from 81.7% in 2022 to 81.5% in 2023.

Fourth, as a result of these energy consumption trends, global energy-related CO₂ emissions increased by 1.6% to 35.13 billion tons. The increase was higher than the average rise of 0.7% over the last 10 years. The steady increase in oil and coal consumption contributed to the increase in CO₂ emissions. By region, Europe saw a significant reduction of 6.2% in CO₂ emissions. North America posted a 2.5% decrease. However, the Asia-Pacific, the world's largest CO₂ emitter, recorded a

significant increase of 4.7%, contributing to the global emission growth. CO₂ emissions in China and India, where coal consumption expanded, increased by 6.1% and 8.4%, respectively. The two countries' combined emission increase of 860 million tons far exceeded the global net increase of 550 million tons, more than offsetting the decreases in Europe and the United States.

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