

China's Dominance in Renewable Energy

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The primary elections for the U.S. presidential election in November have started. In the first contest for the Republican presidential nomination that came in Iowa on January 15, former President Donald Trump won a landslide victory with 51% of the vote, followed by Florida Governor Ron DeSantis (21%) and former U.N. Ambassador Nikki Haley (19%). The results demonstrated once again that Trump's popularity is alive and well. While it is interesting to see how the race for the Republican nomination will turn out in the future, including the outcome of the next Republican primary in New Hampshire, Trump's dominance may increase.

At the outset of long presidential election campaigns where the Republican and Democrat candidates will be nominated toward the November election, it is impossible to predict who will be the next president. However, the first Republican contest in Iowa reminded the world of the possibility of Trump being elected U.S. president again. If Trump is elected, there will likely be a major shift in U.S. policies on various issues such as climate change. However, another issue that I am paying attention to is whether policies and strategies based on the concept of "energy dominance" advocated during the Trump administration will come back.

The definition of "energy dominance" is not necessarily clear. It may be defined as an idea to increase the influence of the United States on oil as the world's largest energy trade good and gas as the second largest through their massive increase in production and exports and take advantage of the influence for maximizing U.S. national interests. As known well, a factor behind the U.S. energy dominance has been a significant increase in U.S. oil and gas production under the shale revolution that lasted for about 10 years from the latter half of the 2000s. The Biden administration, which has placed the top priority on climate change policy and sometimes taken a cold stance on fossil fuels, has been reminded of the importance of U.S. oil and gas production amid soaring energy prices, the Ukraine crisis, and Europe's response to an energy crisis. As liquefied natural gas production is expected to continue expanding in the United States, it is interesting to see how energy dominance policies and strategies will be positioned under the next president.

However, energy dominance is not limited to the United States. There are other dominant players in the international energy market. For example, the OPEC-plus group of oil-producing countries is a dominant player in the international oil market, exerting great influence on supply and demand adjustment in the market. The group includes Saudi Arabia, which has the world's largest surplus oil production capacity and is in a particularly noteworthy position. In addition, Russia has been a dominant player with strong influence on the international energy market, particularly the European market, as demonstrated by the Ukraine crisis. In the past energy crises and responses to them, strategic actions of these dominant players have contributed much to stabilizing or destabilizing the market.

This essay sheds new light on dominance in a new area. That is the clean energy area expected to play an extremely important role in the future energy transition. While clean energy is more diverse than fossil fuels, I would like to focus on renewable energy that is currently spreading rapidly.

Renewable energy such as solar photovoltaics and wind power generation has continued to spread significantly worldwide, thanks to a combination of enhanced policy support and a rapid decline in costs, as it is expected to contribute to improving local energy self-sufficiency, diversifying energy sources, and reducing CO₂ emissions. The world's total renewable energy power generation (excluding hydropower) expanded nearly 20 times from 217 terawatt-hours (TWh) in 2000 to 4,204 TWh in 2022. The share of renewable energy in total power generation has surged from 1% to 14% over the same period. As of 2022, renewable energy was the fourth largest power generation source after coal, natural gas, and hydropower, and on track to close in on hydropower. As renewable energy is expected to continue spreading in the future, the importance of renewable energy in the energy mix is increasing.

It is well known that China has driven the spread of renewable energy, which is becoming increasingly important. China's total renewable energy power generation was only 3 TWh in 2000. However, the expansion since the 2010s has been tremendous, boosting it to 1,367 TWh in 2022, with China becoming the world's largest renewable energy power generator. China's share of renewable energy generation in the world also increased dramatically from 1% to 33% over the same period. As of 2022, China's share of wind power generation, the largest in renewable energy generation, was 36%. Its share of solar PV generation in the second place stood at 32%. China's presence in renewable energy power generation is thus distinguished. China's renewable energy policy and strategy and the efforts of related industries under them over the past decades have brought about remarkable growth and high global share.

Even more interesting is China's dominance in the current move to spread renewable energy. According to an analysis published by the IEEJ late last year (Yasushi Ninomiya, "2024 Renewable Energy Policy Challenges"), it is clear that China and solar PV are driving the current expansion of renewable energy power generation capacity as a whole. For example, the growth of renewable energy generation capacity in China alone during 2023 was 263 gigawatts, accounting for about 60% of the global increase of 455 GW. Incidentally, solar PV commanded more than 70% of the increase in China. In the world outside of China, solar PV accounted for more than 70% of a 192 GW increase in renewable energy power generation capacity in the same year. It should be noted here that China accounts for 80-90% of global wafer and cell production for solar PV. Even in the world outside of China, the expansion of renewable energy capacity centers on solar PV, with China being deeply involved in solar PV equipment production.

In the world outside of China, growth in renewable energy capacity excluding solar PV in 2023 was limited to 52 GW. In fact, the annual increase has remained unchanged at around 50 GW over the past 10 years. Renewable energy capacity excluding solar PV in the world outside of China has grown at the constant annual pace of some 50GW, failing to accelerate growth. This indicates that the continued solar PV cost reduction in China's domestic supply chains has brought about these results. China's dominance in solar PV capacity is thus distinguished in the renewable energy field.

It should be noted that, unlike oil and gas, which are major commodities for international trade, renewable energy electricity is not a major international trade good. In this sense, dominance in renewable energy is different from that in oil and gas. In order to increase renewable energy power

generation capacity, however, the world structurally depends on Chinese equipment and supply chains, as mentioned above. At the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change known as COP28, the global goal of tripling installed renewable energy capacity by 2030 was given. A significant increase in Chinese capacity will be important for achieving the goal. If solar PV leads to renewable energy capacity growth in countries other than China, those countries will have to indirectly depend on Chinese solar PV equipment manufacturing facilities to achieve the goal. Here, China will thus hold the key. Regarding overall clean energy investment covering electric vehicles and batteries in addition to renewable energy, demand for rare earths and other critical minerals is expected to increase substantially. Given that China has a dominant share of global rare earth supply chains, China's dominance in critical minerals is also distinguished. Countries other than China are thus required to diversify critical mineral supply sources, conserve and recycle resources, and expand strategic stockpiling to address potential problems regarding Chinese dominance. They will have to develop their best energy mixes in consideration of these problems and relevant risks and costs.

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