A Brief Update on China's Coal Fleet

August 31, 2021

Our last blog about China's coal fleet was written a few months ago. Some of the information was preliminary at the time, and additional data have been published since then. Hence, we thought it would be useful to highlight some of the additional information, especially in light of the upcoming 26th U.N. Climate Change Conference (COP 26) in mid-November. The information in this blog comes from Global Energy Monitor (February and April 2021),[i] BloombergNEF (July 2021),[ii] Rhodium Group (May 2021),[iii] International Energy Agency (December 2020 and July 2021),[iv] Energy Information Administration,[v] and U.S. EPA (July 2021).[vi]

One of the takeaways from the previous blog was that China's coal fleet — already the largest on the planet — was growing even larger. In fact, eliminating the entire U.S. coal fleet would be more than offset by just the increase in coal capacity in China. Another new development is that China's greenhouse gas (GHG) emissions, for the first time, exceeded the combined GHG emissions of all 41 developed countries.

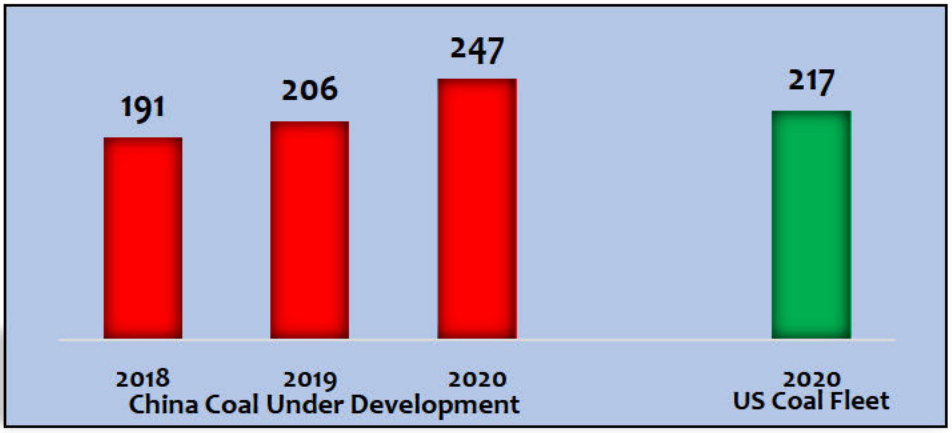
China emits 27 percent of global GHG emissions, which makes it the world's largest emitter by far.

- Global anthropogenic GHG emissions are estimated to have been 52 billion metric tons (tonnes) CO2-equivalent in 2019, an 11.4 percent increase over the past decade.
- China was the world's largest GHG emitter at 14.1 billion tonnes, which represents 27 percent of global emissions. China's emissions increased by 25 percent over the past decade and now exceed the combined emissions of the 41 developed countries (European Union and OECD, plus the U.S. and 13 other countries).
- The U.S. was second at 6.56 billion tonnes in 2019, which represents 11 percent of global emissions. U.S. GHG emissions have declined from 7.43 billion tonnes in 2005 to 6.56 billion tonnes in 2019, a drop of almost 12 percent. U.S. electric sector emissions declined from 2.4 billion tonnes to 1.61 billion tonnes, a reduction of 33 percent over the same period.
- Other major emitters are India (6.6 percent), EU (6.4 percent), Indonesia (3.4 percent), Russia (3.1 percent), Brazil (2.8 percent), and Japan (2.2 percent).

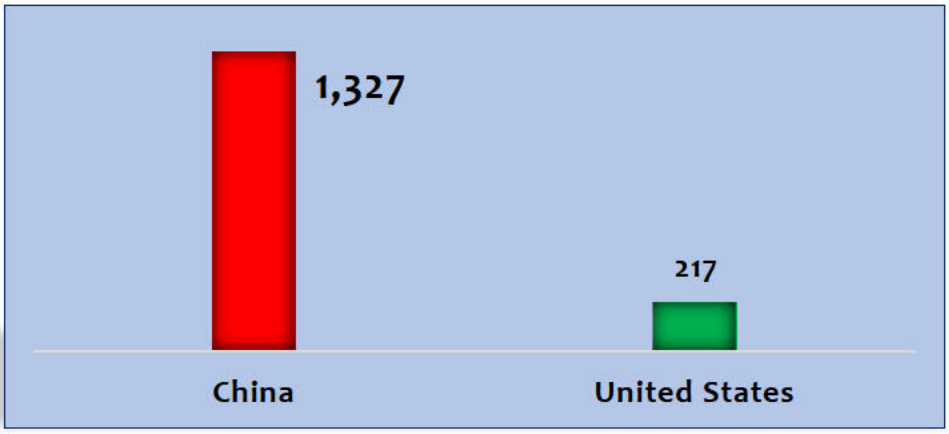
China has more than half the world's coal-fired electric generating capacity, and its coal fleet continues to grow. According to the International Energy Agency, "… it seems likely that [China's] coal capacity will increase until 2025 and then plateau before it starts falling."

- In 2020, China's coal fleet increased by a net 19 gigawatts (GW) (new plants minus retirements), bringing the size of China's fleet to 1,080 GW. (One GW equals 1,000 megawatts (MW), making China's coal fleet 1,080,000 MW.)

- China's existing fleet represents slightly more than half the world's coal-fired generating capacity (2,115 GW).
- China's existing coal fleet is as large as the entire U.S. electricity supply (natural gas, coal, oil, nuclear, and renewables), which totals some 1,100 GW.
- The U.S. coal fleet totals 217 GW of electric generating capacity. Therefore, China's coal fleet, which is growing, is already more than five times the size of the U.S. coal fleet.
- China also has 247 GW of coal-fired generating capacity (478 generating units) under development (under construction, permitted, or announced). This is an increase of almost 56 GW over 2018.
- The chart below shows the amount of coal-fired generating capacity (GW) in China (red) that was under development in 2018, 2019, and 2020 and compares that to the size of the U.S. coal fleet (green). (The figures for China are cumulative, not additive.)



- The chart below compares the total coal-fired generating capacity (GW) in China (existing plus under development) and the U.S. (existing and none under development). China's coal fleet would be six times the size of the U.S. coal fleet if the capacity under development is completed.



China consumes more coal than the rest of the world combined.

- China's coal demand is projected to be 3.875 billion tonnes this year, an increase of 61 million tonnes over 2020.
- This figure represents 52 percent of global coal demand.
- U.S. coal demand is projected to be 487 million tonnes, making China's coal demand eight times greater than the U.S.
- China's coal demand increased by 82 million tonnes over 2018 levels, whereas U.S. demand declined by 132 million tonnes since 2018.

Final thoughts.

China emits more than 14 billion tonnes of GHGs; the U.S. emits less than 7 billion tonnes. China pledged to *stop increasing* its carbon emissions by 2030. By contrast, the Biden administration has committed the U.S. to *reducing* carbon emissions by 50-52 percent by 2030. If it meets its pledge, China will stop increasing emissions by about the same time the U.S. will have cut its emissions by half.

And don't forget that 503 GW of coal-fired generating capacity are under development worldwide. Based on the average size of a coal-fired generating unit today, that amounts to more than 1,000 new coal-fired generating units that are in the global pipeline. An unknown number of these will never be built, but it's still an indication that coal will be part of the global energy mix for the foreseeable future.

---

[i] Global Energy Monitor (and others), "China Dominates 2020 Coal Plant Development," February 2021, and "Boom and Bust 2021 – Tracking the Global Coal Plant Pipeline," April 2021.
[ii] BloombergNEF (BNEF), "New Energy Outlook 2021," July 2021.
[iii] Rhodium Group, "China's Greenhouse Gas Emissions Exceeded the Developed World for the First Time in 2019," May 6, 2021. https://rhg.com/research/chinas-emissions-surpass-developed-countries/
[iv] International Energy Agency, "Coal 2020," December 2020, https://www.iea.org/reports/coal-2020, and "Electricity Market Report," July 2021.
[v] Energy Information Administration, "Annual Energy Outlook 2021."
[vi] U.S. EPA, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019," April 2021 https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions