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How to reconcile China leading in renewable energy capacity and in CO2 emissions

China is a leader in building renewables capacity and in greenhouse gas emissions. Given this contradiction, how can one make sense of the country's environmental performance? Mathias Larsen argues that this debate needs to take nuance into account. China's emissions may already have peaked and could fall rapidly, despite its continued investments in coal.

When considering China's climate performance, it is perhaps no surprise that opinions diverge. The country's record-breaking development of green industries and equally record-breaking greenhouse gas emissions are well known and with good reason. China dominates all key green industries and **installs** more renewables each year than the rest of the world combined. Yet it burns more than half of the world's coal and is home to **90 per cent** of additional emissions since COP21, the landmark 2015 climate change summit in Paris.

Some researchers emphasise China's green credentials. Economist Jeffrey Sachs, for instance, **argues** that "China is undertaking a rapid transformation in energy structure" and "making the transformation possible around the globe". At the other end of the opinion spectrum, US President Donald Trump **has said**, "It costs much more to do things environmentally clean. China doesn't do anything."

If we look only at either the clean or emissions-intensive side of China's economy, we might conclude that the country is either a climate saviour or sinner. Broader political opinions on China are perhaps even more polarised, leading many to view its climate performance through pre-existing political opinions. There might be clear reasons for this polarisation, but this is not a fact-based way of comprehensively understanding the country's climate performance.

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Capacity x consumption

The dynamics in the coal industry are arguably some of the most misunderstood in the discourse on China's climate performance. To begin to understand it, we must unpick two distinct concepts: **capacity** and **consumption**.

On the capacity side, China continues to invest in new coal-fired power plants. In 2024, it started construction of **95GW** of new coal power capacity, with another 100GW in the pipeline.

On the consumption side, according to China's National Bureau of Statistics, coal use **fell** in the first four months of 2025 compared with the same period in 2024. But the total remained unchanged year-on-year because consumption in the second quarter of 2025 was higher than in the same period in 2024.

Increased capacity and stable consumption imply that the utilisation rate (the proportion of the capacity actually used) is falling. This rate was around **70 per cent** two decades ago but is now **40 per cent**. It is the official **policy** of the Chinese government to further reduce it until coal merely "supports" renewables by responding to fluctuations in supply and demand.

Coal accounts for **79 per cent** of China's emissions. Roughly **two-thirds** are used in power generation, with the remaining third used by industry, such as steel, cement and fertiliser. Industrial consumption, however, is stagnant. The reason? The slump in the real estate sector has dragged down usage for **steel** and **cement**.

Is King Coal being dethroned?

Leading researchers and non-governmental organisations have recently made several findings. Greenpeace East Asia **reports** that China is in a position to peak its coal power emissions in 2025, which will entail almost one trillion renminbi in savings in the long term. Other researchers **argue that** while China is scaling up coal capacity, the utilisation rate has been falling. As that is likely to continue, overall coal consumption may have peaked.

Another **review** finds that China's emission peak is in sight and that rapid electrification means that fossil fuel consumption is poised to start falling. Data scientist Hannah Ritchie **finds that**:

"China's emissions are now falling. I don't want to be the one who calls 'this is the peak', but I think there is a chance China's peak emissions are coming very, very soon."

These researchers all agree that even though China is unquestionably scaling up coal capacity, this does not necessarily lead to increased coal consumption and higher emissions. A clearer picture emerges. While increasing coal capacity suggests dependence on carbon, the decreasing use rate indicates that renewables are outcompeting even new coal plants.

The need for nuance

How should these dynamics inform opinions about China's climate performance? The key here is *uncertainty* around how China's emissions will evolve over the next decade. The fundamental situation is that renewables increasingly meet the entire growth in energy demand.

In 2024, **84 per cent** of the country's energy demand increase was met by renewables, while this reached **102 per cent** in the first half of 2025, consequently reducing fossil fuel consumption. This is a key reason why coal **consumption** has fluctuated at around the same level for a decade.

Specifically, emissions from coal consumption only increased by **eight per cent** between 2013 and 2022, while the size of China's economy doubled over the same period.

Based on this situation, two dynamics are central for future predictions.

First, if renewables installation continues at the current pace while the speed of the increase in energy demand stays around the past decade's average of **five per cent**, then renewables will begin to rapidly cut into coal consumption.

This seems likely, as renewables installation has continuously broken **records** year after year. The **China Electricity Council** and **State Grid** expect this to continue in 2025, in spite of recent pricing reforms that some believed would slow down installations.

Second, suppose prices of renewables and battery storage continue to fall. This has indeed been the case in **recent years**. In that case, their combined costs become cheaper than the marginal cost of burning coal in an existing coal plant, also leading to a rapid reduction in coal consumption.

These two dynamics are uncertain, but entirely possible. If they do not happen, China might experience a peak and then a long stagnation in emissions. With **31 per cent** of global carbon dioxide emissions coming from fossil fuels in 2022, this is incompatible with the Paris Agreement.

Conclusion

Uncertainty, by its nature, suggests that China could be on the verge of either a plateau or a rapid decline in emissions. Grasping how to understand likely future trends should be a central research topic when investigating China's green transition.

I cannot provide a clear answer to the question of whether China is a climate leader or a laggard, but that is not the right question to ask in the first place. I hope to have provided at least part of the nuance needed to hold an informed opinion on the topic. From this, it follows that an informed opinion cannot be at either end of the currently polarised spectrum. Rather, it needs to put *uncertainty* at its core.

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