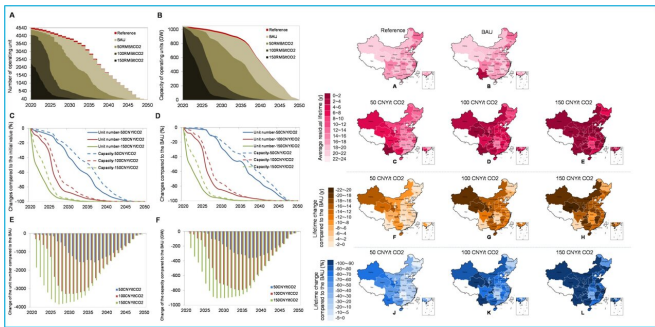


Upcoming national carbon pricing accelerates energy transition away from coal power

21 June 2021, by Zhang Nannan



The carbon pricing effect on the coal plant unit number, coal power capacity, and the expected lifetime in China's 29 provinces, autonomous regions, and municipalities. Credit: CASISD

The implementation of national carbon pricing means that coal plant managers may have to pay for carbon emissions from power generation, leading to higher generation costs, and they may suffer losses in future and even be forced to decommission coal plants before the normal end of plants' technical lifetime.

As a country with the world's largest [coal](#) power capacity, China is attempting to build its nationwide [carbon](#) market. The upcoming national [carbon pricing](#) may provide an impetus to phase out coal power and achieve its carbon peaking and carbon neutral targets early.

A systematic evaluation of the national carbon pricing effect on phasing out China's operating [coal plants](#) has been conducted by a collaborative research team from the Institutes of Science and Development of the Chinese Academy of Sciences (CASISD), North China Electric Power University, University of Chinese Academy of Sciences, Tianjin University of Finance and Economics, and

Beihang University. This work was published in *iScience*.

The researchers collected full-sample data of China's 4,540 operating coal plant units and developed a stochastic Monte-Carlo financial model to assess the financial sustainability of the plant operation, and the lifetime change of each plant unit induced by carbon pricing was quantified.

They found that although China's operating coal plant units are young and have a long residual technical lifetime, many of their operations are close to the break-even state with the current policy and market conditions. The newly introduced carbon pricing may become "the straw that broke the camel's back."

According to the researchers, the carbon pricing effect on China's phasing out coal power are mainly determined by the carbon price evolution, carbon permit allocation methods and the pass-through of the carbon cost to the consumer.

Even with low initial carbon price of 50 CNY/tCO₂ growing at 4%/y and the permits being fully auctioned, the average residual lifetime of all the [plants](#) will be reduced by 5.43 years, and the cumulative CO₂ emission from 2020 to 2050 will be reduced by 22.73 billion ton. With the carbon price further reaching 100 CNY/tCO₂, the operating coal plant stock is expected to be phased out six years earlier.

Moreover, the disparity in the carbon pricing effect among China's 29 provinces, autonomous regions and municipalities is significant and the western regions are more vulnerable to the carbon pricing risk than the eastern regions, with the residual lifetime being shortened by between 0.34 and 15.71 years via the carbon price of 50 CNY/tCO₂.

It is proposed that potential investors should fully recognize the risk of coal plant becoming stranded assets. Financial institutions should be prudent when deciding whether to provide finance for carbon-intensive energy investment.

For the government, when they make future development plans for the energy sector (e.g., the 14th Five Year Plan during the period of 2021-2025), the carbon pricing policy and the energy policy should be coordinated with each other to avoid future large-scale stranded assets or policy failure. Moreover, it is recommended that the [local governments](#) should avoid taking the one-size-fits-all approach when making carbon-peaking and carbon-neutral targets and the roadmap should be diversified.

More information: Jianlei Mo et al, The role of national carbon pricing in phasing out China's coal power, *iScience* (2021). DOI: [10.1016/j.isci.2021.102655](https://doi.org/10.1016/j.isci.2021.102655)

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