

# Executing China's 'Transition: Impossible'

Xing Zhang, Muyi Yang and Xunpeng Shi

October 14 2022

Note: This article appeared in the Asia & the Pacific Policy Society at the Australian National University's blog, Policy Forum, on October 14 2022.

China's energy companies are all aboard the global clean power bullet train.

According to China's National Energy Administration's national power industry statistics, Chinese power generators installed 37.7 gigawatts (GW) of solar capacity from January to July 2022, up 110 percent from a year earlier.

This installation, over a period of only seven months, is roughly equivalent to India's total solar build-up since the mid-2010s and total generation capacity in New South Wales and Queensland combined in 2021-22. By the end of the decade, China is aiming to bring total wind and solar capacity to 1200 GW, a massive increase from the 635 GW it recorded at the end of last year.

But this dramatic expansion of clean power generation is still not even close to enough change to power the world's second-largest economy and its largest manufacturing industry. And if China goes before it is ready, its energy security will be in even more danger.

Since mid-July, some Chinese provincial governments have enforced power rationing across various manufacturing hubs along the Yangtze River. Sichuan province, a net power exporter on the upper reaches of the river, has been the worst affected. Provinces mostly focused their efforts on industrial users, but in some cases were forced to compel homes, office buildings, and shopping malls to cut usage too.

The immediate cause is extreme weather – the region is experiencing its worst heatwave in more than half a century, sending demand soaring.

Meanwhile, in Chongqing, a megacity in Sichuan, rainfall has been 60 percent less than the seasonal norm and 66 rivers spread across 34 counties have dried up, according to state media.

This has massively reduced the hydropower supply Sichuan relies on. At the peak of the drought, Sichuan's hydropower fell to 440 million kilowatt hours, less than half of its normal level.

Other cities and regions are affected too, because Sichuan typically exports about a third of its hydropower to other provinces, and is still doing so.

Yet, diverting this power back to locals is not an option. Much of these exports go through dedicated network facilities with limited connectivity to local grids and are backed by fixed long-term supply contracts.

Sichuan's struggles are a great example of a much deeper crisis of inflexibility in an era of transition. The availability of renewable energy is heavily linked to the availability of sunlight, the speed of wind, and water. To balance it out flexibly requires sufficient storage and network infrastructure.

China, like many other countries, doesn't have this infrastructure in place yet. After all, when China's power system was developed, it wasn't designed to handle huge variations in renewable energy. While China is not alone in this struggle, it is handling a transition of far greater scale than other countries.

As it accelerates its clean power transition, China needs to heavily invest in its power system, especially in storage and its network. This will help it respond to abrupt changes in renewable energy, especially under long-lasting, extreme weather conditions.

Of course, this is not an easy task.

China will need to invest in battery storage and pumped hydropower, and smarter and more flexible grid technology. It must reform electricity markets to enable more flexible use of existing supply. And it will have to promote emerging technologies like hydrogen and thermal energy storage to help plug gaps in electricity generation.

Demoting China's large coal-fired power station fleet to playing the supportive role of responsive back-up capacity, while clean energy provides the core of supply, is one attractive short-term solution.

However, China's energy planners should look to the long-term. If they focus on attaining the country's climate obligations – including achieving net zero emissions before 2060 – then China would only need to use coal-fired power as a last resort throughout its transition.

China's recurring power crises highlight its need to rebuild its power system around clean energy. It must find a balance between its current energy security and its goal of achieving a clean energy future as soon as possible.

To do this, the country needs a long-term plan that not only invests in clean power generation, but also steps up investment in storage, transmission, and grid flexibility. This will do more for its transition than any generation target and stabilise its energy security in the process.

As China embarks on its truly massive energy transition journey, its leaders must remember that keeping the ship steady is just as important as seeing how fast it can go.

*Dr Xing Zhang is a senior analyst at the Finland-headquartered Centre for Research on Energy and Clean Air.*

*Dr Muyi Yang is an Adjunct Fellow at the Australia-China Relations Institute, University of Technology Sydney.*

*Professor Xunpeng Shi is Research Principal at the Australia-China Relations Institute, University of Technology Sydney.*