

22<sup>nd</sup> August 2022

**The worst heat wave ever recorded in China is wreaking havoc the power sector**

Since early July, unprecedented heatwaves have been sweeping across southern parts of China, drying up reservoirs and crippling hydropower stations along the Yangtze River. Due to the abnormal drop in rainfall level, high-temperature alerts have been issued by China's National Meteorological Center for the 32<sup>nd</sup> consecutive day, with top daytime temperatures across 13 provinces ranging from 35 degrees Celsius to 40 degrees Celsius. Based on both intensity and duration, this is so far the worst and longest heatwave China ever experienced since 1961 when nationwide weather records started being gathered. On 18<sup>th</sup> August, a severe drought alert has also been issued for the first time in 9 years with the expectation that the situation will persist for at least the coming weeks.



Source: [South China Morning Post](#)

Along the Yangtze River, a jaw-dropping 50% decline in average rainfall combined with high temperatures is having a devastating impact on power generation, particularly for provinces like Sichuan that heavily rely on hydropower to keep their air-conditioners on.

In 2021, hydropower accounted for more than 80% of electricity generated in Sichuan, making it China's largest hydropower hub.

Due to a sharp cut in electricity generation from hydropower, Sichuan's total electricity generation in July was half of what it was same time last year, while the average residential consumption surged by 93.3% due to increased cooling demand.

The impact extends well beyond the provincial borders to other regions as Sichuan normally exports one-third of its electricity to more affluent eastern coastal provinces. Several other major Chinese provinces including Jiangsu, Anhui and Zhejiang have also urged businesses and households to save power as the heatwave has depleted electric supplies.

Facing tremendous pressure to generate enough electricity, the province announced to [suspend](#) electricity supply to all industrial users from 15<sup>th</sup> August to 20<sup>th</sup>, putting thousands of factories at a complete standstill. Unfortunately, due to the ongoing heatwave, the suspension has been [extended](#) for another week, until 25<sup>th</sup> August. Outside of industrial zones, outages have been gradually spreading to commercial and residential areas as well. Cities are turning off lights on the streets and subway stations. Office buildings and shopping malls are operating without proper lighting and air-conditioning. Even some residential buildings are being asked to cut off electricity for a few hours every day.

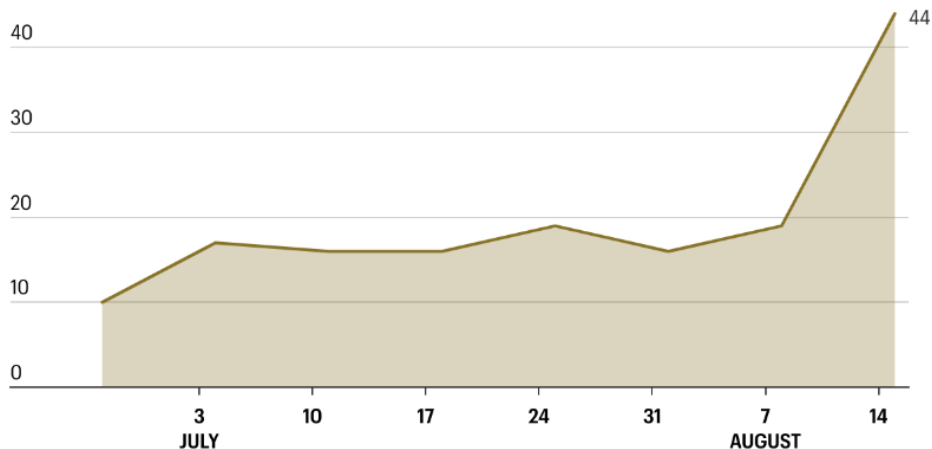
The blackout's impact on the Chinese supply chain is serious. Over the past week, more than 20 A-share listed companies have warned investors of the impact of production halts. Due to its abundance of hydro resources, Sichuan has become a key manufacturing hub for a number of sectors, especially for energy-intensive factories. For instance, the province produces 30% of China's lithium salt, and the shutdown may squeeze the already-short supply and push up the cost of the battery component if the halt lasts for a longer period.

Sichuan is also home to some of the world's biggest semiconductor and electronics companies, including Foxconn, the maker of Apple iPhones and iPads, Intel, and BOE. It is also a manufacturing hub for energy-intensive sectors such as steel, aluminium and chemicals thanks to its price-competitive hydropower.

The solar industry is expected to be impacted significantly too as major polysilicon and cell producers such as Tongwei, Jinko Solar and GCL-Poly are all heavily exposed to the province. Global auto giants Tesla and SAIC Motor are among those impacted due to a shortage of components manufactured in Sichuan. On 18<sup>th</sup> August, the Shanghai government delivered an official [letter](#) to the Sichuan government, stating that its carmakers have been experiencing a component shortage and asking the province to prioritize electricity usage for auto components production.

### **Factory shutdowns in China are rising—Fast**

Weekly factory shutdowns in China in 2022



Source: Fortune

The round of power shortages has certainly reminded us of the previous power crisis in China in Q3 2021 which was mainly caused by the government's aggressive efforts to reduce emissions leading to a shortage of coal supply. The current crisis also has similarities to the Indian power crisis in Q2 2022 (which we discussed in a previous [article](#)) that had been caused by a nationwide heatwave and a coal shortage.

Ever since the Q3 2021 crisis, China has been learning from its previous policy mistakes and adopted a more balanced approach toward coal-power plants, which accounted for 56% of the country's total power consumption in 2021. Recognising coal as an important

source of baseload energy, regulators have granted permits to open new [coal mines](#) to boost domestic output.

On installed power generation capacity, the government approved plans to add 8.63 gigawatts of new coal power plants in Q1 2022 alone, nearly half of the capacity that had been approved in 2021. Since early July when the heatwave first started and the demand for cooling surged, power generation companies have been deploying as many coal power units as they could to close the gap. Market-based measures such as "[demand response](#)" have also been implemented among industrial users, but unfortunately these measures were not enough to absorb the imbalance.

In addition to the lack of alternative baseload energy, a structural issue within China's transmission masterplan has certainly exacerbated the situation. To resolve the resource and energy imbalance between different parts of China, the plan was designed to transmit electricity from resources-abundance northwest, north and northeast provinces to more densely populated, power-hungry eastern coastal areas through ultra-high voltage (UHV) transmission lines.

Each year, provinces that require extra electricity sign annual power purchase agreements with provinces that are able to generate surplus hydro or renewable energy. The amount of power to be transmitted from one province to another is now strictly set. While well-intended, such a plan largely fails to take into consideration daily and seasonal fluctuations in output coming from renewable and hydro sources. Extreme weather conditions such as those experienced at present no doubt highlighted the system's vulnerability as exporting provinces remain obligated to fulfill their power transmission quotas while at the same time struggling to keep the lights on at home. Even without fluctuation caused by extreme weather events, a large supply shortfall is expected by 2025 in Sichuan Province as its provincial energy bureau warned in its five-year energy plan of a gap in the province's capacity to meet demand and increased difficulties in maintaining stable and reliable power supplies.

Since 2015, China's attempted market-driven reforms in the power sector have been a lengthy and painful process with mixed results. In 1H 2022, the volume of electricity traded through energy exchanges already accounted for 60.6% of the country's total electricity consumption, a nearly 50% increase from the same period last year. However, a number of obstacles are still in place to prevent a nationwide power trading system from launching

in the short-term such as each province's industrial and energy planning which typically conflicts with those of other provinces.

As an encouraging sign, on 23<sup>rd</sup> July more than 157 power plants in Yunnan, Guizhou and Guangdong provinces and their customers concluded the first cross-provincial spot transaction through the southern regional power market's pilot scheme. But supplying clean and stable electricity to 1.4 billion people with surging energy demands cannot rely solely on market-based reforms. It requires long-term strategic planning, inter-provincial coordination and technological advancements in areas such as energy storage, UHV, Carbon Capture, Usage and Storage (CCUS) and microgrids.

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