

JUDE WOODCOCK:

## Why transitioning from a coal-based energy infrastructure is necessary for China's rise

China is the largest emitter of carbon dioxide (CO<sub>2</sub>) in the world, accounting for 30.7 percent of global emissions in 2022, over twice that of the second-highest emitter, the USA (Tiseo, 2023). As of 2021, coal accounted for 62 percent of the fuel consumed to satiate China's massive energy demands (BP, 2022). Out of all the fossil fuels coal is the dirtiest, releasing far more fine particulates and carbon dioxide when burnt. In Beijing in January 2013, levels of pollution reached an all-time high for four days in what was coined an 'Airpocalypse'. Largely as a result of this, China launched its war against pollution in 2014 which has significantly reduced pollutants since. However, China is still the 13<sup>th</sup> most polluted country on earth (AQLI, n.d.). Importantly this event revealed to many ordinary Chinese citizens that coal use must be stopped. Not only is the level of use detrimental to human health but it is also devastating to the environment which could have serious consequences for China's economy down the line. China is uniquely equipped with an abundance of manufacturing infrastructure and green energy technology so it must use this to curb coal use and draw China into the new age of 'Ecological Civilisation' promised by Xi Jinping.



Left, An 'Airpocalypse', 2017 (NBC, 2017), right, the 'Great Smog of London', 1952 (Rosenberg, 2019) both caused by excessive coal use.

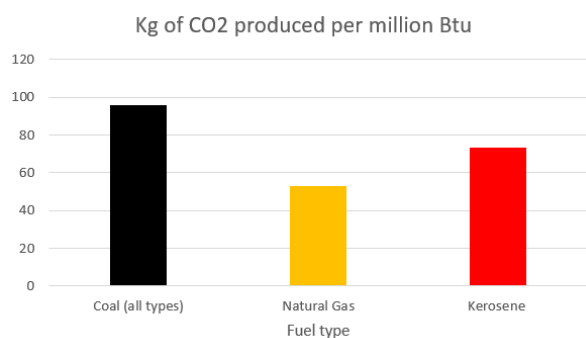
Following her personal experience with the 'Airpocalypse' and the failures of China's war against pollution in its aftermath, journalist Chai Jing released groundbreaking exposé *Under the Dome*. The documentary was viewed 150 million times before it was taken offline and censored within just four days. The documentary starts with a personal anecdote by Chai Jing concerning complications during her pregnancy where her daughter developed a tumour in utero which Chai blames on the air quality in Beijing at the time. The documentary proceeds to examine air pollution through the lens of its effects on public health, in particular focusing on Children to weave the story. It then delves into the causes underlying this extreme level of pollution, claiming that 60 percent of fine particulates (PM<sub>2.5</sub>) is from coal and gas combustion. Comparisons between the pollution in China and what the UK faced back in 1952 in what was known as the Great Smog of London are frequently drawn which hammers home the antiquatedness of coal use in the modern era. The heavy use of coal to power the government-run cement and steel industries is also examined. The documentary steers away from coal as the consequences of corruption and minimal regulation on emissions caused by cars and freighters which further contribute to the heavy pollution seen across China are investigated. Chai Jing finishes the documentary by bringing up solutions, again leaning on

the UK as an example through ending coal use and turning to using oil and gas which are far cleaner fossil fuels than coal.

*The documentary elicited a mixed reaction from me. There were some extremely powerful moments throughout such as when Chai Jing asked a six-year-old boy if he had ever seen a star to which he responded “No”. Moments such as these are upsetting, knowing that there are children out there who have never been filled with that sense of wonder when looking up on a clear night. When Chai talks about corruption it is hard not to feel angry that the government appears to care so little about its citizen’s health. This is why the end of the documentary is so frustrating because her solution is to move to natural oil and gas which are significant contributors to climate change and so are not a valid long-term solutions, even if they address some of the immediate concerns, the effect feels alike to putting a plaster on a severed limb.*

*The documentary is at many points highly relevant to my question, particularly concerning the importance of protecting public health through the eradication of the coal industry. The topic of climate change does feel like a piece of the puzzle the documentary seems to largely miss or possibly avoid which I believe is wholly relevant to such a research question. Furthermore, the implications of such a move on the economy is an important factor to address especially when considering this is often what would incentivise governments to act. Once again, her solution of using oil and gas as a replacement for coal due to how little climate change is mentioned seems like an oversight to say the least.*

To answer why China should transition from its current coal-based infrastructure it is important to look at the impacts of coal use on the environment, human health, and China’s



Amount of CO<sub>2</sub> produced in kilograms by fossil fuels per million British thermal units (Btu). Data from eia.gov, 2023.

economy. If emissions stay as they are, China will be largely responsible for irreversible damage to the environment not just locally but on a global scale. Climate scientists almost unanimously agree that to prevent climate catastrophe, global temperatures must not increase by more than 1.5°C as this could trigger a cascade of tipping points which would greatly exacerbate warming (Armstrong McKay, 2022). This is primarily why turning to natural gas and oil as was stated in the documentary is fundamentally not the right solution since both these sources still emit large quantities of CO<sub>2</sub> when combusted.

Climate change will and already is causing massive economic damage in China. China's north is very drought-prone and the south flood-prone which above all else deeply impacts the agricultural sector. As a result of climate change exacerbating these issues huge

### Sinking Shanghai

Without higher sea walls, the Shanghai metropolitan area will soon be vulnerable to flooding. According to climate projections, the red-shaded areas are projected to be below sea level at least once per decade by 2050.



Source: The wire China, 2022

infrastructure projects have had to be undertaken to redirect water, such as the South-North water diversion project. Major economic shipping hubs such as Shanghai are also projected to go underwater due to sea level rise requiring large investments into sea walls and wetland restoration to minimise the impacts. If coal and other fossil fuel use is not curbed this will only get worse. All in all, it appears that the expenses of investment into a greener future now will far outweigh the costs in the future but the longer this is left the worse it will be, and this is especially true for middle income countries like China which will see the greatest reductions in economic growth over 1.5°C (IPCC, 2019).

Not only this but at its current rate China is projected to run out of coal in 35 years (Worldometer, 2016), so if the infrastructure is not abandoned soon China would be forced to import causing a great economic burden. Cooperation with other nations is also an important factor for this to work, China's retreat recently from its reform and opening era could spell disaster if China suddenly chooses to no longer work with countries to achieve climate goals.

Regarding public health, during the Airpocalypse in 2013, the concentration of fine particulates (PM<sub>2.5</sub>), which are particularly harmful as they can be absorbed through the lung lining (Xing et al, 2016), had an average daily peak of 569 µg/m<sup>3</sup> (Ferreri et al, 2017). This was around 114 times greater than the guideline amount recommended by the World Health Organisation (WHO) and caused a 1.74 times increase in respiratory emergency visits (Ferreri et al, 2017). Although this was an outlier event, China's national average PM<sub>2.5</sub> is still 30.2 µg/m<sup>3</sup>, 6 times that recommended by the WHO and takes 2.5 years of the average Chinese citizen's life (AQLI, n.d.). For the health of its citizen's the government must quickly abandon coal use since it is a very dirty energy source, releasing more fine particulates and almost twice the CO<sub>2</sub> as natural gas.

The sheer number of views Under the Dome garnered shows that issues surrounding public health are of particular importance for many ordinary Chinese citizens, so by extension, this is of great concern for China's government. If its citizens don't see actionable steps being taken then support could certainly wane. Especially given that criticisms of the government were explicitly raised within the documentary.

Transitioning from a coal-based energy infrastructure will be pivotal for China's rise. I believe Under the Dome makes this evident partly through its content but also through the public reaction to the documentary. The documentary showed that the level of pollution is a major indicator of the successes or failures of China's government as well as corruption. Armed with this knowledge and considering Xi Jinping's promise to deliver on carbon neutrality by 2060 (The World Bank, 2022), public scrutiny of environmental policy could perhaps be elevated moving forward. The documentary also highlights a wider near-sightedness to understanding what is needed to prevent pollution. Natural gas and oil are not

a solution to this issue because they will cause great problems down the line for China regarding climate change and still pollute, just less visibly. The aforementioned promise by Xi Jinping shows China's government understands this but whether or not 2060 is an adequate goal to properly address and mitigate this is up for debate and other nations will need to be closely worked with to deliver. China has been taking large steps to develop its green energy sector, particularly wind and solar energy so is clearly on the right track. Together with its manufacturing power, this could see China reach great prosperity if this sector is cornered and the exportation of such technology is welcomed. Clearly, the sooner coal is abandoned the sooner China can lead the world into President Jinping's Ecological civilization.

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