Industrial landscape in Northern China. PC: @Dailuo (CC), Flickr.com.

Why China Cannot Decarbonise

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This essay argues that regardless of President Xi Jinping's stated intentions, China cannot meet its carbon-neutral pledge. First, there are insuperable technical barriers to decarbonising the 'hard-to-abate' industries that account for about half of China's carbon dioxide emissions. Second, there are insuperable political barriers posed by Xi's overriding concern to save the Chinese Communist Party from the fate of the Soviet Communist Party by winning the race to technical supremacy and overtaking the United States to become the world's top superpower. To this end, he has no choice but to maximise the growth of the very industries that are driving China's emissions off the charts.

My book *China's Engine of Environmental Collapse* (Smith 2020a) opens with a question: given that the Chinese Communist Party (CCP) runs one of the world's most ferocious police states, why can't its leaders compel their subordinate officials to suppress pollution, including carbon dioxide (CO_2) emissions, even from the state's own industries? Indeed, as recent studies have highlighted, greenhouse gas (GHG) emissions from individual state-owned enterprises (SOEs) in power, steel, cement, oil refining, and other industries exceed those of entire industrialised nations. Last year, China Baowu, the world's largest steelmaker, pumped out more emissions than Spain—the world's twenty-fourth-ranked emitter. China Petroleum & Chemical pumped out more than Canada—the world's eleventh-largest emitter (Bloomberg 2021; Clark 2022; World Population Review 2022). In his widely acclaimed speech to the United Nations General Assembly on 23 September 2020, Chinese President Xi Jinping

pledged to 'transition to a green and low-carbon mode of development' and to 'peak the country's CO_2 emissions before 2030 and achieve carbon neutrality before 2060' (Xi 2020; Smith 2020c). Since the companies mentioned are directly controlled by Beijing, one would think Xi should be able to force them to clean up. After all, it is often argued—as by Yifei Li and Judith Shapiro, for example—that China's dictatorship should be an advantage in this context: 'Given the limited time that remains to mitigate climate change and protect millions of species from extinction, we need to consider whether a green authoritarianism can show us the way' (Li and Shapiro 2020, quoted from the publisher's book description).

Since CCP bosses do not have to contend with public hearings, environmental studies, recalcitrant legislatures, labour unions, a critical press, and so on, Xi should be able to force state-owned polluters to stop polluting *or else*, and ram through his promised transition to renewable energy (see Smith 2017, 2020c). So why is he not doing that?

In its most dire assessment yet, in April, the Intergovernmental Panel on Climate Change (IPCC 2022) declared that 'it's now or never'. Only 'rapid, deep and immediate' cuts in carbon dioxide emissions can prevent runaway global warming and the collapse of civilisation. To keep global warming below 1.5°C, coal use must decline by 95 per cent by 2050, oil by 60 per cent, and gas by 45 per cent. The decreases required to limit warming to 2°C are not much different. Under all scenarios, no more fossil-fuel power plants can be built and most existing ones must be decommissioned. The IPCC's message is clear: 'Any further delay in concerted anticipatory global action will miss a brief window of opportunity to secure a liveable planet and sustainable future for all' (2022).

Most of the world's leading capitalist industrial democracies have reduced their GHG emissions to an extent. In the United States, carbon dioxide emissions in 2020 were down 14 per cent from their peak in 2005; emissions in the 27 member states of the European Union were down 32 per cent from their peak in 1981; and Japan's have dropped 14 per cent from their peak in 2013 (CAT n.d.). To be sure, those reductions are still insufficient to meet their respective Paris commitments (and their Paris commitments are themselves insufficient to prevent global temperatures rising above 1.5°C), but at least they are declining.

By contrast, under Xi Jinping, as much as under his predecessors, China's carbon dioxide emissions have relentlessly grown, more than quadrupling from 1990 to 2020. Climate Action Tracker estimates that in 2021 China's emissions increased by 3.4 per cent to 14.1 gigatonnes of carbon dioxide equivalent (GtCO2e)—nearly triple those of the United States (4.9 GtCO2e) with a gross domestic product just three-fourths as large (CAT n.d.; EIA 2022). Since 2019, China's emissions have exceeded those of all developed countries combined and presently account for 33 per cent of total global emissions (Larsen et al. 2021; IEA 2021). Paradoxically, China leads the world in the production of installed capacity of both wind and solar electricity generation. Yet, 85.2 per cent of China's primary energy consumption in 2020 was still provided by fossil fuels—down just 7 per cent from 92.3 per cent in 2009 (BP 2021). And despite huge investments in giant solar and wind farms across multiple provinces and autonomous regions, fossil fuels (mostly coal) still accounted for 67.4 per cent of electricity generation in 2021, while wind contributed just 7.8 per cent and solar barely 3.9 per cent (China Energy Portal 2022; Myllyvirta 2022b). In the first half of 2021, rebounding from the first wave of Covid-19, China's carbon dioxide emissions surged past pre-pandemic levels to reach an all-time high 20 per cent increase in the second quarter before dropping back in late 2021 and the first half of 2022 as the real estate collapse, Omicron lockdowns, and drought-induced hydropower reductions slashed economic growth to near zero in the summer (Hancock 2021; Myllyvirta 2022a; Riordan and Hook 2022).

Doubling Down on Coal and Dooming the Transition to Renewables

Since 2016, the Chinese Government has repeatedly promised to phase out coal and coal-fired power production only to renege on those commit-

ments (Smith 2020a: xv–xvi). While coal-fired power plants are being decommissioned around the world, China has approved a raft of new coal mines and coal-fired power plants. In March 2022, the National Development and Reform Commission committed to boosting domestic annual coal production by 300 million tonnes. In April, the government approved a new mega-coalmine in Ordos that will produce 15 million tonnes each year and could do so for nearly a century (Global Times 2022a). China produces and consumes half the world's coal and the nation's coal production hit record levels in 2021. The new Fourteenth Five-Year Plan stresses the critical role of coal in 'ensuring basic energy needs' and supporting the nation's power system (Yeh 2022). China promised to stop building coal-fired power plants abroad, but it is building more than 200 new coal-fired plants at home in a drive to boost economic growth, maintain jobs in coal-dependent regions, and ensure energy self-sufficiency—locking the country into coal reliance for many decades to come, derailing the transition to renewables, and dooming Xi's UN pledge to transition to a green and low-carbon mode of development (Xie 2020). In 2020, the Chinese Government approved 47 gigawatts of new coal power projects—more than three times the new capacity approved in 2019. In 2021, it approved another 73.5 gigawatts of coal power—more than five times the 13.9 gigawatts proposed in the rest of the world in that year (Standaert 2021). And with the unprecedented summer drought this year that dried up rivers across southern China and cut hydropower generation by 40 per cent, the government is doubling down on coal and officials are concerned about the reliability of renewables, even voicing scepticism about the very idea of phasing out coal (Global Times 2022b; Riordan and Li 2022).

And not only coal. China's government has been pouring investments into oil and gas production, refineries, and building pipelines from Kazakhstan and Russia to import natural gas. The Siberian pipeline alone will enable China to import 1.3 trillion cubic feet of natural gas a year (two-thirds as much as Russia supplies to Germany) through to 2049 (Darwell 2020). China is now the world's largest importer of natural gas and oil. Pipelines are huge investments and require years to construct. It strains credulity to believe that the same government that is investing hundreds of billions of dollars in new coalmines, oil wells, refineries, and gas pipelines really intends to start shutting them just seven years from now.

In sum, far from 'transitioning to a green and low carbon mode of development', ultra-authoritarian Xi Jinping is developing the most carbon-intensive large industrial economy in the world. The Party-State has abandoned the transition to renewables in favour of an 'all of the above' approach to energy generation: more solar and wind, but even more fossil fuels. The question is why? I contend that there are two main reasons for this.

China's Engine of Environmental Collapse, Richard Smith (2020).

Technical Barriers to Decarbonising the 'Hard-to-Abate' Industries

The first reason is technical. I claim that there are insuperable technical barriers to decarbonising China's economy, especially in any time frame that matters for human survival. Let us start with what are collectively termed the 'hard-to-abate' industries that account for about half China's GHG emissions. Xi's first problem is that China is home to the world's largest concentration of carbon-intensive, hard-to-abate industries like steel and cement. Thermal electricity generation (90 per cent from coal, 10 per cent from gas) accounts for 32 per cent of China's total carbon dioxide emissions. For this reason, replacing coal-fired power plants with solar and wind-powered generators could cut China's emissions by about one-third—a huge gain if this transition can be implemented (Smith 2020c: 49–51). But electricity generation is the low-hanging fruit of carbon mitigation—one of the very few sectors in which economic growth can be decoupled from emissions growth.

At least 47 per cent of China's GHG emissions come from hard-to-abate manufacturing and other industries, most of which cannot be significantly decarbonised with current or anticipated technology either at all or in time to avert runaway global warming and climate collapse. Steel, aluminium, cement, aviation, shipping, heavy road transport, chemicals, plastics, synthetic textiles, and electronics stand out. As I have explained elsewhere (Smith 2020c), decarbonising those industries has defied all efforts to date both in China and in the West, and while scientists and engineers are working on many new technologies—green hydrogen steel, electric and hydrogen airplanes, carbon capture and storage, etcetera—commercialising these, where possible at all, will require many decades.

For example, Bloomberg's New Energy Frontier analysts estimate that with a crash program, the global steel industry could replace coal with hydrogen for 10–50 per cent of output before 2050 (Smith 2020c: 34–35). McKinsey estimated that with massive funding, hydrogen could meet 14 per cent of total US energy needs by 2050 (Penn and Krauss 2020). At those rates, why bother? Worse, 96 per cent of the world's commercially available hydrogen is derived from fossil fuels. Producing 'green' hydrogen would require the rapid construction of a huge and stupendously expensive new 'electroliser' industry based on technologies that are still in their infancy and unproven at scale. Even if such an industry could be built in the next decades, the daunting hazards of transporting, storing, and safely fuelling steel mills and vehicles, let alone airliners, with hydrogen have no ready solution either. Cement, aluminium, aviation, chemicals, plastics, and all the other hard-to-abate industries face similar constraints. Furthermore, the technical barriers to carbon mitigation apply as much to the capitalist West as to communist China. As *The Guardian*'s environmental columnist George Monbiot wrote in 2007 with respect to the aviation industry:

> There is no technofix. The growth of aviation and the need to address climate change cannot be reconciled … [A] 90 percent cut in emissions requires not only that growth stops, but that most of the planes which are flying today are grounded. I recognize that this will not be a popular message. But it is hard to see how a different conclusion can be extracted from the available evidence. (Monbiot 2007: 174)

Fifteen years on, the global aviation industry still has no viable alternative to kerosene jet fuel for airliners—but the climate emergency we face today is far more desperate, hence the need to park those planes (and the cars, trucks, cruise ships, container ships, etcetera) is far more urgent. Climate activist Greta Thunberg (2019) is right: 'Our house is on fire. We need to act like it.'

All talk of carbon taxes, cap and trade, and carbon capture and sequestration is delusory (Smith 2016a, 2019). The only way China can effect 'rapid, deep and immediate' cuts in carbon dioxide emissions is to 'grab the emergency brake': immediately begin retrenching and/or shutting the country's thousands of needless, wasteful, harmful, and polluting industries, such as the shockingly wasteful

production of disposable products, from flimsy unrepairable plastic household goods and appliances to disposable shoes, 'fast fashion', bottled water, chipboard IKEA furniture, and high-end but disposable new versions of iPhones; halt the 'blind production' of steel, aluminium, glass, cars, 'Made in China' airliners, self-driving cars, cruise ships, 'smart' appliances, copy-cat theme parks, glass bridges, and recreational drones; end the 'blind construction' of Ponzi-scheme condominium blocks, 'ghost cities', useless 'international' airports in provincial towns, empty high-speed trains on little-used routes, the tallest skyscrapers, longest bridges, longest tunnels, and similar 'blingfrastructure' projects built not for the needs of China's people but for the glory of CCP officials; and shut all but critically essential coal-fired power plants and halt the stupendous waste of power used to produce all this needless junk and over-illuminate China's cities (Bloomberg 2017; van Wyk 2020; Smith 2020a: Ch. 7).

I am not singling out China. I have made the same arguments with respect to the capitalist West (Smith 2016a). Nor am I saying we must go back to log cabins and horses and buggies. What I am saying is that the pursuit of infinite economic growth on a finite planet is going to kill us all, and soon. With more than 7 billion people crowded on one small blue planet, we need to slam the brakes on out-of-control growth. We need to 'contract and converge' production around a globally sustainable and acceptable average that can provide a dignified living for all the world's peoples while leaving ample resources for future generations of humans as well as for the other fauna and flora with which we share this planet and on whom we critically depend. If we do not do this, we are doomed (I have tried to show how such a wholesale reorganising of our economies could give us not only an environmentally sustainable economy but also a better mode of life in Smith 2016b).

But suppressing production is the one option President Xi cannot accept because those hard-to-abate industries have been indispensable to China's rise and underpin his aspirations to 'make China great again', win the technology race, and overtake the United States.

Political Drivers of and Barriers to Decarbonisation

Thus, the second reason is political. What drives growth in China? China is the most complex economy in the world, with numerous built-in drivers of and barriers to emissions mitigation. It has every kind of capitalism: state capitalism, joint-venture capitalism, gangster capitalism, regular chamber of commerce capitalism—the lot. Roughly speaking, the industrial economy formally comprises the state-owned state-planned sector (50 per cent of industrial output), the foreign-invested joint-venture sector (30 per cent), and the private sector (20 per cent) (Smith 2020b). The private and joint-venture sectors are of course driven by profit maximisation. The government also owns some foreign companies (such as Syngenta and Volvo) which it runs as state-capitalist companies. The state-owned economy has been modernised and partially marketised, but structurally remains little changed from Mao Zedong's day. This sector operates on different maximands. State-sector growth is driven by the CCP ruling class, by their subjectively felt needs, fears, and ambitions, and projected by central planners into five-year plans geared to achieve their goals. I contend that China's state-led economic development is propelled by five unique drivers of hypergrowth.

First, at the highest level, hypergrowth is driven by CCP *ambition* and *fear*. Since Mao took over the CCP in the 1930s, the Party-State has been led by a self-appointed elite of ultranationalists. Mao was first and foremost an ethno-nationalist in the tradition of China's nineteenth-century and early twentieth-century 'self-strengtheners'. They were concerned not merely with modernising and industrialising their country to catch up with the West. From Sun Yat-sen to Mao, Deng Xiaoping, and Xi, China's leaders have all been obsessed with one overarching goal: to overcome China's 'century of humiliation', achieve 'wealth and power', and 'overtake the West' to reclaim what they imagine is China's *deserved pride of place* as the premier civilisation and culture in world history. In their view, China should be the 'natural leader of human-

kind', the rightful successor to 'the declining West', because China is a morally and politically superior 'new-type superpower' (Smith 2022; Sun 1922; Liu 2015; Hu 2011). Since 1949, China's leaders have also been motivated by a deep fear of capitalist restoration or even a takeover of their economy by Western corporations. As a state-based communist party ruling class in a world dominated by more advanced and powerful capitalist nations, Mao and his successors understood, like Stalin and his successors, that they must overtake the United States to become the world's leading superpower. The Russians' failure to win the economic and arms race with the United States doomed the Soviet Communist Party, and Mao's successors—notably, Deng and Xi—have been determined to avoid that error. Thus, the leading driver of hypergrowth is the party's determination to build a relatively self-sufficient industrial superpower by protecting state industries (regardless of their pollution), ramping up import substitution, and achieving technological superiority over the West.

Second, China's rulers need to maximise employment to maintain 'stability' even if this often means producing superfluous coal and steel, needless infrastructure, ghost cities, and so on. Maximising employment is a major driver of overproduction, overconstruction, 'blind growth', 'blind demolition', 'blind investment', and profligate waste of energy and resources across the economy.

Third, they also need to maximise consumerism. In the wake of the collapse of the Soviet Communist Party in 1991 and the Chinese communists' own near-death experience with the Tiananmen Square protests in 1989, the CCP leadership resolved to create a mass consumer economy and raise incomes to divert people's attention from politics to consumption. Since the early 1990s, the government has promoted one consumer craze after another: cars, condominiums, shopping malls, tourism, golf courses, theme parks, cruise boats, food delivery, video games, online shopping, and more. After centuries of poverty and decades of Maoist austerity, the Chinese were overdue for improved living standards (Bloomberg 2017). Yet, the promotion of mindless consumerism for the sake of consumerism on the model of Western capitalism has contributed mightily to China's and the world's waste and pollution crises (Li 2015; Chen 2017).

Fourth, intra-bureaucratic competition drives more growth. In 1992, Deng cut a profit-sharing deal with local and provincial officials (the nominal owners of most SOEs) giving them the right to sell over-plan and sideline production on the free market, and split the profit with the state (Wu 2005: 146–51). He then exhorted them to 'grow the gross domestic product' (GDP). This certainly jumpstarted growth, providing a wider array of goods and services. But the introduction of market incentives within the framework of the old bureaucratic system of collective property and surplus extraction also exacerbated many of the irrationalities of that system while adding new irrationalities of capitalism (Smith 2020a: Ch. 5). In this compartmentalised particularistic system, opportunities for officials to boost the income of their counties, municipalities, or provinces (and enrich themselves by legal and illegal means) were largely confined to the perimeters of their own bailiwicks. Thus, they found themselves in a zero-sum competition with officials in other municipalities or provinces over markets, central appropriations, and promotion such that, as one official put it, 'every locality sees itself as if it's a separate country' (Smith 2020a: 102). As a result, Deng's exhortation led in short order to GDP 'tournaments' as local officials competed to boost their growth rates to polish their credentials. For example, while the Eleventh Five-Year Plan set the national target for GDP growth at 7.5 per cent, all 31 of China's provinces set higher targets. The average was 10.1 per cent. Competition-driven local GDP growth in turn has driven national GDP to overshoot planned targets. Since 1978, central planners never set growth targets higher than 8 per cent per annum, but that target has been routinely exceeded. In the period 1983–88, GDP growth averaged 11.9 per cent, hitting 15.2 per cent in 1985. From 1992 to 2011, GDP growth averaged 10.5 per cent, topping 11 per cent and 14 per cent on the crest of the boom in 2006 and 2007, respectively (Smith 2020a: 98–99). The government has been trying to suppress 'zombie' overproduction

Traffic jam in Beijing, China. PC: @ianholton (CC), Flickr.com

of coal, steel, aluminium, glass, housing, cars, and other commodities for decades—largely without success (Smith 2020a: 100).

Fifth, corruption is a major driver of hypergrowth. Thanks to market reform, the Chinese Government became the richest state in the world, with rivers of cash flowing in from SOE profits, taxes, trade surpluses, and so on. Its US$3 trillion foreign exchange hoard is the world's largest. All this treasure is the property of the Party-State, but individual CCP officials have no legal right to any of it. They are legally entitled only to their trivial salaries and perks. Yet, as we know, China's rulers are filthy rich (Garside and Pegg 2016). The only ways officials can take 'their share' of these social surpluses are illegal. Thus, from princelings down to local mayors and party secretaries, officials have used and monetised their power to loot the state. Hundreds of high officials have been prosecuted for bribery, embezzlement, sale of offices, and related crimes. Corruption also fuelled growth. From ghost cities to high-speed gravy trains, an unknowable but no doubt huge proportion of China's overproduction and overconstruction would not have been produced were it not for the new opportunities they afforded cadres to steal even more (Smith 2020a: Ch. 6).

In sum, planned growth targets of 6–8 per cent per annum plus intra-bureaucratic competition to maximise GDP plus government efforts to maximise employment and consumerism plus corruption are, in aggregate, even more powerful drivers of hypergrowth than profit maximisation under capitalism. Those drivers have powered China's growth at three to four times the rate of growth of Western capitalist economies for the past three decades and generated soaring carbon dioxide emissions in the process.

Rejuvenation Submerged

This summer, China endured what scientists have called 'the most severe heatwave in world history' (Le Page 2022). Startling in its scale, duration, and intensity, record-shattering temperatures baked the southern half of China, drying up hundreds of rivers, withering crops, igniting wildfires, forcing factories to close, and pushing people to seek refuge in caves or at higher altitudes (Bossons 2022; Ali 2022). Yet, awful as this was, it will seem mild compared with what is coming. Global average temperatures have not yet breached 1.5°C above preindustrial levels but are projected to exceed 3°C before the end of the century. In October 2019, climate scientists published research showing that on present trends, global warming is going to 'all but erase' Shanghai, Shenzhen, and 'most of the world's great coastal cities by 2050' (Lu and Flavelle 2019). There will not be any 'great rejuvenation' and glory for the CCP when its cities are under water, when the glaciers melt, and farming collapses across the country. There will be ecological apocalypse, famine, and untold human suffering. ■

This text is taken from *Made in China Journal: Volume 7, Issue 2, 2022*, edited by Ivan Franceschini, Nicholas Loubere and Andrea Enrico Pia, published 2022 by ANU Press, The Australian National University, Canberra, Australia.

doi.org/10.22459/MIC.07.02.2022.08