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China's post-COVID-19 stimulus: No Green New Deal in sight

Jorrit Gosens*, Frank Jotzo

Crawford School of Public Policy, Australian National University, 132 Lennox Crossing, Acton ACT 2601, Australia



ABSTRACT

Much hope has been placed on China's decisions regarding low-carbon stimulus following COVID-19. Analysis of China's recent Government Work Report suggests that while a repeat of recovery measures focused on high-emissions infrastructure following the 2008 global recession is not in the cards, a Chinese Green New Deal is not in sight either. Much investment is flowing to fossil fuel industries, whilst support policies for renewable energy industries are absent from Beijing's recovery program. These signs of environmental ambition taking a back seat are worrisome given that Beijing is currently designing its 14th Five-Year Plan.

Economic recovery programmes, designed in response to the downturn caused by COVID-19, offer the prospect of accelerating sustainability transitions (Rosenbloom and Markard, 2020; Steffen et al., 2020). They could do so in two related ways. First, stimulus measures could avoid investment in fossil-fuel and other high-emission sectors. Such investment may be wasteful as these sectors are destined for decline, and may therefore generate only limited and temporary economic benefits, at potentially high environmental costs. Second, 'green' stimulus, or investment in clean energy and low-emissions infrastructure, may accelerate ongoing stabilization and growth of niches for low-carbon alternatives (Markard and Rosenbloom, 2020).

This thinking has already found its way into policy making considerations around the world. The European Council has called for recovery through "green transition and the digital transformation" (European Council, 2020), and the EU 'Green Deal' recovery package is expected to allocate hundreds of billions of euros to investment in renewables, clean hydrogen, and sustainable mobility (European Commission, 2020). Germany plans to spend over a third of its 130 billion euros stimulus package on "future technologies", such as renewable energy, hydrogen, electric cars and Artificial Intelligence (Federal Ministry of Finance, 2020). In the US, a "Green New Deal" stimulus package that includes net-zero emission targets, coupled with investment and job-creation in sustainable energy infrastructure and industries, has been proposed but remains a contentious issue for now (Galvin and Healy, 2020).

China offers perhaps one of the most tantalizing prospects for low-carbon outcomes following COVID-19. It has dramatically reduced the rate of growth of its carbon emissions in recent years (Fig. 1), and is one of the largest global producers of low-carbon equipment, including PV panels, wind turbines, and increasingly also electric vehicles (Korsnes, 2019; Meckling and Nahm, 2019). The government has set high ambitions for technological leadership in clean-tech industries, has incorporated sustainable development under the label of 'ecological civilisation' as a guiding principle in its constitution, and has a tradition of strong government intervention (Binz et al., 2017; Chen and Lees, 2016; Hansen et al., 2018). Hopes for a massive post-pandemic push for green investment do therefore not seem far-fetched.

Following the Global Financial Crisis (GFC) of 2008, China spent RMB 4 trillion on stimulus measures, very largely focused on construction projects (Li et al., 2014; World Bank, 2010). As a result, China's carbon dioxide emissions increased by 25 % over 2008–2013, whilst emission growth rates fell considerably once effects of the stimulus programme wore out (Fig. 1). From a climate change perspective, Chinese policymakers should avoid repeating such a build-up of hard infrastructure that uses enormous volumes of concrete and steel. An exception would be for high-speed rail construction, as that can displace air travel and could be powered by zero-carbon electricity. More generally, large-scale green stimulus for low-carbon energy, electric mobility, cleaner industry, ICT, and

* Corresponding author.

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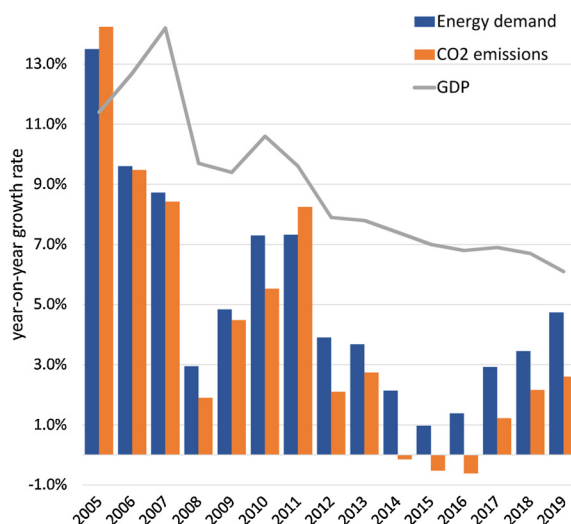


Fig. 1. Annual growth in China's GDP, energy use and CO₂ emissions. Sources: (BP, 2020; NBS, 2020a).

the service sector could accelerate economic growth, decoupled from emissions.

The Politburo Standing Committee, China's most powerful political body, recently signalled that 'New Infrastructure Construction' would be the way to promote growth. The concept covers digital transformation, such as 5G networks, data centres, Artificial Intelligence, and the Industrial Internet of Things, as well as low-carbon energy use, such as high-speed rail and light rail transit, UHV transmission lines that primarily transport renewable energy to China's coastal provinces, and charging infrastructure for electric vehicles (CCID, 2020; Worland, 2020).

But China's recent 'Government Work Report', roughly the equivalent of the US State of the Union, provides no indication of a large-scale economic stimulus for low-emissions infrastructure. The stimulus funding announced in the Work Report includes RMB 1 trillion (ca. €125 billion), made available by raising the central government's budget deficit from 2.8 % to roughly 3.6 % of GDP. Another 1 trillion is made available through issuance of specific pandemic bonds (Table 1). These two trillion RMB will be transferred to local governments, to be used to support households and small businesses with employment protection and tax relief measures, rather than investment for construction of infrastructure projects, and may thus have little effect on emissions (National People's Congress, 2020).

The Government Work Report also announced a RMB 1.6 trillion increase to the quota for special bonds issued by local governments. These bonds are used predominantly to investment in infrastructure projects like roads and railways, water conservancy projects, or industrial parks (Xinhua News Agency, 2020). The central government budget for such construction projects is unchanged from last year, apart from a RMB 100 billion increase to the central government's contribution to railway construction (Table 1). Separate stimulus measures have encouraged a RMB 1.3 trillion increase in bank lending in the first three months of 2020 (Hua and Yao, 2020). Roughly half of such loans were used to support infrastructure projects in the GFC stimulus package (World Bank, 2010).

Total officially announced stimulus, at about RMB 5 trillion, is modest in size compared to the package of 2009. That package would be worth RMB 5.3 trillion in today's money, but was spent on an economy half the current size (Fig. 2). The current package is also less strongly oriented on construction projects that boost use of cement and steel and thus spur emissions. The provincial bonds, railway funds, and an assumed half of the bank loans, add up to about RMB 2.25 trillion, whilst about RMB 4.4 trillion (in today's value), or about 85 % of the 2009 package was for construction projects (Fig. 2).

Despite the earlier buzz around 'New Infrastructure', Beijing has so far not committed to directing the stimulus funds to specific project types, as it did in the post-2008 stimulus package. Provincial governments will expect a greater say on expenditure as the infrastructure spending comes almost entirely out of their budget; the post-2008 package was sponsored half and half from central and provincial budgets (Li et al., 2014; World Bank, 2010). The Government Work Report refers to New Infrastructure projects, but

Table 1
China's COVID-19 stimulus measures.

Item	2019	2020	Additional spending on stimulus
Central government budget deficit	2.8 %	3.6 %	1 trillion
Pandemic bonds	–	1 trillion	1 trillion
Construction project investment fund	600 billion	600 billion	None
Railway construction fund	800 billion	900 billion	100 billion
Quota for 'special bonds' issued by local governments	2.15 trillion	3.75 trillion	1.6 trillion
Bank lending, status for the first three months	5.8 trillion	7.1 trillion	1.3 trillion

Sources: (Hua and Yao, 2020; National People's Congress, 2020, 2019). All values in RMB.

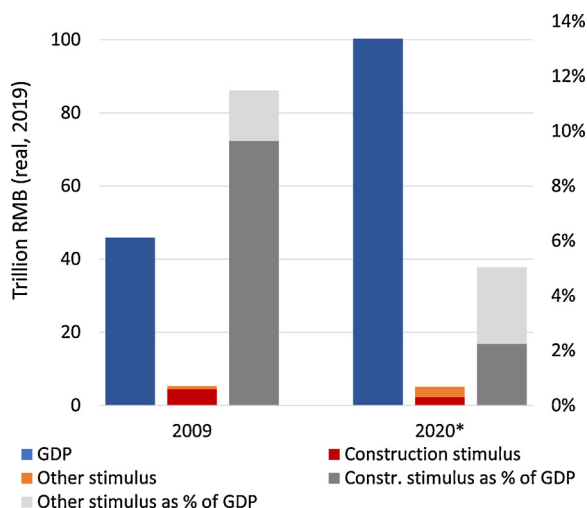


Fig. 2. China's 2009 and 2020 GDP and stimulus packages. GDP and stimulus values as trillion RMB (real 2019 value) on left-hand side axis. 2020 GDP as projected by IMF (2020). Stimulus as percentage of GDP on right-hand side axis.

mentions traditional transport infrastructure and urban re-development in the same breath. The only specific earmarking of funds is the increase to the railway construction fund. With such minimal guidance from Beijing, provincial governments may simply resort to trusted levers of traditional construction projects. Recent reports of a US\$ 1.4 trillion (or 10 trillion RMB) push for ‘New infrastructure’ are highly exaggerated: this refers to an exploratory analysis by a thinktank of the Ministry of Industry and Information Technology, which identified potential areas of investment; no government funding has been committed to this roadmap (Bloomberg News, 2020; CCID, 2020).

Beijing could have chosen to follow the EU’s and Germany’s example, and direct its COVID-stimulus towards sustainable mobility, hydrogen industries, and renewables. These are all sectors that China also seeks to compete in. A small incentive was indeed established for electric and other clean energy vehicles, which have had purchase tax exemptions extended by two years as a response to the COVID crisis, although only as part of a measure that sought to prop up vehicle demand more generically (NDRC, 2020a). Until recently, Beijing has promoted hydrogen utilization with a limited number of local pilot projects for fuel cell vehicles and refuelling infrastructure. Rather than seizing the momentum to launch a national hydrogen strategy including use in industry and transport, and with accompanying support policies as the EU and Germany have, such a strategy remains in draft stages for now (Energy Iceberg, 2020a).

China’s solar PV sector has seen rapidly falling rates of installation in recent years, due to continuous reductions in subsidy levels (Fig. 3). The COVID crisis has exacerbated financial difficulties for PV developers, but Beijing still followed through with its annual reductions of PV feed-in tariffs. It even slashed its subsidies for household-scale PV, which could benefit small private installers, by more than half (NDRC, 2020b). Many provincial governments are currently also halting any further wind power construction, as onshore wind projects connected to the grid after the end of this year will not receive subsidies from central government funds, even if they had previously been approved to receive these (Energy Iceberg, 2020b; NDRC, 2019). Beijing has been reducing these subsidies because its renewable energy fund is heavily overdrawn, by some RMB 200 billion by the end of 2019. A new rule stipulates that existing projects, eligible to receive subsidies from this fund, will have the pay-outs they were originally promised cut, by the same percentage as the fund’s overall shortfall (MOF, 2020).

Investment in long-lived high-carbon energy infrastructure, on the other hand, continues on a massive scale. Local authorities approved 48 GW of coal-fired power plants in just the first five months of 2020 already (Nengyuan Energy Magazine, 2020), after



Fig. 3. Chinese newly installed capacity of wind and PV (MW) in the first quarter of each year. Source: (NEA, 2020).

Beijing relaxed restrictions on investment in coal-fired power projects during February this year, perhaps in an early bid to counter the expected economic slowdown due to the COVID-crisis (National Energy Administration, 2020). In comparison, only 10 GW were approved over all of last year (Chen and Yang, 2020). Total coal-fired capacity under construction now stands at 98 GW, comparable to all operational coal-fired capacity in Germany and Japan combined (Global Energy Monitor, 2020).

Remarkably, for the first time ever, China's 2020 Government Work Report did not set a GDP growth target, officially because global economic and trade developments are too uncertain to allow accurate planning of domestic growth (National People's Congress, 2020). Dropping the 2020 target simultaneously implies dropping the politically weightier growth target for the entire 13th Five-Year Plan period, which ends this year. This, and the limited push for a construction-led recovery, appear to signal that Beijing does not seek economic growth at any cost – whether financial or environmental.

The Government Work Report would usually also set a national target for energy consumption, but this too was omitted this year. Between 2015 and 2020, energy intensity – the ratio of energy used per unit of economic output – was to come down by 15 %. From 2015–2019 it had fallen by 13.2 % (NBS, 2020b). The 2020 target may be hard to achieve considering the likely contraction of the intrinsically low-energy-intensity services sector. The Report usually also sets numeric targets for sulphur and nitrous oxides, but now simply aims for an unspecified reduction of these emissions. China's 2020 carbon emission target is to reduce its emissions intensity by 40–45 % compared to 2005. That target will be achieved, as reductions were already about 51 % in 2019, whilst China's absolute emissions may fall during 2020 (BP, 2020; Le Quéré et al., 2020; NBS, 2020a).

The Paris Agreement, and the climate change issue generally, reach well beyond the time-span of the current crisis, however. China's environment ministry recently stated that it would meet its existing Paris targets for 2030, despite the corona crisis, but it did not elaborate on possible ratcheting up of climate ambitions, as would be expected as part of the process, and as the environmental minister had stated they would just last year (Reuters, 2020). Beijing has not slammed its foot on the construction stimulus accelerator, but its reluctance to commit to ambitious long-term climate targets, its letting go of short-term energy consumption and pollutant emission targets, and a balance of investment that is clearly in favour of fossil rather than clean energy sources, all signal that environmental targets are currently taking a back seat to economic growth targets.

The worst may have been prevented, as Beijing has not opted for a massive construction stimulus program as it did eleven years ago, but a Chinese Green New Deal at this point is clearly not on the table either. This matters, because the country consumes half the world's coal, and emits 28 per cent of global carbon emissions. Chinese developments therefore strongly influence global energy transitions.

China is currently designing its 14th Five-Year Plan, which will guide economic and energy sector development through 2025. This plan needs to lock in sustainable, lower emissions development pathways to help give China and the world a better chance to achieve climate change goals. What Beijing sets out to do over its next 5-year planning period is likely to have far greater ramifications for global emissions than the immediate response to the COVID-crisis. That this plan is being designed at a moment when policy makers appear to have de-prioritized environmental targets is worrisome.

Declaration of Competing Interest

The authors report no declarations of interest.

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References

- Binz, C., Gosens, J., Hansen, T., Hansen, U.E., 2017. Toward technology-sensitive catching-up policies: insights from renewable energy in China. *World Dev.* 96. <https://doi.org/10.1016/j.worlddev.2017.03.027>.
- Bloomberg News, 2020. China's Got a New Plan to Overtake the U.S. in Tech [WWW Document]. URL <https://www.bloomberg.com/news/articles/2020-05-20/china-has-a-new-1-4-trillion-plan-to-overtake-the-u-s-in-tech> (accessed 5.21.20).
- BP, 2020. Statistical Review of World Energy 2019 [WWW Document]. URL <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html> (accessed 6.2.20).
- CCID, 2020. White Paper on the Development of “New Infrastructure Construction” [Partial English Translation] [WWW Document]. URL <https://chinaenergy-portal.org/en/white-paper-on-the-development-of-new-infrastructure-construction/> (accessed 6.2.20).
- Chen, G.C., Lees, C., 2016. Growing China's renewables sector: a developmental state approach. *New Polit. Econ.* 1–13.
- Chen, X., Yang, G., 2020. China Fires Up Coal Power Plant Construction [WWW Document]. *Caixin Glob.* URL <https://www.caixinglobal.com/2020-04-24/china-fires-up-coal-power-plant-construction-101546820.html> (accessed 6.5.20).
- Energy Iceberg, 2020a. China's New Fuel Cell and FCV Subsidy Policy Design [WWW Document]. URL <https://energyiceberg.com/china-fcv-subsidy-design-2020/> (accessed 5.29.20).
- Energy Iceberg, 2020b. China Suspending Renewable Development? A Good News to Battery Storage? [WWW Document]. URL <https://energyiceberg.com/renewable-suspension-battery-storage/> (accessed 5.29.20).
- European Commission, 2020. Recovery Plan for Europe [WWW Document]. URL <https://www.euractiv.com/wp-content/uploads/sites/2/2020/05/Green-Deal-Recovery-Package.pdf> (accessed 6.15.20).
- European Council, 2020. Joint Statement of the Members of the European Council, 26 March 2020 [WWW Document]. URL <https://www.consilium.europa.eu/media/43076/26-vc-euco-statement-en.pdf> (accessed 5.12.20).
- Federal Ministry of Finance, 2020. Emerging From the Crisis With Full Strength [WWW Document]. URL <https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Topics/Public-Finances/Articles/2020-06-04-fiscal-package.html> (accessed 6.4.20).
- Galvin, R., Healy, N., 2020. The Green New Deal in the United States: what it is and how to pay for it. *Energy Res. Soc. Sci.* 67, 101529.
- Global Energy Monitor, 2020. Global Coal Plant Tracker [WWW Document]. URL <https://endcoal.org/tracker/> (accessed 6.22.20).

- Hansen, M.H., Li, H., Svarverud, R., 2018. Ecological civilization: interpreting the Chinese past, projecting the global future. *Glob. Environ. Chang.* 53, 195–203.
- Hua, J., Yao, K., 2020. China March Loans Surge to \$405 Billion As Coronavirus Stimulus Kicks in [WWW Document]. Reuters. URL <https://www.reuters.com/article/us-china-economy-loans/china-march-loans-surge-to-405-billion-as-coronavirus-stimulus-kicks-in-idUSKCN21S0VY> (accessed 8.7.20).
- IMF, 2020. World Economic Outlook – Real GDP Growth [WWW Document]. URL https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOORLD/CHN (accessed 6.1.20).
- Korsnes, M., 2019. *Wind and Solar Energy Transition in China*. Routledge, Oxfordshire.
- Le Quéré, C., Jackson, R.B., Jones, M.W., Smith, A.J.P., Abernethy, S., Andrew, R.M., De-Gol, A.J., Willis, D.R., Shan, Y., Canadell, J.G., 2020. Temporary reduction in daily global CO₂ emissions during the COVID-19 forced confinement. *Nat. Clim. Chang.* 1–7.
- Li, F., Song, Z., Liu, W., 2014. China's energy consumption under the global economic crisis: decomposition and sectoral analysis. *Energy Policy* 64, 193–202.
- Markard, J., Rosenbloom, D., 2020. A tale of two crises: COVID-19 and climate. *Sustain. Sci. Pract. Policy* 16, 53–60.
- Meckling, J., Nahm, J., 2019. The politics of technology bans: industrial policy competition and green goals for the auto industry. *Energy Policy* 126, 470–479.
- MOF, N.N., 2020. Opinions on Promoting the Healthy Development of Non-hydro Renewable Power Generation [Original in Chinese] [WWW Document]. URL http://jjs.mof.gov.cn/zhengcefagui/202001/t20200122_3463379.htm (accessed 6.2.20).
- National Energy Administration, 2020. Circular on 2023 Risk and Early Warning for Coal Power Planning and Construction [English Translation] [WWW Document]. URL <https://chinaenergyportal.org/en/circular-on-2023-risk-and-early-warning-for-coal-power-planning-and-construction/> (accessed 6.4.20).
- National People's Congress, 2019. Government Work Report [Original in Chinese] [WWW Document]. URL http://www.gov.cn/premier/2019-03/16/content_5374314.htm (accessed 7.8.20).
- National People's Congress, 2020. 2020 Government Work Report [Original in Chinese] [WWW Document]. URL <http://www.gov.cn/zhuanqi/202010/hzfgzbg/index.htm> (accessed 7.8.20).
- NBS, 2020a. Online Statistical Database – National Data [Original in Chinese] [WWW Document]. URL <http://data.stats.gov.cn/tablequery.htm?code=AD0H> (accessed 6.12.20).
- NBS, 2020b. Statistical Communiqué of the People's Republic of China on 2019 National Economic and Social Development [Original in Chinese] [WWW Document]. URL http://www.stats.gov.cn/tjsj/zxfb/202002/t20200228_1728913.html (accessed 6.12.20).
- NDRC, 2019. Notice on Improving the Wind Power Feed-in Tariff Policy [Original in Chinese] [WWW Document]. URL https://www.ndrc.gov.cn/xxgk/zcfb/tz/201905/t20190524_962453.html (accessed 5.12.20).
- NDRC, 2020a. Notice on Measures to Stabilize and Expand the Consumption of Automobiles. NDRC Industry (2020) No. 684 [Original in Chinese] [WWW Document]. URL https://www.ndrc.gov.cn/xxgk/zcfb/tz/202004/t20200430_1227367.html (accessed 5.12.20).
- NDRC, 2020b. Notice on Matters Relevant to the 2020 Feed-in Tariff Policy for PV Power Generation [Original in Chinese] [WWW Document]. URL https://www.ndrc.gov.cn/xxgk/zcfb/tz/202004/t20200402_1225031.html (accessed 5.12.20).
- NEA, 2020. 2020 Q1 PV Installations Utility and Distributed by Province [English Translation] [WWW Document]. URL <https://chinaenergyportal.org/en/2020-q1-pv-installations-utility-and-distributed-by-province/> (accessed 6.4.20).
- Nengyuan Energy Magazine, 2020. 48 GW Of Coal-fired Power Projects in the First Five Months of 2020, Largely Through Investment From Local Enterprises [Original in Chinese] [WWW Document]. URL <http://www.inengyuan.com/kuaixun/2522.html> (accessed 6.12.20).
- Reuters, 2020. China Says Sticking to Climate Pledges Despite Coronavirus Outbreak [WWW Document]. URL <https://uk.reuters.com/article/us-china-environment-climate/china-says-sticking-to-climate-pledges-despite-coronavirus-outbreak-idUKKBN2390E2> (accessed 6.12.20).
- Rosenbloom, D., Markard, J., 2020. A COVID-19 recovery for climate. *Science* (80-) 368.
- Steffen, B., Egli, F., Pahle, M., Schmidt, T.S., 2020. Navigating the Clean Energy Transition in the COVID-19 Crisis. *Joule* 4, 1137–1141. <https://doi.org/10.1016/j.joule.2020.04.011>.
- Worland, J., 2020. As the Rest of the World Plans a Green Recovery, America Is Once Again Falling Behind [WWW Document]. *TIME Mag.* URL <https://time.com/5835402/green-stimulus-climate-change-coronavirus/> (accessed 5.15.20).
- World Bank, 2010. *Infra Newsletter June 2010 – Supporting China's Infrastructure Stimulus Under the Infra Program* [WWW Document]. URL https://web.archive.org/web/20191205041352/http://siteresources.worldbank.org/INTSDNET/Resources/5944695-124775731647/INFRA_China_Newsletter.pdf (accessed 6.2.20).
- Xinhua News Agency, 2020. China Expedites Issuance of Govt Special Bonds to Fund Infrastructure Projects [WWW Document]. URL http://www.xinhuanet.com/english/2020-04/03/c_138944267.htm (accessed 8.7.20).