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China: Paving the Way to Carbon Neutrality

Introduction

The paper describes the current decarbonization process in accordance with the targets of the 14th Five-Year Plan regarding climate and energy. It also discusses how the measures of the 14th FYP are connected with China's ambition to become carbon-neutral by 2060. The research tests two main hypotheses. One is that China had set a decarbonization date far away enough not to lose its advantage in industrial production. At the same time, this is a less ambitious goal, compared to climate neutrality. The other hypothesis is that China's pledge to become carbon-neutral by 2060 is not limited by its borders and directly affects climate policies of countries that are engaged in the Belt and Road Initiative. The research methods adopted in the paper are quantitative and qualitative. Hypotheses were verified on the basis of official documents in Chinese and on China's energy data and statistics.

In September 2020, Chinese President Xi Jinping announced that China would aim to hit CO₂ peak emissions before 2030 and attain carbon neutrality by 2060, addressing the United Nations General Assembly in New York through a video connection. On this occasion, he called for global efforts to launch a green revolution. He underlined the need for green recovery of the world economy in the post-Covid-19 era and for efforts to achieve sustainable development in all countries.¹ For the first time, China has set a concrete long-term target of carbon neutrality and it is seen

¹ *Xi Jinping zai di qishiwu jie lianheguo dahui yiban xing bianlun shang de jianghua* (习近平在第七十五届联合国大会一般性辩论上的讲话), Xinhua (新华), 22 September 2020, http://www.xinhuanet.com/politics/leaders/2020-09/22/c_1126527652.htm [accessed: 15.04.2020].

as a significant step towards combating climate change and its impacts. The announcement was widely welcomed as the most important commitment since the Paris Agreement that came out of the COP21, the 21st Conference of Parties of the UNFCCC (United Nations Framework Convention on Climate Change) and was adopted on 12 December 2015. With China accounting for almost one third of the global CO₂ emissions, its carbon neutrality pledge is crucial to achieving worldwide net-zero emissions. The CO₂ emission peak target and carbon neutrality have been incorporated into the overall layout of building an ecological civilization.²

It is worth mentioning that China has declared its target to achieve carbon neutrality by 2060, not climate neutrality which was adopted by the European Union by mid-century. Oliver Geden of the German Institute for International and Security Affairs argues that it takes between 10 to 20 years longer to reach climate neutrality than carbon neutrality. This is because some non-CO₂ emissions i.e., nitrous oxide or methane are hard to mitigate and need to be offset by removing CO₂ from the atmosphere.³ It seems that China's long-term plan does not take non-carbon dioxide greenhouse gases into consideration. There is no doubt that carbon dioxide is the most important anthropogenic greenhouse gas in the atmosphere. It alone accounts for approximately 66% of the radiative forcing by long-lived greenhouse gases (LLGHGs). However, methane, nitrous oxide, and fluorinated gases deserve more attention in the climate debate. After carbon dioxide, methane CH₄ is responsible for about 16% of climate change, followed by nitrous oxide N₂O (7%), dichlorodifluoromethane CFC-12 (5%), trichlorofluoromethane CFC-11 (2%), and others (4%).⁴

Actions and challenges for climate protection in China

Since the country initiated reform and opening-up policies in 1978, the economy has experienced tremendous growth. China's gross domestic product surged from 149.5 billion USD in 1978 to 14.3 trillion USD in 2019.⁵ Meanwhile, primary energy consumption in China increased rapidly from 16.6 exajoules in 1978 to 141.7 exajoules in 2019. China remains the world's largest energy consumer, currently accounting for 24.3% of world energy consumption, compared to 6% forty years ago.⁶

² On the concept of ecological civilization see: Ł. Gacek, *Cywilizacja ekologiczna i transformacja energetyczna w Chinach*, WN FNCE, Poznań 2020; J.W. Tkaczyński, Ł. Gacek, *China's Environmental Protection Policy in the Light of European Union Standards*, Vandenhoeck & Ruprecht Verlage Unipress, Göttingen 2021; Pan Jiahua, *China's Environmental Governing and Ecological Civilization*, Springer, Heidelberg 2016; Hu Angang, *China: Innovative Green Development*, Springer, Singapore 2017.

³ O. Geden, Twitter, 23 September 2020, https://twitter.com/Oliver_Geden/status/1308703148723367936 [accessed: 15.04.2020].

⁴ World Meteorological Organization, 'The State of Greenhouse Gases in the Atmosphere Based on Global Observations through 2019', *WMO Greenhouse Gas Bulletin*, no. 16, 23 November 2021.

⁵ The World Bank, *GDP (current US\$) – China*, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=CN> [accessed: 15.04.2020].

⁶ *Statistical Review of World Energy – all data, 1965–2019*, BP Statistical Review of World Energy, June 2020, <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html> [accessed: 15.04.2020].

During the last four decades China has experienced rapid urbanization from 17.92% in 1978 to 60.60% in 2019.⁷ In 2019, more than 848 million people lived in urban regions, in comparison to 552 million in rural ones. That year, the population on the Chinese mainland reached 1.4 billion.⁸ The urbanisation rate is projected to reach 65% in the 2021–2025 period.⁹ This issue is particularly important due to the fact that cities contribute 85% of the total CO₂ emissions in China. They also account for 75% of the country's total GDP and 80% of its energy consumption. Therefore, cities are considered to be the key areas for implementing climate policies on greenhouse gas emissions and encouraging investment in low-carbon infrastructure.¹⁰ High levels of air pollution in urban areas are becoming a serious public health concern in China.

Currently, China is the largest emitter of greenhouse gases in the world. Its annual CO₂ emissions in 2017 were estimated at 10.9 Gt, about 29% of the world's total, compared to 6.3 Gt in 2005 and 2.4 Gt in 1990.¹¹ At present, China is also becoming the highest sulphur dioxide (SO₂), nitrogen oxide (NO), and particulate matter (PM) emitter in the world. On the one hand, China is a major cause of global warming, but on the other, it has a unique chance to redirect the course of global emissions. The Climate Action Tracker estimates that if China meets the target of net-zero CO₂ emissions by 2060, it could reduce global warming by about 0.2 to 0.3 degrees by the end of the century.¹²

PM2.5 and PM10 concentrations in each of 31 province-level regions of China still exceed the WHO Air Quality Guideline.¹³ China faced about 1.24 million premature deaths in 2017 as a result of air pollution, including 851 thousand of ambient PM2.5 pollution, 271 thousand of household air pollution from solid fuels, and 178 thousand of ambient ozone pollution.¹⁴

⁷ *Population, China Statistical Yearbook 2020*, National Bureau of Statistics of China, <http://www.stats.gov.cn/tjsj/ndsjsj/2020/indexeh.htm> [accessed: 15.04.2020].

⁸ *Statistical Communiqué of the People's Republic of China on the 2019 National Economic and Social Development*, National Bureau of Statistics of China, 28 February 2020, http://www.stats.gov.cn/english/PressRelease/202002/t20200228_1728917.html [accessed: 15.04.2020].

⁹ Zhonghua renmin gongheguo guomin jingji he shehui fazhan di shisi ge wu nian guihua he 2035 nian yuanjing mubiao gangyao (中华人民共和国国民经济和社会发展第十四个五年规划和2035年远景目标纲要), Xinhua (新华), 12th March 2021, http://www.xinhuanet.com/2021-03/13/c_1127205564.htm [accessed: 15.04.2020].

¹⁰ Liu Zhu, Cai Bofeng, *High-resolution Carbon Emissions Data for Chinese Cities*, Environment and Natural Resources Program Belfer Center for Science and International Affairs Harvard Kennedy School, June 2018.

¹¹ M. Muntean et al., *Fossil CO₂ emissions of all world countries – 2018 Report*, Publications Office of the European Union, Luxembourg 2018, p. 70.

¹² Climate Action Tracker, *China going carbon neutral before 2060 would lower warming projections by around 0.2 to 0.3 degrees C*, 22 September 2020, <https://climateactiontracker.org/press/china-carbon-neutral-before-2060-would-lower-warming-projections-by-around-2-to-3-tenths-of-a-degree> [accessed: 15.04.2020].

¹³ L. Myllyvirta, *Air pollution in China 2019*, Centre for Research on Energy and Clean Air, Centre for Research on Energy and Clean Air, January 2020.

¹⁴ Peng Yin et al., 'The effect of air pollution on deaths, disease burden, and life expectancy across China and its provinces, 1990–2017: an analysis for the Global Burden of Disease Study 2017', *Lancet Planet Health* 2020, vol. 4, pp. e386–e398.

China's air pollution still remains a serious problem, even though Beijing adopted more systematic and intensive national and regional control measures. On 10 September 2013, the State Council issued an action plan for preventing pollution and conducting air quality control in China for the 2013–2017 period. The plan envisaged reducing coal consumption and shutting down selected industrial plants. These measures were meant to contribute to significant improvements in urban air quality. The target for 2017 was to reduce PM_{2.5} emissions in Beijing, Tianjin, and Hebei province by 25%, in the Yangtze River delta by 20%, and in the Pearl River delta by 15% from the 2012 levels. In the remaining areas, the concentration of PM₁₀ was to fall by about 10%.¹⁵ In December 2017, China presented a five-year plan to promote clean heating in the north of the country, which forecast an increase in such heating solutions from 34% in 2017 to 50% in 2019 and 70% from 2021 onwards. The target in the most polluted areas like Beijing, Tianjin, and the 26 cities in Hebei, Shanxi, Shandong, and Henan was set for 100% by 2021.¹⁶ In July 2018, the State Council introduced the 2018–2020 Three-year Action Plan for Winning the Blue Sky War (or Three-Year Action Plan). It mainly focused on the Beijing-Tianjin-Hebei area, the Yangtze River delta, and the Fen-Wei Plain in Shanxi, Shaanxi, and Henan provinces, where air pollution was the highest.¹⁷

Over the last few years, China has enacted a law targeting not only air pollution (amendment to the Law on Prevention and Control of Air Pollution, 2015), but also water (amendment to the Law on the Prevention and Control of Water Pollution, 2017) and soil (Soil Pollution Prevention and Control Law, 2018). Decoupling economic growth and pollution has become the focus in developing the concept of ecological civilization. Since taking office in 2013, President Xi Jinping has been trying to link ecological civilization with realizing 'the dream of a great revival of the Chinese nation.' It emphasises the need to concentrate on protecting resources and the environment, as well as promoting green and low-carbon development.¹⁸ The concept of ecological civilization has been recognized in the Party's statute as part of the Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era. Its significance is supported by the fact that it was also included in the content of the Basic Law of 4 December 1982, as amended in 2018. References to ecological

¹⁵ Guowuyuan guanyu yinfa daqi wuran fangzhi xingdong jihua de tongzhi (guofa [2013] 37 hao) (国务院关于印发大气污染防治行动计划的通知 (国发 [2013] 37号), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), 10 September 2013, http://www.gov.cn/zwgk/2013-09/12/content_2486773.htm [accessed: 15.04.2020].

¹⁶ Beifang diqu dongji qingjie qunuan huihua (2017–2021) (北方地区冬季清洁取暖规划 (2017–2021), Guojia fazhan he gaige weiyuanhui (国家发展和改革委员会), December 2017, <http://www.gov.cn/xinwen/2017-12/20/5248855/files/7ed7d7cda8984ae39a4e9620a4660c7f.pdf> [accessed: 15.04.2020].

¹⁷ Guowuyuan guanyu yinfa daying lantian baowei zhan san nian xingdong jihua de tongzhi (guofa [2018] 22 hao) (国务院关于印发打赢蓝天保卫战三年行动计划的通知 (国发 [2018] 22号)), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), 3 July 2018, http://www.gov.cn/zhengce/content/2018-07/03/content_5303158.htm [accessed: 15.04.2020].

¹⁸ *Shengtai wenming guiyang guojì luntan 2013 nian nianhui kaimu. Xi Jinping zhi hexin* (生态文明贵阳国际论坛2013年年会开幕. 习近平致贺信), Xinhua (新华), 20 July 2013, http://www.xinhuanet.com//politics/2013-07/20/c_116619686.htm [accessed: 15.04.2020].

civilization have also appeared in the amendment to the Environmental Protection Law of 26 December 1989 and the Law of 24 April 2014, which entered into force on 1 January 2015.

Another important change was the decision to reform the Ministry of Environment Protection. It was replaced by two new ministries which were set up in March 2018. The first, the Ministry of Ecology and Environment was entrusted with the task of enforcing environmental and climate change legislation. It took responsibility for managing greenhouse gas emissions and combating the negative effects of climate change. The second, the Ministry of Natural Resources is responsible for managing domestic natural resources, like water, soil, and minerals.

China's 14th Five-Year Plan on climate targets

On 11 March 2021, the National People's Congress at the Two Sessions in Beijing approved the 14th Five-Year Plan (2021–2025) and long-term targets for 2035. The document outlines the direction of the country's economic and social development. It also provides several important climate and energy targets for the next five years. This is the first Five-Year Plan published since China's pledge to be carbon-neutral by 2060. In September 2020, Chinese President Xi Jinping announced that China would aim to peak carbon emissions by 2030 and reach carbon neutrality by 2060. Unlike in the previous two FYPs, this time China did not meet a five-year GDP target. The 14th FYP only included a GDP target for 2021 at the level of 6%.¹⁹ The decision to eschew a five-year GDP growth target will most likely positively impact the future climate policy, as it should reduce the pressure from local governments which until now have emphasized the importance of achieving growth targets at all costs.

The current plan is based on the approaches of previous FYPs to setting energy intensity and carbon intensity targets (Table 1). For the 2021–2025 period, China has set a goal of reducing energy intensity per unit of GDP by 13.5% and carbon emissions by 18% from the 2020 levels.²⁰ The new target of reducing energy use is slightly lower than the 15% goal the country aimed for in its previous FYP.

China also intends to increase the share of non-fossil fuel in primary energy to 'around 20%'. This is important for at least two reasons. Firstly, it clearly indicates that the increase remains at a similar level to the two previous FYPs. Secondly, the energy mix was not included in the section of the 'binding targets' in the current FYP.

¹⁹ Zhonghua renmin gongheguo guomin jingji he shehui fazhan di shisi ge wu nian guihua he 2035 nian yuanjing mubiao gangyao, *op. cit.*

²⁰ *Ibidem.*

Table 1. China's Five-Year Plans climate related targets

Target	13 th FYP Target (2016–2020)	14 th FYP Target (2021–2025)
Energy intensity	-15%	-13.5%
Carbon intensity	-18%	-18%
Share of non-fossil fuels	15% in 2020	around 20% in 2025
Forest coverage	23.04% in 2020	24.1% in 2025
GDP growth	on average 6.5% annually from 2016–2020	annual target only 2021 at least 6%

Source: own work based on: Zhonghua renmin gongheguo guomin jingji he shehui fazhan di shisi ge wu nian guihua he 2035 nian yuanjing mubiao gangyao (中华人民共和国国民经济和社会发展第十四个五年规划和2035年远景目标纲要), Xinhua (新华), 12 March 2021, http://www.xinhuanet.com/2021-03/13/c_1127205564.htm [accessed: 15.04.2020]; Zhonghua renmin gongheguo guomin jingji he shehui fazhan di shisan ge wu nian guihua gangyao (中华人民共和国国民经济和社会发展第十三个五年规划纲要), Xinhua (新华), 17 March 2016, http://www.gov.cn/xinwen/2016-03/17/content_5054992.htm [accessed: 15.04.2020].

The transition from fossil fuels to renewable energy sources should be seen in a long-term perspective. During the 13th Five-Year-Plan period, China appeared to be making some progress towards reducing its dependence on fossil fuels, mainly coal. On the consumption side, coal use declined by 8% in the past five years to 56.8% in 2020. According to the data released by China's National Bureau of Statistics, the share of clean energy consumption in China rose from 19.1% in 2016 to 24.3% in 2020.²¹ On 12 December 2020, at the UN Climate Ambition Summit, Xi Jinping announced that China would achieve over 1,200 GW solar and wind power installed capacity by 2030 and increase the share of non-fossil fuels in primary energy consumption to around 25% by 2030.²² By the end of 2020, China had more than 281 GW of wind generation capacity and more than 253 GW of solar generation capacity. It amounts to about 24% of its total power generation capacity of 2,200 GW (Table 2). In 2020, only China added 71 GW of new wind power capacity and 48 GW of new solar power capacity.²³

²¹ Zhonghua renmin gongheguo 2020 nian guomin jingji he shehui fazhan tongji gongbao (中华人民共和国2020年国民经济和社会发展统计公报), Guojia tongji ju (国家统计局), 28 February 2021, http://www.xinhuanet.com/fortune/2021-03/01/c_1127152023.htm?utm_source=CD+bilingual+newsletter_Outside+China&utm_campaign=c831726f9f-EMAIL_CAMPAIGN_2019_05_23_03_03_COPY_02&utm_medium=email&utm_term=0_fea4a231d4-c831726f9f-46922770&mc_cid=c831726f9f&mc_eid=bd1786cd4f [accessed: 15.04.2020].

²² Xi Jinping zai qihou xiongxin fenghui shang de jianghua. Jiwang-kailai, kaiqi quanqiu yingdui qihou bianhua xin zhengcheng (习近平在气候雄心峰会上的讲话。继往开来，开启全球应对气候变化新征程), Xinhua (新华), 12 December 2020, https://www.ccps.gov.cn/xsxxk/zyls/202012/t20201213_145612.shtml [accessed: 15.04.2020].

²³ Guojia nengyuan ju fabu 2020 nian quanguo dianli gongye tongji shuju (国家能源局发布2020年全国电力工业统计数据), Guojia nengyuan ju (国家能源局), 20 January 2021, http://www.nea.gov.cn/2021-01/20/c_139683739.htm [accessed: 15.04.2020]; 2020 nian quan shehui yong dian liang tongbi zengzhang 3.1% (2020年全社会用电量同比增长3.1%), Guojia nengyuan ju (国家能源局), 20 January 2021, http://www.nea.gov.cn/2021-01/20/c_139682386.htm [accessed: 15.04.2020].

Table 2. Installed power generation capacity in China

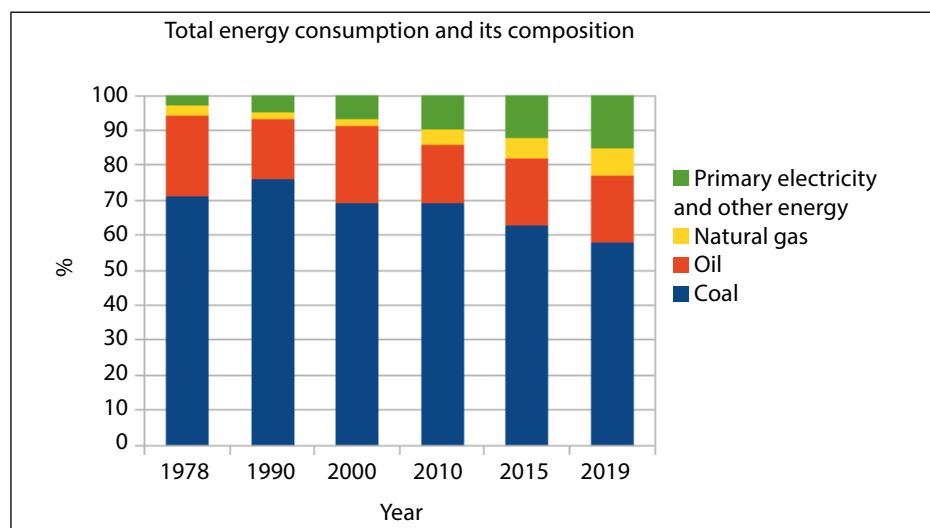
	Gigawatts (GW)	Percent (%)
Total power generation capacity	2,200.58	+9.5
Hydro	370.16	+3.4
Thermal	1,245.17	+4.7
Nuclear	49.89	+2.4
Wind	281.53	+34.6
Solar	253.43	+24.1

Source: own work based on: Guojia nengyuan ju fabu 2020 nian quanguo dianli gongye tongji shuju (国家能源局发布2020年全国电力工业统计数据), Guojia nengyuan ju (国家能源局), 20 January 2021, http://www.nea.gov.cn/2021-01/20/c_139683739.htm [accessed: 15.04.2020].

Despite these promising results, China approved a number of new coal power plants last year, raising questions about its commitment to the limitation of its greenhouse gas emissions in order to reach the goals of the Paris Agreement.

Is China returning to coal-fired power?

There is no doubt that coal is the driving force of the Chinese economy. The country's energy system is still reliant on coal in more than half (Graph 1). Currently, China has more total installed capacity of coal power than the rest of the world combined.



Source: own work based on: *Energy, China Statistical Yearbook 2020*, National Bureau of Statistics of China, <http://www.stats.gov.cn/tjsj/ndsj/2020/indexeh.htm> [accessed: 15.04.2020].

It is a promising sign that in its coal industry development strategy, the China National Coal Association proposes to limit China's coal output up to 4.1 billion

tonnes and consumption to 4.2 billion tonnes by 2025. In comparison to the 13th FYP released by the China Energy Administration, the targets were to cap the annual coal consumption to around 4.1 billion tonnes and coal output to 3.9 billion tonnes by 2020. Coal will still play a crucial role in balancing the domestic energy supply. Therefore, its consumption will continue to grow. CNCA also suggested reducing the number of domestic coal mines to 4,000 by the end of 2025 through closures, mergers and acquisitions, from about 4,700 at the end of 2020 and 5,300 in 2019. More than 1000 coal mines will be equipped with smart mining technology.²⁴ This target should be included in the energy sector plan for the second half of 2021. It also indicates that the government could target peaking coal consumption before 2025. However, peaking and declining CO₂ emissions requires stopping the growth of coal consumption in absolute terms. China is facing great challenges to accomplish coal phaseout in the next three decades.

The *China Low-Carbon Development Strategy and Transformation Pathways* report, released on 12 October 2020 by the Institute for Climate Change and Sustainable Development at the Tsinghua University (ICCS) and 18 other major Chinese research organizations, indicated that immediate cuts to total energy consumption were required to achieve carbon neutrality. In the low-carbon development pathway, coal would provide less than 5% of the country's energy and less than 10% in the power sector. This would mean closing down most of the existing coal-fired power units and coal mines operating in China.²⁵ According to a report published by Global Energy Monitor, in order to meet the goal of net-zero carbon emissions by 2060 goal, China should significantly reduce the number of its existing coal plants. However, this number is likely to increase during the 14th FYP period, as a total of 247 GW of coal power is now being planned or developed. In 2020, China commissioned 38.4 GW of new coal-power plants.²⁶ Unsurprisingly, Zhejiang, Anhui, and Shandong provinces, as well as province prefectures located within Shanxi, including Jinzhong, Yuncheng and Luliang, failed to meet coal consumption reduction targets set in the 13th FYP.²⁷ Overall coal consumption targets were not set under the 14th Five-Year Plan. Without setting very ambitious decarbonization goals China could try to extract concessions on the international stage, which was increasingly mentioned as existential threats to its power, including its core

²⁴ 2020 meitian hangye fazhan niandu baogao (2020煤炭行业发展年度报告), Zhongguo meitan gongye xiehui (中国煤炭工业协会), March 2021, <https://www.cctd.com.cn/uploadfile/2021/0304/20210304104603452.pdf> [accessed: 15.04.2020].

²⁵ L. Myllyvirta, *Influential academics reveal how China can achieve its 'carbon neutrality' goal*, Carbon Brief, 14 October 2020, <https://www.carbonbrief.org/influential-academics-reveal-how-china-can-achieve-its-carbon-neutrality-goal> [accessed: 15.04.2020].

²⁶ *China Dominates 2020 Coal Plant Development*, Global Energy Monitor, Center for Research on Energy and Clean Air, February 2021, <https://globalenergymonitor.org/wp-content/uploads/2021/02/China-Dominates-2020-Coal-Development.pdf> [accessed: 15.04.2020].

²⁷ *Guojia fagaiwei: Zhe Wan Lu deng di "shisanwu" meitan xiaofei jian liang mubiao wei dacheng* (国家发改委: 浙皖鲁等地“十三五”煤炭消费减量目标未达成), Pengpai xinwen (澎湃新闻), 10 February 2021, https://www.thepaper.cn/newsDetail_forward_11306259 [accessed: 15.04.2020].

interests related to Taiwan, Hong Kong, Tibet, Xinjiang, and its claims in the South China Sea, as well as trade and technology negotiations with the United States.²⁸

The Covid-19 downturn might prompt Chinese provinces to encourage investment in traditional infrastructure such as coal power plants. It still seems to be the easiest way to stimulate local economies in the wake of a deep economic recession triggered by the Covid-19 pandemic. Currently, China is concentrating its post-pandemic recovery on high carbon energy investments. This scenario would likely duplicate the well-known solutions from the past. As a response to the 2008–2009 global financial crisis, China introduced the largest stimulus package worth 4 trillion RMB (586 billion USD) by the end of 2008.²⁹ The crisis was the worst economic disaster since the Great Depression of 1929. Over the next two years, the money was spent on upgrading infrastructure, particularly on building new roads, railways, subways, airports, and power grids; and on rebuilding the central mountainous regions of Sichuan province in southwestern China, devastated by the so-called Great Wenchuan Earthquake on 12 May 2008. However, it seems that repeating the record growth in CO₂ emissions after the 2008–2009 crisis is unlikely. The current scale of China's Covid-19 stimulus package is far smaller than the previous one. On 22 May 2020, the central government launched a 3.6 trillion RMB (506 billion USD) fiscal stimulus package. It differs from the 2008 package in both size and target. The current package includes local government bonds for Covid-19 control and business tax cuts. The government emphasized the priority of new infrastructure including the development of next-generation information networks and new energy vehicles battery charging stations. The plan might stimulate new consumer demand and industrial upgrading. It also promotes building a new type of urbanization through improving public facilities and services in county seats, renovating old urban residential communities, supporting the upgrade of plumbing and wiring and installation of elevators in old residential buildings, and encouraging the development of community services. Additionally, the recovery plan stresses the need to develop major transportation and water conservation projects.³⁰ A key question in the Chinese climate policy is how provinces, especially those heavily reliant on fossil fuels, can get ready for the transition of their economies and the growth of investments in renewable energy and advanced energy storage technologies.

The future colour of BRI: green or black?

The debate on China's impact on climate change should include its investments in various energy projects in other countries in the Belt and Road Initiative (BRI).

²⁸ M. Standaert, *Despite Pledges to Cut Emissions, China Goes on a Coal Spree*, Yale Environment 360, 24 March 2021, <https://e360.yale.edu/features/despite-pledges-to-cut-emissions-china-goes-on-a-coal-spree> [accessed: 15.04.2020].

²⁹ Woguo caizheng he huobi zhengce tongshi tiaozheng 4 wan yi zijin li qiao neixu (我国财政和货币政策同时调整 4 万亿资金力撬内需), Zhongyang zhengfu menhu wangzhan (中央政府门户网站), 10 November 2008, http://www.gov.cn/jrzg/2008-11/10/content_1143810.htm [accessed: 15.04.2020].

³⁰ Zhengfu gongzuo baogao (政府工作报告), 22 May 2020, http://www.gov.cn/gongbao/content/2020/content_5517495.htm [accessed: 15.04.2020].

Chinese investment in energy, transport, and other sustainable infrastructure may hold back the development of new technologies for decades to come and is affecting the development paths of many countries that are part of the BRI, particularly China's neighbouring countries.³¹ The Belt and Road Initiative, first proposed by China in 2013, has opened the door to expansion abroad for domestic companies in the clean and renewable energy sector. China has begun to emphasize the importance of building high-quality, sustainable, resilient, environment-friendly, and inclusive infrastructure. This approach was signalled at the 1st Belt and Road Forum in 2017, when the idea of creating an international coalition for green development within the BRI was launched.³² During the 2nd Forum in 2019, China committed to launching green infrastructure projects in the countries participating in the initiative. However, the proposals put forward by China did not identify concrete pathways to gradually reducing funding for high-pollution projects.³³ Since its announcement in 2013, the Belt and Road Initiative has prioritized energy projects. Today, many of the participant countries are facing serious energy shortages and they require significant investment in the sector in the coming years. Chinese developers have so far given primacy to 'dirty energy' investments, making considerable use of the state support.

According to the Global Coal Plant Tracker data, in 2018, China was engaged in financing a quarter of coal plants under development overseas, with a total capacity of 102 GW. The parties involved in carrying out the projects are state-owned banks, i.e., the China Development Bank, the Export-Import Bank of China, the Bank of China, and Industrial Bank of China, as well as mostly large state-owned enterprises, including the State Grid Corporation of China, China Energy Engineering Corporation, State Power Investment Corporation, and China Huadian Corporation.³⁴ Moreover, China has emerged as the largest provider of official development finance (ODF) for projects in the energy sector. Most of the projects were funded by the China Development Bank and the Export-Import Bank of China and built by Chinese enterprises. Bo Kong and Kevin Gallagher pointed out that the Chinese ODF for the power sector has mainly been poured into coal-fired power (45.3%) and hydropower (33.8%) overseas. In contrast, it was only 2.6% for realisation of wind and solar projects. In the years 2000–2017, China's two policy banks loaned over 251.3 billion USD to overseas energy sector projects. At the time, they financed a total of 11 wind and solar projects in seven different countries, worth over 2 billion USD.

³¹ R. Kwieciński, 'Zmiana w polityce zagranicznej Chin w erze Xi Jinpinga', *Krakowskie Studia Międzynarodowe* 2020, no. 1, pp. 95–98.

³² *Xi Jinping zai 'yadai yilu' guoji hezuo gaofeng luntan kaimu shi shang de yanjiang* (习近平在“一带一路”国际合作高峰论坛开幕式上的演讲), *Xinhua* (新华), 14 May 2017, http://www.xinhuanet.com//2017-05/14/c_1120969677.htm [accessed: 15.04.2020].

³³ *Xi Jinping zai di er jie "yadai yilu" guoji hezuo gaofeng luntan kaimu shi shang de zhuzhi yanjiang* (习近平在第二届“一带一路”国际合作高峰论坛开幕式上的主旨演讲), *Xinhua* (新华), 26 April 2019, http://www.xinhuanet.com/silkroad/2019-04/26/c_1124420187.htm [accessed: 15.04.2020].

³⁴ Ch. Shearer, M. Brown and T. Buckley, *China at a Crossroads: Continued Support for Coal Power Erodes Country's Clean Energy Leadership*, Institute for Energy Economics and Financial Analysis, January 2019.

On the one hand, the loan applications are evaluated on the basis of their profitability, risk assessment, and compatibility with the local development strategies. On the other, requests for loans for clean energy development projects, set by other governments, have a very low priority.³⁵ According to Bo Kong and Kevin Gallagher, overseas clean energy projects financed through Chinese ODF 'are the result not just of a "push" from China but also a "pull" from host countries.' However, the 'pull' is too weak to incentivize more Chinese ODF in the field of renewable power abroad.³⁶

Conclusions

The transition from fossil fuels to electricity and renewable energy sources is essential for both the climate and the environment. Since China announced the ratification of the Paris Agreement, it has made progress in its fight against climate change and also taken on a larger climate role on the global stage. The new targets in the 14th FYP signal further transition towards a more sustainable growth model. In recent years, China has continued a structural transformation based on shifting the mix of its fuel consumption. Even though coal is still the principal domestic energy source, and it plays a crucial role in the economic growth, Beijing prioritizes investing in renewable energy. China reduces coal output as a result of the government's simultaneous initiatives to curb carbon emissions. Currently, China has the world's largest installed capacity of hydro, wind and solar power. It now produces more solar, wind and hydro power than the United States and the European Union combined, and it has also become a major source of investment for the clean energy sector globally.

Other fuels, such as renewables, natural gas, and nuclear power, are expected to become more important in China's electricity generation. China needs to increase that share in its electricity generation, as well as to reduce burning fossil fuels which release large amounts of carbon dioxide and other greenhouse gases into the atmosphere.

One of the challenges to energy reform is visible in northern China's strong reliance on fossil fuels and heavy industry. Therefore, the reform should concentrate on limiting the growth potential of conventional energy sources. Renewables will be far from replacing fossil fuel sources as long as the energy storage problem is not solved. However, the main barrier for the implementation of energy policies is the centralized mode of governing which requires the compliance of local governments. This explains why local governments have introduced more preferential policies for the coal sector and have provided subsidies for fossil fuels extraction operations so far. It is alarming that China is still building new coal-fired power plants. Although China's economic blueprint signals more investment in the coal power sector in the nearest

³⁵ Bo Kong, K. Gallagher, 'Chinese development finance for solar and wind power abroad', *GCI Working Paper 009*, Global Development Policy Center, Boston University, January 2020.

³⁶ *Idem*, 'Inadequate demand and reluctant supply: The limits of Chinese official development finance for foreign renewable power', *Energy Research & Social Science* 2021, vol. 71, pp. 101838.

future, it should be treated as a response to the recession triggered by the Covid-19 pandemic. In the past, local governments placed priority on investing in traditional infrastructure required to stimulate economic growth. Nevertheless, there are many indications that this can only be a temporary solution. China's leaders have already recognized renewable energy industries as one of the most important driving forces of economic growth. China's carbon neutrality pledge is crucial for international efforts to limit global warming and its related effects. To meet this goal China must continue further expansion of non-fossil fuel (renewables and nuclear energy), take action to improve energy efficiency, develop hydrogen industry, and accelerate the removal of CO₂ emissions from the atmosphere using carbon capture and storage technology. China also needs to address the issue of non-carbon dioxide greenhouse gases, even though long-term targets did not include it.

Moreover, the declared target must be considered in the context of the Chinese overseas investments in the Belt and Road Initiative countries. After all, China's commitment to become carbon-neutral by 2060 may negatively affect environmental conditions in these countries, as Chinese companies can export their emissions abroad. Chinese investment in energy, transport, and other sustainable infrastructure may potentially hamper the development of new technologies for decades to come and is already affecting the development paths of many countries that are part of the BRI, particularly China's neighbouring countries in Central and Southeast Asia. In response to global climate changes, these countries are currently drawing up independent strategies for the development of the energy sector. As part of the Paris Agreement, Chinese partners define their own programmes to reduce national emissions and combat climate change, with consideration given to the Agreement's targets and priority sectors. Therefore, choosing the right type of infrastructure to invest in is crucial if the BRI countries aim to eradicate poverty and achieve the Sustainable Development Goals set by the United Nations for 2030. Yet, the question remains: how does China's ambition to become a global climate leader correlate with the investment policy in the BRI?

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Chiny: w drodze do neutralności węglowej

Streszczenie

Zmiany klimatu to jedno z największych wyzwań, przed jakim stanęła ludzkość w XXI w., wpływają bowiem na różnorodność biologiczną, oddziałują na wiele sektorów gospodarki i społeczeństwo. Te zagrożenia wymagają w długiej perspektywie czasowej podjęcia międzynarodowej współpracy w walce z globalnym ociepleniem, przy jednoczesnym dążeniu państw do zapewnienia zrównoważonego rozwoju. Zmieniająca się rola Chin w globalnych mechanizmach zarządzania klimatem w coraz większym stopniu przykuwa uwagę społeczności międzynarodowej. W marcu 2021 r. Chiny przedstawiły 14. Plan Pięcioletni na lata 2021–2025, który określił, w jaki sposób ta największa światowa gospodarka i jednocześnie największy światowy emitent gazów cieplarnianych zamierza zrealizować cel osiągnięcia zerowej emisji netto do 2060 r. W artykule skonfrontowano obecny proces dekarbonizacji z celami energetyczno-klimatycznymi uwzględnionymi w 14. Planie Pięcioletnim. Analizie poddano środki działania, jakie Chiny zamierzają podjąć w związku z realizacją celu neutralności węglowej do 2060 r.

Słowa kluczowe: Chiny, neutralność węglowa, zmiany klimatyczne, energetyka węglowa, energia odnawialna, Inicjatywa Pasa i Drogi, urbanizacja, zanieczyszczenie powietrza

China: Paving the Way to Carbon Neutrality

Abstract

Climate change is one of the biggest challenges facing our planet in the 21st century, having a significant impact on ecosystems, economies, and communities. It poses a significant long-term threat which demands international cooperation to combat global warming, while achieving sustainability. In this regard, the changing role of China in the

global climate governance mechanisms has increasingly become a focus of international attention. In March 2021, China released its 14th Five-Year Plan for 2021–2025, which presented few details on how this global economic superpower and the largest global greenhouse gases emitter would meet its target of reaching net-zero emissions by 2060. The paper describes the current decarbonization process in accordance with the targets of the 14th FYP regarding climate and energy. It also discusses how the measures of the 14th FYP are connected with China's ambition to become carbon-neutral by 2060.

Key words: China, carbon neutrality, climate change, coal-fired power, renewable energy, Belt and Road Initiative, urbanization, air pollution

China: Weichenstellung für die Klimaneutralität *Zusammenfassung*

Der Klimawandel ist eine der größten Herausforderungen unseres Planeten im 21. Jahrhundert und hat signifikante Auswirkungen auf Ökosysteme, Wirtschaftssysteme und Gesellschaften. Er stellt eine beträchtliche langfristige Gefahr dar, die die internationale Zusammenarbeit erfordert, um die globale Erwärmung zu bekämpfen und Nachhaltigkeit zu erreichen. Diesbezüglich ist die im Wandel begriffene Rolle Chinas im Zusammenhang mit den globalen Klima-Steuerungsmechanismen immer stärker in den Fokus der Öffentlichkeit gerückt. Im März 2021 hat China den 14. Fünfjahresplan für 2021–2025 veröffentlicht, in dem nur wenige Details bekannt gegeben wurden, wie diese globale wirtschaftliche Supermacht und gleichzeitig der weltweit größte Treibhausgasemittent das selbst gesetzte Netto-Nullemissionsziel bis 2060 erreichen will. Der Text beschreibt den laufenden Dekarbonisierungsprozess nach Maßgabe der Klima- und Energieziele des 14. Fünfjahresplans. Außerdem wird erörtert, wie die Maßnahmen des 14. Fünfjahresplans mit Chinas Ambitionen einhergehen, bis 2060 klimaneutral zu werden.

Schlüsselwörter: China, Klimaneutralität, Klimawandel, Kohlestrom, erneuerbare Energien, Neue Seidenstraße, Verstädterung, Luftverschmutzung

Китай: на пути к углеродной нейтральности *Резюме*

Изменение климата является одной из самых серьезных проблем, с которой столкнулось человечество в XXI веке, поскольку это влияет на биоразнообразие и затрагивает многие сектора экономики и общества. В долгосрочной перспективе существующие угрозы требуют развития международного сотрудничества в борьбе с глобальным потеплением, а также должны учитывать стремление государств обеспечить устойчивое развитие. Меняющаяся роль Китая в глобальных механизмах управления климатом все больше привлекает внимание международного сообщества. В марте 2021 г. Китай представил 14-й пятилетний план на 2021–2025 гг., в котором излагается, как эта крупнейшая мировая экономика и в то же время крупнейший мировой производитель парниковых газов, намерен добиться чистых, нулевых выбросов к 2060 г. В статье процесс декарбонизации сопоставляется с возможностями достижения целей в области энергетики и климата, включенными в 14-й пятилетний план. Анализируются меры, которые Китай намерен предпринять в связи с достижением цели углеродной нейтральности к 2060 г.

Ключевые слова: Китай, углеродная нейтральность, изменение климата, угольная энергетика, возобновляемые источники энергии, инициатива «Пояс и дорога», урбанизация, загрязнение воздуха