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# Navigating dilemmas: China's environmental policies and their implications for climate change, resource management, and future generations

**Yuvraj Kumar**[1]

St. Paul's School, London

Yuviyukt@googlemail.com

**Abstract.** This research paper critically examines China's role as the world's largest emitter of carbon dioxide and its pivotal position in global climate change mitigation efforts. The analysis encompasses China's environmental policies initiated since 1979, formally approved by the legislative body, the NPC, in 1989. Though significant economic developments were made since the country's reform and opening in 1979, it is acknowledged that this progress has been accompanied by substantial environmental degradation. In response, the government amended environmental laws in 2014, reflecting a commitment to address these challenges. However, this paper contends that substantial efforts are still required to achieve meaningful environmental improvement. The research further delves into the anticipated impacts of Chinese policies on crucial aspects, namely Climate Change, Resource Management, and the well-being of Future Generations, providing comprehensive insights into the multifaceted implications of China's environmental trajectory.

**Keywords:** carbon emission mitigation; environmental refugees; green investment; greenhouse gas; natural resource rent; nuclear energy; renewable energy

## 1. Introduction:

China holds the title of being the largest emitter of greenhouse (GHG) gases worldwide, releasing an annual total of 12.7 billion metric tons of carbon dioxide emissions. Over the course of more than a century, beginning in 1850 and extending to the present day, China has contributed a substantial 284 billion tons of carbon dioxide emissions into the Earth's atmosphere (Friedman, 2023). This extended period of carbon emissions has had far-reaching consequences for the global environment, influencing climate patterns, air quality, and the delicate balance of ecosystems across the planet.

[1] **Yuvraj Kumar** is a senior high school student in the upper eighth form (Standard 13) at St. Paul's School in London. He has been an international chess player and has a profound interest in environmental and climate change matters. His academic pursuits have been acknowledged by his acceptance to the prestigious Oxford University-PROMYS (*Program in Mathematics for Young Scientists*) 2023 summer camp.

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The swift and substantial growth of China's economy since the reform and opening （改革开放 Gǎigé kāifàng）of 1978, coupled with a relatively lenient approach to environmental regulations, has given rise to a plethora of ecological challenges within and outside the nation (World Bank Report, 2022). These challenges have not gone unnoticed, and the Chinese government has felt mounting pressure from the public and international bodies to address and rectify these pressing environmental issues. Consequently, the central government of China under the leadership of president Xi Jinping （习近平, 1953-）has initiated a series of measures aimed at curbing pollution and enhancing the overall environmental landscape of the country (Chen et al, 2021). Nonetheless, despite these efforts, the government's response has come under scrutiny, with critics contending that the actions taken thus far are insufficient to tackle the magnitude of the problem (Zhao et al, 2022).

The effectiveness of these measures has been further hindered by local authorities who, driven by corruption and an unwillingness to cooperate, have obstructed enforcement efforts, impeding the progress towards cleaner and more sustainable practices within their respective regions. One prominent factor contributing to this resistance is the prevalent national policy that predominantly assesses the performance of regions based on their economic development, inadvertently encouraging a focus on growth at the expense of environmental protection.

However, there is a glimmer of hope on the horizon. In April 2014, recognizing the pressing need to combat pollution and prioritize environmental protection, the Chinese government took a significant step by amending its environmental law (Chinese Government Website, 2014) that became effective from 1 January 2015. The Chinese government has not been indifferent to environmental protection; in fact, it has consistently shown a commitment to safeguarding the environment since as early as 1989. Key legislation was adopted and promulgated during that time to address environmental concerns. The 2014 amendment, however, symbolizes a more comprehensive commitment to rebalancing the interplay between economic expansion and environmental stewardship. This amendment marks a potential turning point in China's environmental trajectory. Another significant set of policies from the Chinese government on environmental and climate change matters includes the unveiling of the 14th Five-Year Plan for a Modern Energy System by the National Development and Reform Commission2 (国家发展和改革委员会 Guójiā fāzhǎn hé gǎigé wěiyuánhuì) and the National Energy Commission3 (国家能源委员会 Guójiā néngyuán wěiyuánhuì) in March 2022, along with the issuance of the Guidelines for Achieving Carbon Dioxide Peaking and Carbon Neutrality by the State Council4 (国务院, Guówùyuàn) in October 2021.

Between 2006 and 2017, China achieved a remarkable 70 percent reduction in sulphur dioxide levels, reflecting a significant improvement in air quality. Notably, during the period from 2013 to 2018, there was a discernible decline in air pollution across the country, highlighting the positive strides made in environmental conservation (Gasparini, 2020).

China's dedication to renewable energy sources has been nothing short of impressive. In 2017, global investments in renewable energy reached a staggering total of US$279.8 billion, and China played a pivotal role in this scenario, contributing US$126.6 billion, which accounts for a substantial 45% of the entire global investments in this sector (Frankfurt School, 2018). This resounding commitment to renewable energy has propelled China to the forefront, making it the world's foremost investor, producer, and consumer of renewable energy. The nation has taken the lead in manufacturing cutting-edge technologies, such as state-of-the-art solar panels, wind turbines, and hydroelectric energy facilities. Furthermore, China now boasts the distinction of being the largest global manufacturer of

[2] Known as NDRC and was founded in 1952.

[3] Renamed from National energy administration to National energy commission in 2010.

[4] The State Council of the People's Republic of China is the chief administrative authority and the national cabinet of China.

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electric cars and buses, underscoring its influential presence in the green transportation sector. (Yang, 2023).

Moreover, China's resolute dedication to curtailing GHG emissions has had a profound global impact. By actively participating in the reduction of emissions, China has played a pivotal role in driving down the worldwide costs associated with wind and solar power. In 2022, China attained an almost exclusive dominance in the worldwide export market for solar cells, representing 83.8% of the total, as reported by Natixis, a French corporate and investment bank. This, in turn, has significantly contributed to the increased adoption and utilization of renewable energy on a global scale.

## 2. China's Environmental Policies: Imperative Measures and Persistent Challenges:

On September 13, 1979, China introduced its first environmental law, the "Environmental Protection Law of the People's Republic of China (Trial Implementation)," marking the commencement of environmentally responsible governance in the country. In 1981, the State Council (Executive Body of the government) issued the "Decision on Strengthening Environmental Protection during the Period of National Adjustment of Economy," introducing the principle of "polluter pays" as a fundamental tenet. In 1982, the "Interim Measures for the Collection of Pollutant Discharge Fees" were enacted, formally establishing the pollutant discharge fee system. These legislative developments represent significant milestones in China's environmental governance journey, demonstrating the nation's commitment to managing its environment in accordance with the rule of law. However, "The Environmental Protection Law of the People's Republic of China" was initially approved during the 11th session of the Standing Committee of the Seventh National People's Congress (NPC, the legislative body of the government) on December 26, 1989. It was amended in the 2014 and effective from 1 January 2015.

China's Environmental Protection Law comprises several key articles emphasizing the protection and improvement of the environment, pollution control, and public health. It establishes the environment's broad scope, including natural and modified factors affecting human life. The law applies to the People's Republic of China and its maritime area. It highlights the importance of environmental protection as a national policy and outlines principles like prevention, public participation, and liability for damage. Units and individuals bear an obligation to protect the environment, with local governments responsible for environmental quality. Financial investment and support for environmental science and technology are encouraged. Public awareness and education are promoted, and June 5th is designated as Environment Day. Unified supervision and management of environmental protection are outlined at different levels of government. Outstanding environmental protection achievements are rewarded. It has a total of 7 chapters including 70 articles and a very comprehensive read (Chinese Government Website, 2014).

However, despite the existence of environmental protection laws and regulations, their proper implementation has been lacking due to China's prioritization of economic growth over environmental preservation. China's GDP has seen a remarkable increase, growing from less than 150 billion USD in 1978 to a nominal 17 trillion USD, making it the second-largest economy globally. In terms of purchasing power parity, it has reached 31 trillion USD, claiming the top spot in the world. To achieve its economic growth targets, China has committed to boosting automobile production, constructing nuclear power plants, and expanding coal-fired and hydroelectric power facilities.

**Table 1:** Chinese GDP and annual growth rate, 2008 to 2022; China National Bureau of Statistics (Source from: http://www.stats.gov.cn/sj/)

| Year | GDP (Trillion USD) | Growth Rate (%) |
|---|---|---|
| 2022 | 17.3 | 2.9 |
| 2021 | 16.62 | 8.1 |
| 2020 | 14.34 | 2.3 |
| 2019 | 14.34 | 6.1 |
| 2018 | 13.61 | 6.6 |
| 2017 | 12.24 | 6.9 |

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**Table 1:** Continued

| Year | GDP (Trillion USD) | Growth Rate (%) |
|---|---|---|
| 2016 | 11.18 | 6.7 |
| 2015 | 11.06 | 6.9 |
| 2014 | 10.48 | 7.3 |
| 2013 | 9.49 | 7.8 |
| 2012 | 8.51 | 7.7 |
| 2011 | 7.57 | 9.5 |
| 2010 | 6.10 | 10.6 |
| 2009 | 5.06 | 9.4 |
| 2008 | 4.60 | 9.6 |

This rapid development has led to an unprecedented construction boom, including factories, power plants, dams, reservoirs, pipelines, highways, railroads, and airports. The remarkable economic development and increased prosperity in China have undeniably been accompanied by a significant toll on the environment. This juxtaposition of progress and environmental degradation highlights the complex and multifaceted challenges facing the nation. Numerous environmentalists and experts have used the terms "environmental refugees" and "environmental disaster" when characterizing China's environmental situation, depicting it as one of the most challenging environmental landscapes in the world (Elizabeth, 2007). To the extent that a common joke among Chinese citizens including in the world is that the national bird of China is the crane, symbolizing the extensive construction. While old development patterns persist, the environment is now facing new pressures and deformations like never before (McGreevy, 2010). Throughout China's history, economic growth has frequently been achieved at the expense of environmental conservation. Even dating back to the Zhou dynasty (周朝, 1046 BC-256 BC), the third official dynasty in Chinese history, there are historical records that indicate economic development occurred at the price of extensive deforestation (Elvin, 2004). In fact, the historian Ken Pomeranz asserts that the Chinese government has been engaged in ecological stewardship for numerous centuries to boost the economy (Burke & Kenneth, 2009). Between 2010 and 2020, air pollution in several Chinese cities reached alarming levels. However, a turning point emerged during the COVID-19 lockdowns and restrictions, as well as the reduced operation of factories. These factors, coupled with government-led initiatives promoting clean energy and the adoption of electric vehicles (EVs), led to a substantial decrease in pollution levels. Nevertheless, it remains essential to maintain a vigilant stance for the future.

The average concentration of PM 2.5 particles in Chinese cities, a critical air quality indicator in 2022, still exceeded the WHO's annual air quality guideline value by a significant margin5. It was 6.1 times higher than the recommended threshold. This indicates that while progress has been made, there is a continued need for stringent monitoring and sustained efforts to improve air quality to safeguard public health and the environment.

During the period from 2010 to 2020, satellite images vividly portrayed the widespread and severe air pollution issues that plagued China. The severity of this problem posed a significant challenge to the legitimacy of the central government. Consequently, recognizing the urgent need for change, in 2014, the Chinese central government initiated a crucial shift in its environmental policies, which has undeniably yielded substantial positive outcomes (Mallapaty, 2020).

These policy revisions, driven by the imperative to address the environmental crisis, have led to noteworthy improvements in China's environmental landscape. The substantial progress made in mitigating air pollution, coupled with other environmental initiatives, has not only safeguarded the central government's credibility but also demonstrated its commitment to creating a more sustainable and healthier future for its citizens.

[5] Please see data on Air Quality in China, available at https://www.iqair.com/gb/china (Accessed on 25 October 2023).

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In September 2013, for example the capital city of Beijing introduced a five-year action plan to combat "extremely severe" air pollution, prioritizing both public health and sustainable growth. The plan included specific targets, stricter emissions standards, and transportation sector reforms.

One notable measure was a license plate lottery system for fossil fuel cars, while electric car buyers faced fewer restrictions. This initiative significantly increased the budget allocated for pollution control, from 3 billion yuan in 2013 to over 18 billion yuan in 2017. By the end of 2022, tangible progress was evident: the annual average PM2.5 concentration in Beijing had fallen by 69.2%, sulphur dioxide levels decreased by over 93% since 1998, and nitrous dioxide declined by nearly 38% (UNEP data, 2023).

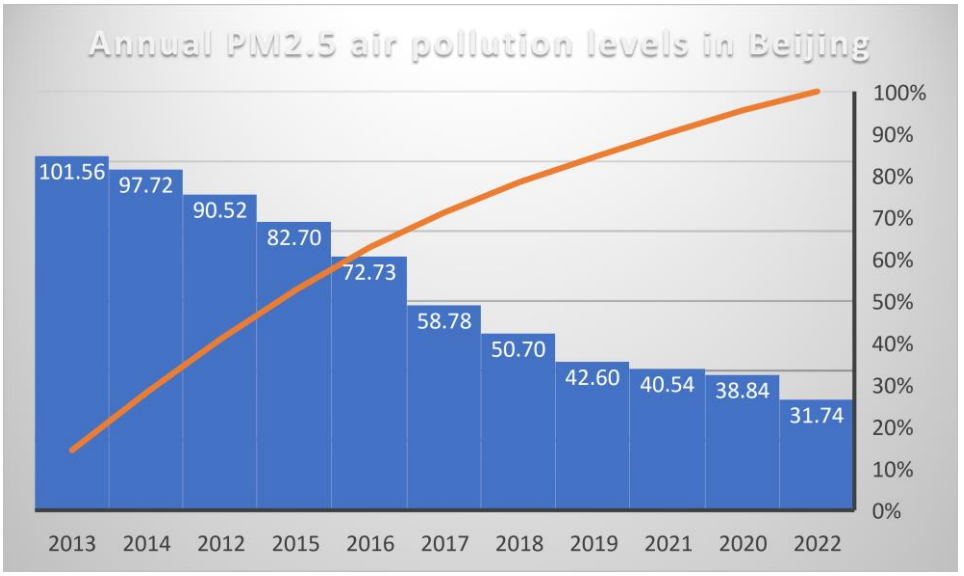


**Figure 1.** Annual PM2.5 air pollution levels in Beijing

[Source from: US Department of State; Website (www.airnow.gov)]

Foremost factors shaping this transition encompassed the rigorous implementation of emissions regulations and advanced control technologies. Initially, these standards were introduced within the power generation sector, subsequently extending to encompass steel production and other industries characterized by high emissions. A pivotal catalyst for environmental improvement lies in the progressive replacement of coal-dependent heating and cooking practices in individual households. In lieu of coal, there has been a deliberate shift towards the adoption of alternative heating sources such as district heating, natural gas, and electricity, thereby mitigating the adverse environmental impact. Furthermore, a deceleration in the trajectory of coal consumption growth since the year 2013 assumes paramount significance. This slowdown, which contrasts with the period preceding 2013 marked by a surge in coal utilization, has crucially enabled the efficacy of emissions control measures to outpace the increase in coal-burning, leading to notable environmental improvements (Myllyvirta, 2022).

While Beijing currently adheres to the national air quality standard for PM2.5 at 35 $\mu g/m^3$, this concentration level still translates to a substantial rise in the likelihood of adverse health outcomes. According to recent risk assessments, meeting this standard corresponds to an approximate 45% higher risk of lung cancer, a 40% elevated risk of stroke and adult diabetes, a 70% increased risk of ischaemic heart disease, and a twofold increase in the risk of acute lower respiratory infections (Myllyvirta, 2022).

## 3. China's Environmental Policies and Their Impact on Climate Change:

It is a well-known fact that the United States and China bear significant responsibility for the world's highest GHG emissions. Luckily, they are also at the forefront of advancements in green technology. Should these two nations find common ground and intensify their endeavours to curtail GHG emissions, the potential influence on global initiatives to maintain environmentally viable levels of global warming

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could be profound. This collaboration between these global behemoths has the power to redefine the course of our planet's climate future, ensuring a safer and more sustainable environment for everyone. In this section, let us discuss about China's environmental policies and effect on the climate change.

China is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and has approved and ratified the Paris Agreement. It falls under the category of nations, which consists of developing countries subject to less stringent obligations and entitled to assistance from the developed nations listed in of the UNFCC convention. In 2019, China accounted for over 25% of worldwide GHG emissions. China's per-capita emissions in 2019 stood at 9 tonnes of CO2 equivalent, significantly surpassing both the levels seen in the European Union (7.57 tonnes) and the global average of 6.26 tonnes (Sandalow et al., 2022). While emission levels in European countries have shown a decrease, China has experienced an increase. It is important to acknowledge that China's per capita emissions are significantly lower than those in Middle Eastern countries such as Qatar, Kuwait, Bahrain, the UAE, and Saudi Arabia, where per capita emissions can reach as high as 40 tonnes. In fact, more than 35 countries worldwide have per capita CO2 emissions higher than that of China's.

Nonetheless, given China's vast geographical expanse, addressing climate change and global warming effectively is contingent upon its highly active involvement and the implementation of well-considered measures.

The repercussions of GHG emissions, global warming, and climate change are widely acknowledged. In July 2022, the United Kingdom recorded an unprecedented temperature exceeding 40°C, an occurrence considered "extremely unlikely" without the influence of climate change. Moreover, heatwaves are not only becoming more frequent but also exhibiting longer durations and increased intensity, as exemplified by the UK, which experienced its warmest year on record in 2022.

One prevailing theory attribute these changes to elevated Arctic temperatures, which have surged at a rate more than four times the global average. This phenomenon has led to the deceleration of high-altitude winds, specifically the jet stream, thereby augmenting the prevalence of heat domes. Simultaneously, East Africa endured a sequence of five consecutive failed rainy seasons from 2020 to 2022, marking the region's most severe drought in four decades. Climate change has rendered such droughts at least 100 times more probable.

In Canada, the nation confronted its most severe wildfire season on record, with approximately 176,000 square kilometres (43.5 million acres) already consumed by flames. Similarly, Greece, Chile, and Australia experienced significant wildfires in 2023, with projections suggesting that the frequency of the most extreme fires may rise by up to 50% by 2100 (Stallard, E., & Poynting, M., 2023). The capacity of the atmosphere to retain moisture increases by approximately 7% for every 1°C rise in average temperature. This augmentation has led to catastrophic consequences, as seen in the torrential rainfall and two major dam collapses that resulted in devastating floods in northern Libya. In the summer of 2022, China itself bore witness to a record-breaking heatwave, with temperatures in various regions surging to unprecedented levels. These climatic events have collectively underscored the pressing global concern of climate change, with one meteorologist characterizing the 2022 heatwave as "the worst ever seen worldwide (Knutson et al., 2022)."

China's leadership has made a resounding declaration, emphasizing the critical and far-reaching impact of climate change on the entire human population. To address this pressing issue, they have articulated ambitious, far-reaching climate objectives. The Chinese government, recognizing the urgency of mitigating climate change, has channelled substantial financial resources into the advancement and proliferation of low-carbon technologies. This forward-looking approach underscores China's commitment to addressing the global climate crisis and its determination to play a pivotal role in shaping a sustainable and environmentally responsible future (Chinese Government, UNFCC, 2021).

In September 2020, President Xi Jinping unveiled an ambitious objective, whereby China would endeavour to attain carbon neutrality by the year 2060. The pursuit of this goal necessitates significant transformations in both China's economic landscape and energy infrastructure throughout the forthcoming decades. Over the course of the last two years, the Chinese government has introduced a multitude of policies designed to facilitate the realization of this far-reaching aspiration. It is worth

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noting that Chinese leadership has articulated a commitment to pursuing carbon neutrality in concert with other pivotal objectives, such as fostering economic growth and bolstering energy security (Ibid, 2021).

In recent years and particularly from 2013 to 2022 under Xi Jinping's rule, China's response to the challenge of climate change has exhibited a multifaceted character, reflecting both commendable progress and multifaceted concurrent challenges. This assessment can be dichotomized as follows:

China has demonstrated arguably good leadership in several crucial dimensions of sustainable energy transition. Over the past three years (2019-2022), China consistently assumed a preeminent position in various domains:

1. *Renewable Energy Prowess:* China has been at the forefront of global efforts in fostering renewable energy sources. In each of the last three years, the nation has taken a pioneering role in initiating novel projects in the domains of solar power, wind power, and hydro power. This enduring commitment has positioned China as an undisputed global leader in renewable power deployment, boasting an impressive capacity that eclipses that of any other nation, surpassing the nearest competitor by over threefold.

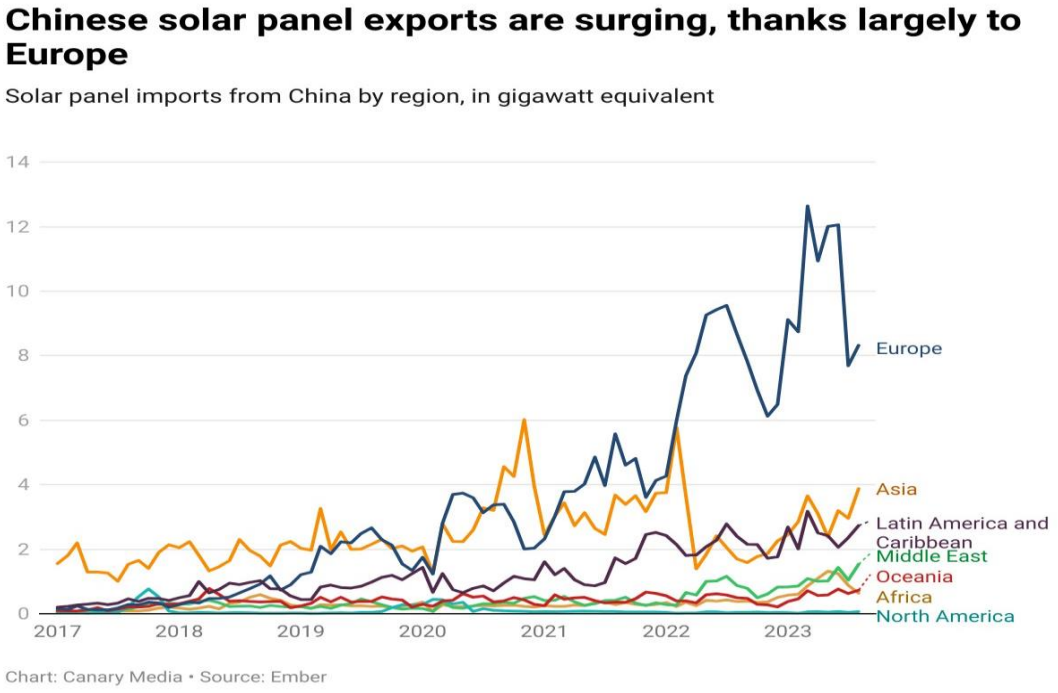


**Figure 2.** China's export of solar panel. (Source: Ember clean energy think tank, published by Wesoff, E., & Olano, M. V., 2023)

China has leapfrogged North America, Japan, and Europe many years ago in terms of solar panel manufacturing capacity, now accounting for over 80% of the world's solar production capacity. The trajectory of China's solar manufacturing industry continues to exhibit remarkable momentum, with no indication of deceleration. A notable illustration of this robust expansion is evident in the export figures for solar panels from China, which have shown a substantial increase of 34% during the initial half of 2023, as compared to the corresponding period in the preceding year. These exports have surged from 85 gigawatts to an impressive 114 gigawatts, underscoring China's unparalleled dominance in the global solar manufacturing landscape (Wesoff, E., & Olano, M. V., 2023).

2. *Electric Vehicle (EV) Dominance:* China currently possesses a significant share of the global electric vehicle (EV) battery production, amounting to 75%. It maintains a remarkable dominance in the lithium iron phosphate (LFP) technology sector, holding an unparalleled 99% market share on a global

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scale (Rafi, 2023). Moreover, even in the frontier of solid-state batteries, heralded as the forthcoming generation of battery technology, Chinese enterprises are at the forefront of research and development endeavours. A notable facet of China's environmental stewardship lies in its consistent leadership in the production and sales of electric vehicles (EVs). In each of the past three years, China has been the epicentre of the EV revolution, with approximately 45% of the world's electric cars and a staggering 95% of electric buses being manufactured and utilized within its borders.

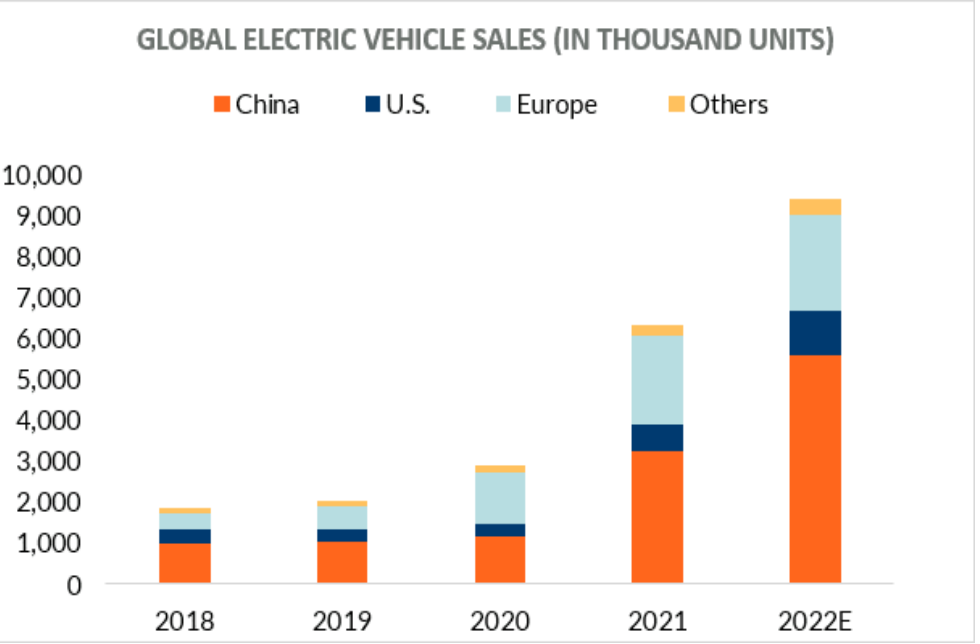


**Figure 3.** Global electric vehicle sales (Source: *CAAM, Cephei Capital*. From Rafi F., 2023*)*

The ascendancy of China as a dominant force in the global electric vehicle (EV) industry can be attributed to the proactive vision and unwavering dedication of the Chinese government to environmentally sustainable technology (You, 2023). A series of strategic policies have been diligently introduced to foster and cultivate the growth and advancement of the EV sector. These initiatives encompass not only direct financial incentives provided to automotive manufacturers but also tax exemptions afforded to consumers. The initiation of the EV subsidy program in 2009 marked the inception of a support mechanism that endured for over a decade, while tax incentives for consumers have been recently prolonged, with projections indicating an estimated value of $72 billion over the ensuing four years.

In parallel, China has demonstrated a profound commitment to the development of a resilient and expansive public EV charging infrastructure. The nation stands at the forefront of the global arena with the installation of nearly 1.8 million EV charging stations, an accomplishment that exemplifies its unmatched leadership in the realm of charging network infrastructure.

*3. Nuclear Power Advancements:* China's burgeoning interest in nuclear power is primarily driven by the pressing issue of air pollution stemming from coal-fired power plants, prompting the country to seek cleaner energy alternatives. A distinctive feature of China's nuclear policy is the commitment to establish a closed nuclear fuel cycle, reflecting the nation's dedication to efficient and sustainable nuclear energy management. While China has achieved self-sufficiency in reactor design and construction, it concurrently leverages Western technology, adeptly adapting and enhancing it to meet domestic requirements. A notable competitive advantage that China possesses, relative to the global nuclear landscape, is its robust and well-established nuclear supply chain. In line with its ambitions, China has adopted a 'go global' strategy, which includes the export of nuclear technology, encompassing heavy components within the supply chain, further cementing its position as a formidable player in the

international nuclear arena (World Nuclear Association, 2023). China's commitment to the advancement of nuclear power has been unmistakable. Over the past three years, the nation has outperformed others in the deployment of new nuclear power plants. China currently has 21 nuclear reactors in various stages of construction, collectively possessing a capacity to generate 21.61 gigawatts of electricity, as reported by the International Atomic Energy Agency (Clifford, 2023). This figure significantly surpasses the number of nuclear reactors being constructed in any other nation, by more than two and a half times. China's endeavour to bolster its nuclear energy infrastructure serves a dual purpose: firstly, it aims to fulfil a substantial and escalating energy demand. Secondly, in response to the environmental consequences of extensive coal usage in prior decades, the nation seeks to transition to a cleaner and more sustainable source of electricity, with nuclear energy offering an environmentally responsible alternative.

Nonetheless, juxtaposed with these encouraging developments, a set of concurrent and disconcerting trends has emerged, raising substantial challenges not only for China but for the global endeavour to combat climate change. These trends cast a shadow on the progress made, warranting a closer examination of the obstacles and complexities that lie ahead:

1. *Elevated Carbon Emissions:* Despite the laudable strides in renewable energy and EV adoption, China has encountered persistent challenges in curbing carbon emissions. In each of the last three years, carbon dioxide (CO2) emissions have exhibited a disconcerting upward trajectory, apart from a temporary decline in the first half of 2020 due to the COVID-19 pandemic. In 2021, China witnessed a significant increase in CO2 emissions, surging by 5-6%, constituting the most substantial annual rise in a decade. In the second quarter of 2023, China witnessed a noteworthy year-on-year surge in CO2 emissions, estimated at approximately 10%, surpassing the record levels observed in 2021 by about 1%. This increase can be attributed to two primary factors. Firstly, it is a consequence of the sharp contrast with the significant decline experienced in the second quarter of 2022, resulting once again from the widespread Covid-19 lockdowns in Shanghai and across the nation. Secondly, the ongoing decline in hydropower generation, induced by persistent droughts, has contributed to this upturn in emissions (Myllyvirta and Qi, 2023).
2. *Coal Power Expansion:* China authorized a considerably higher number of coal power plants in 2022 than in the past seven years. This translated to an approximate rate of two novel coal power plants being sanctioned each week. The study, conducted by energy data entities Global Energy Monitor and the Centre for Research on Energy and Clean Air, reveals a substantial fourfold increase in the volume of new coal power plant approvals in 2022 as compared to the preceding year, marking a significant shift in China's energy policy landscape (Simon, 2023). Simultaneously, China has sanctioned and activated substantial new coal power plant capacity in each of the past three years. In 2021, the country accounted for two-thirds of the newly added global coal power plant capacity, a development that raises questions about the alignment of such actions with the broader climate change agenda.

These dualities in China's climate change response underscores the complexity of navigating the transition to a more sustainable and low-carbon future, where impressive strides in renewable energy, electric vehicles, and nuclear power are juxtaposed with the persistent challenge of carbon emissions and coal power expansion. It necessitates a nuanced evaluation of China's multifaceted approach to addressing global climate change and underscores the importance of a comprehensive and integrated strategy in the global battle against climate change.

## 4. China's Environment Policies and Resource Management:

In its' policy document released earlier this year (2023), the Chinese government has said that they are set to expedite the adoption of nature-based solutions by integrating the sustainable utilization of natural resources into its strategy for combating climate change. This will involve optimizing the capacity of

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nature to mitigate climate impacts in various domains such as forestry, agriculture, oceans, water resources, and ecosystems. Apart from this, it also aims to enhance overall climate resilience. By 2030, China's forest coverage is projected to attain approximately 25%, with an anticipated increase of 6 billion cubic meters in forest stock volume compared to the levels recorded in 2005. Moreover, China will continue to advance the widespread optimization of clean energy resources and extend the utilization of innovative, environmentally friendly energy sources in industries like steel, cement, aviation, and shipping. This includes the adoption of electricity, hydrogen energy, natural gas, and advanced liquid biofuels.

The Paris Agreement of 2016 introduced specific constraints for all nations including China, necessitating a reduction in their carbon emissions to a minimum threshold. Furthermore, it mandates that all countries must formulate and implement policies and measures aimed at addressing the challenges posed by profound climate change (Koondhar et al., 2021).

As far as China and its' policies on resource management are concerned, the findings presented in the research studies indicate that various factors such as population (Li, Wang, and Zhan, 2021), energy consumption (Thuan and Hai, 2021), human capital (Wu et al., 2021), urbanization (Zhu et al., 2021), natural resource rent (Umar et al., 2021), research and development (Pablo-Romero et al., 2021), and trade openness (Hamdi and Hakimi, 2021) play pivotal roles in influencing GHG emissions and contributing to the rise in global temperatures which further impacts resource management. These facets collectively contribute to our understanding of the intricate web of factors influencing the complex issue of GHG emissions and the concomitant rise in global temperatures.

In the context of these issues, it is essential to comprehend the term "Natural Resource Rent" (NRR). NRR is quantifiable as the difference between the market price of a commodity and the average cost related to its production. In other words, it represents the total revenue achievable from the extraction of a natural resource, minus the expenses incurred in extracting the resource, including a standard return on investment for the extractive enterprise. NRR encompasses diverse elements, including natural gas rents, oil rents, coal rents, and mineral rents. World economies with abundant natural resources get higher development rates than countries with fewer resources and capital (Huang et al., 2020). The rise in energy consumption and the use of fossil fuels have resulted in urban areas in China contributing over 70% of carbon dioxide emissions. China's economic expansion has been accompanied by significant environmental degradation, resulting in elevated carbon emissions. In addition to this, China is recognized as one of the most susceptible countries to climate fluctuations. The most substantial drivers of environmental change in China are the industrial and energy generation sectors. Their collective emissions surged to 7,372 metric tons in 2017. China's heavy dependence on coal for energy production stands out as a major factor behind its elevated carbon emissions (Govindaraju and Tang, 2013). Environmental degradation in China has extensive repercussions, affecting multiple facets of life, including public health expenditures and GDP, as evidenced in studies (Day et al., 2019; He et al., 2019). These environmental factors significantly influence China's economic growth (Banerjee and Carrion-i-Silvestre, 2017). Given the urgency of these challenges, the solution to Green Investment (GINV), Carbon Emission Mitigation (CEM), and GDP growth lies in assuming a leadership role in technological innovation and transitioning from non-renewable to renewable energy sources. This shift towards a low-carbon economy not only addresses energy security and public health concerns but also modernizes China's industrial sector, fostering enduring economic development. Additionally, this transition aligns with global initiatives, including the Paris Agreement's aims to reduce carbon dioxide emissions by 60–65% by 2030 (UNFCC, 2016).

In the aftermath of the Paris Agreement, Chinese government has implemented regulations and restrictions on industries to safeguard the environment (Wan, et.al, 2022). Emerging economies like China have faced their share of economic challenges, making the sustenance of industrial growth a critical imperative. However, a significant dilemma arises as these nations including China grapple with the dual challenge of expanding their industries while confronting the absence of advanced technologies essential for effective commercial waste management. This predicament forces them into a tough

decision-making process, where they must weigh the benefits of organizational expansion against the pressing need for environmental protection.

In navigating this delicate balance, developing economies, like China often find themselves at a crossroads, torn between the urgency of economic development and the imperative to address environmental concerns. Striking a harmonious equilibrium between fostering industrial growth and implementing sustainable practices becomes a complex yet essential endeavour for these nations on the path to progress and it is gratifying to note that China is working towards carbon neutral industries by 2060 (Liu et al, 2022).

## 5. China's Environment Policies for Future Generations:

In the contemporary global discourse, the relationship between humanity and the environment remains a pivotal subject for nations worldwide. Firstly, environmental protection policies facilitate sustainable resource utilization. Acknowledging that resources form the foundation of societal development, these policies curb excessive exploitation and encourage conservation and recycling. Secondly, these policies reinforce the protection of ecosystems. Recognizing ecosystems as vital foundations for human survival and development, environmental protection policies establish mechanisms such as nature reserves and restrictions on destructive development, safeguarding the integrity and stability of ecosystems. Policies prohibiting or limiting deforestation in certain regions, for instance, prevent over-exploitation of forests, maintaining the balance of ecosystems. Implementation of such policies contributes to the preservation of ecosystem diversity, the maintenance of ecosystem functions, and the promotion of species proliferation and natural cycle restoration, providing robust support for social sustainable development. Thirdly, policies drive ecological improvements by strengthening monitoring, reducing emissions, and enhancing waste disposal. For example, strict industrial wastewater standards reduce water pollution, improving resource sustainability. Lastly, policies stimulate a green economy by incentivizing innovation and supporting eco-friendly industries. Subsidies for new energy attract investment, propelling the green economy and fostering high-quality economic development.

China has recognized the imperative of environmental protection and implemented the following measures.

*1. Emission Reduction:*

China spearheads emission reduction efforts, incorporating key concepts such as the "Community of Shared Future for Mankind" and five development principles. Actively engaged in global environmental governance, China fosters international cooperation.

*2. Green Development:*

China's environmental successes demonstrate the feasibility of economic and social progress without compromising the environment. Prioritizing green development ensures a harmonious integration of ecological, economic, and social dimensions.

*3. Global Responsibility:*

As an early adopter of international conventions, China plays a pivotal role in global environmental initiatives. Proposing initiatives like the "Green Silk Road" and committing to carbon neutrality, China emerges as a significant participant and leader in global ecological civilization endeavours.

Empirical findings indicate notable variations in sustainability concerns between Western and Chinese populations, specifically observed in Sheffield, UK, and Nanjing, China. Residents in the western context, particularly Sheffield, exhibit a pronounced emphasis on the social and economic dimensions of sustainable development, with relatively diminished concern for environmental degradation. Conversely, in Nanjing, China, discussions about environmental stewardship are more prevalent, situated within the overarching framework of state-led and nationalist discourses emphasizing collective responsibility (Diprose, et al, 2019).

## 6. Conclusions:

The pursuit of environmental sustainability stands as a paramount objective in enhancing the global ecological landscape. For a burgeoning nation like China, characterized by copious natural resources and elevated carbon emission levels, the imperative to address and accomplish its environmental aspirations becomes increasingly pronounced. The realization of these goals is intricately intertwined with a myriad of economic and social determinants that exert a profound influence on the trajectory of environmental sustainability within the country. As we delve into the multifaceted realm of China's environmental policies and their implications, it becomes evident that the intricate interplay of various factors necessitates a comprehensive understanding and strategic approach to navigate the path towards a more ecologically resilient future. Despite China's commendable efforts and strategic policies aiming for carbon neutrality by 2060, further proactive measures are imperative at the local government level. Notwithstanding the central government's initiatives, the effective execution of policies by several local governments remains a challenge in their pursuit of economic development. As the world's largest economy with the second-largest population, China bears substantial ethical responsibilities in addressing climate change and global warming. The profound implications of these issues on the global population underscore the urgency for China to enhance and enforce its climate-related policies at both national and local levels.

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