

# Analysis Of the Current State of Green Economy Development in China and Abroad

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**Abstract.** Since the turn of the 21st century, China's energy structure has undergone a gradual transformation, and its economy has exhibited steady growth. With the introduction of the concept of a community of human destiny and the implementation of the goal of carbon neutrality, the 'green economy' has garnered widespread attention and has been vigorously promoted. However, China's environmental problems have gained attention in recent years, and the economy requires urgent green development. As per the Paris Climate Agreement of 2015, China has committed to peaking its emissions around 2030 and achieving carbon neutrality by 2060. This is a significant strategic decision based on China's responsibility to promote the construction of a community of human destiny and the intrinsic requirement to achieve sustainable development. China's commitment to transition from carbon peak to carbon neutrality is much shorter than that of developed countries and requires hard work on China's part. This article discusses the advantages and disadvantages of China's green economy and analyses the development policies of foreign countries to promote its growth.

**Keywords:** Green economy; green finance; energy structure; green marketing.

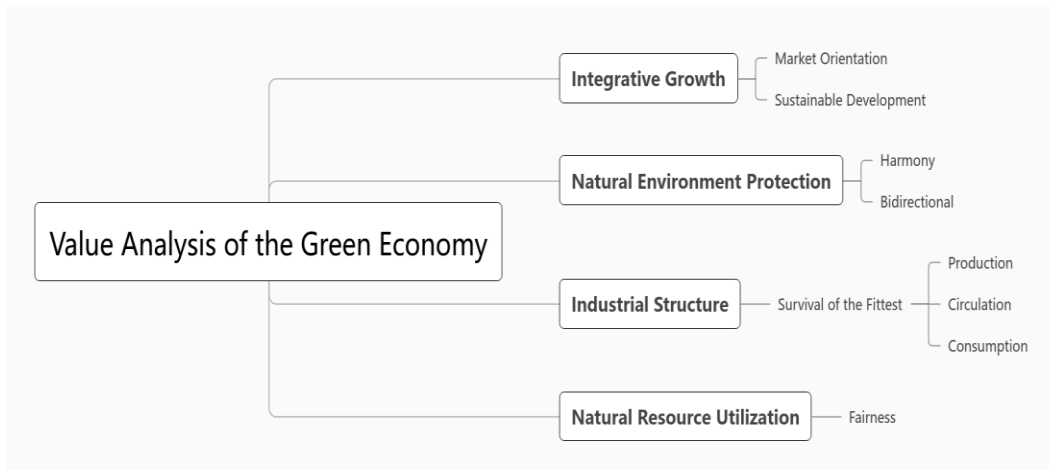
## 1. Introduction

Since the reform and opening up, China's economy has experienced rapid growth. This growth has been driven by large amounts of capital and inputs, resulting in the development of secondary and tertiary industries. However, this growth has also led to ecological and environmental problems, as the traditional crude growth model of high input, high consumption, and high emission has been maintained. In addition, global climate change is becoming increasingly severe, and biodiversity is decreasing sharply. As the second largest energy-consuming country, promoting China's economic transformation and adopting sustainable development practices are necessary steps towards a resource-saving and environmentally friendly society. China is actively implementing green development strategies and prioritizing the construction of ecological civilization. While progress has been made, there are still challenges to overcome, such as regional resource imbalances, limited innovation capacity, and weak green marketing abilities. These challenges may impede future economic development. The 2020 COVID-19 pandemic has highlighted the need for coordinated development of the economy and the ecological environment. The recovery and development process in the post-pandemic era should learn from past experiences and avoid the old approach of prioritizing development over governance [1].

By explaining the relationship between the green economy and China's economic development, summarizing the current state of China's green economy and the factors that affect it, and analyzing the significance of and challenges to the industry's development based on the trends in the green industry, we propose suggestions for the development of China's industry in four areas: green innovation, green education, green finance, and green market. These suggestions are based on the positive policies and measures taken by foreign developed countries in the development of the green economy.

## 2. Connotation of Green Economy

The Industrial Revolution brought about increased wealth and efficiency to society, but at an irreversible cost to the environment and resources. The term 'Green Economy' was coined by Pearce in his 1989 publication, 'Blueprint for a Green Economy', which criticized resource waste and environmental pollution, and proposed the development of an environmentally sustainable economy [2].



**Fig. 1** The importance of the green economy to China's economic and social development (Picture credit: Original).

As illustrated in Figure 1, the green economy contributes to our economy in four ways. Firstly, it promotes the integrated development of the economy, market, and society. Finally, it promotes the development of a green lifestyle, which is conducive to environmental protection and sustainable development. This is achieved through government-led and market-led approaches, which guide, promote, and guarantee the greening of all aspects of social and industrial activities, while reducing or eliminating pollution. Secondly, it fosters the development of green industries, creating new economic growth points and employment opportunities. Thirdly, it enhances resource efficiency and reduces resource consumption, thereby reducing production costs and improving competitiveness. The green economy system prioritizes openness and coordination, balancing environmental protection with production. It considers the cost of the natural environment and the income from production together as the basis of industrial economic accounting, confirming and demonstrating the value of the natural environment in the process of economic development. Additionally, the green economy can guide the superiority and inferiority of industrial structure. Improve the use of natural resources and reduce environmental pollution in product production, goods circulation, consumption, and utilization. Promote the transformation of industrial structure towards green practices. Ensure fair utilization of natural resources while considering the balance of environmental resources for present and future generations, and equal access to resources.

## 3. Development Status

China's green industry has rapidly developed with the support of relevant policies in recent years. Continuous technological innovation and breakthroughs have led to significant progress in battery technology, charging technology, and range in the new energy automobile industry. For instance, the Implementation Programme on Promoting the High-quality Development of New Energy in the New Era has introduced policies to promote the development of new energy automobiles, including subsidies for car purchases and tax exemption policies [3,4]. China has developed a new energy industry chain to meet the demand for integrated development. The chain includes upstream suppliers of key raw materials and core components, midstream vehicle manufacturing, and downstream charging and after-market services. Upstream suppliers provide raw materials and components, such

as lithium and cobalt, to midstream vehicle manufacturers. The downstream services include charging equipment, power exchange equipment, and battery recycling. The after-market services include auto insurance, auto leasing, and auto dismantling and recycling.

China's green credit has been continuously growing in recent years, reaching 11.95 trillion yuan by the end of 2020 and increasing to 13.03 trillion yuan in the first quarter of 2021. According to the CBIRC, this makes it the largest in the world in terms of scale. As of the end of September this year, the balance of green credit for 21 major domestic banking institutions had reached 14.08 trillion yuan, representing an increase of over 21% since the beginning of the year [5]. Currently, China's primary method of financing is through bank credit, which remains dominant. The overall volume of credit is among the highest in the world.

China is actively developing non-fossil energy sources, with a focus on large-scale wind power and photovoltaic bases in desert areas such as the Gobi. Additionally, the country is pursuing the development of solar thermal and biomass energy by local conditions. China is also accelerating the construction of a new power system that can adapt to the increasing proportion of new energy sources. China has the world's highest installed capacity of hydropower, wind power, and photovoltaic power generation, exceeding 300 million kilowatts. Additionally, China has made significant progress in reducing energy consumption and intensity, with a 26.4% reduction in gross domestic product energy consumption since 2012 and a cumulative reduction of 26.4% in energy intensity as of 2023, making it one of the fastest countries in the world in terms of energy intensity reduction [4].

#### 4. Development Challenges

China's economy has grown rapidly through a high-consumption, high-input approach to development. However, this crude growth model is difficult to sustain as environmental and resource constraints gradually limit its development. The traditional model of growth, which is characterized by high energy consumption, has not been fundamentally changed. China's contribution to scientific and technological progress is 57.5%, with a dependence on foreign technology of over 50%. In comparison, innovative countries have a contribution rate of over 70% and a dependence on foreign technology of less than 30% [6]. Therefore, there is still a gap between China's green scientific and technological innovation ability and that of developed countries.

China has a significant stock of green financial bonds and the first credit scale. However, the financing is mainly concentrated on state-owned projects, and small and medium-sized green transformation enterprises do not receive support from green credit. Problems such as inconsistent management of the green financial system, cumbersome credit processes, and limited product choices have led to blocked sales channels for green products.

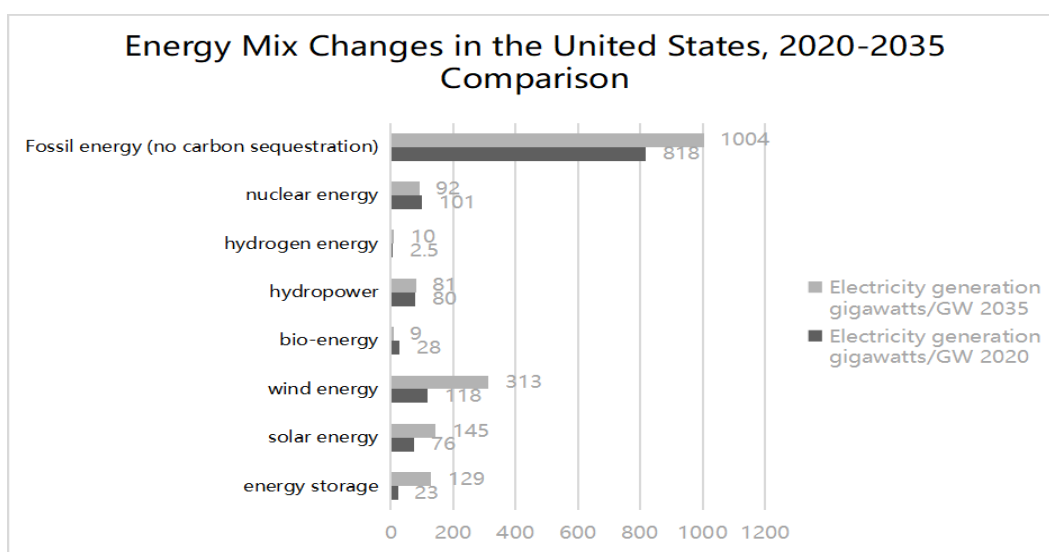
National awareness of the importance of the environment is high, but the level of implementation is relatively low. This is mainly due to economic interests, lax enforcement of relevant laws and regulations, and traditional attitudes. In terms of practical action, there is a phenomenon of high awareness but low implementation in areas such as green consumption, pollution reduction, ecological conservation, and waste sorting. To address this issue, we must enhance environmental education and increase public awareness and understanding of environmental concerns. Additionally, we should foster a sense of environmental responsibility and consciousness among individuals.

#### 5. Advanced concepts of foreign countries

The Singaporean Government is developing green finance by focusing on the synergy of finance, technology, and innovation. To enhance the ability of Singapore's financial system to withstand environmental risks and attract green investment, the government is actively building an ESG (Environmental, Social, and Governance) impact center and fostering a technology supported ESG data ecosystem through multi-party cooperation [7]. MAS coordinates the development of the green financial industry in Singapore. This includes regulating the financial services industry, promoting

the formation of green bonds, funds, loans, and other financial solutions, and developing the green financial market to finance more sustainable projects. The Global Fintech Hacker Acceleration Conference plays a key role in science and technology innovation, offering innovative solutions to support the development of green financial technology [8]. The Singapore Government aims to attract capital interest and market players by encouraging the development of green financial platforms. To achieve this, the Financial Sector Science and Technology Innovation Initiative (FSTI 3.0) will be launched in August 2023 with a planned funding of S\$150 million [9]. This programme has significantly stimulated the development of the green economy by bringing together strong intellectual resources and financial backing.

The US is at the forefront of energy reform and green jobs. To achieve complete decarbonization of the US power sector by 2035 and promote energy restructuring, the National Renewable Energy Laboratory (NREL) has conducted over 100 scenario simulations.



**Fig. 2** Comparison of changes in the energy mix modeled by the US National Renewable Energy Laboratory between 2020 and 2035 (Photo/Picture credit: Original).

The scenarios indicate that the use of fossil fuels for electricity generation will significantly decrease in the coming decades. This will lead to improved air quality and the prevention of around 130,000 premature climate-related deaths. Additionally, it is estimated that between \$390 billion and \$400 billion will be saved, which is enough to cover the cost of decarbonizing the electricity grid. These simulations predict the technical support conditions and economic returns for carbon-free power generation by 2035.

In 2020, the U.S. government introduced the Energy Act, which includes regulations on energy price protection. Maintaining reasonable energy prices is crucial for national economic growth, household spending, and business efficiency [6]. To expand financing channels, we need to broaden our approach and learn to mobilize private financing. Large-scale green projects should not only rely on public funding but also involve private capital. This will help direct capital towards low-carbon emissions. Additionally, financial market investment regulations should be strengthened to increase public participation and maintain fairness in the financing market. To promote the green labor market, community colleges in the United States are implementing green vocational education. This is based on the country's green economy, with a priority on developing a sustainable development plan for the college. This includes curriculum development, faculty professional development, and campus construction [10]. The curriculum integrates the concept of sustainable development and is designed to meet the needs of the country's green industry employers. It is multidisciplinary and interactive.

The development of a green product market relies heavily on government supervision and citizen support. The concept of green is a crucial factor in promoting green development. Citizens' green concepts determine their green consumption habits, and only a strong demand for green products can support the growth of the green industry [11]. Australia prioritizes green procurement for government

and public organizations to achieve sustainable development and reduce greenhouse gas emissions. The federal government mandates that all government organizations report their annual energy consumption to the Department of Industry, Tourism and Resources (DITR) and submit a report to the National Assembly for parliamentary and public scrutiny [12]. For instance, the city governments of Sydney and Melbourne have implemented significant changes to their office buildings. They have enforced minimum energy standards for office and electrical equipment and incorporated natural light to reduce energy consumption. Additionally, Australian government departments, universities, and other public institutions have increased their subscription to renewable energy in recent years to meet the renewable energy development target and promote green consumption.

The Australian public generally has a stronger inclination towards green consumption. Many families are willing to pay higher prices for renewable energy and products made from recycled materials due to environmental awareness [13]. This reduces carbon emissions in the consumption chain and supports the development of green industries.

## 6. Conclusion

Under the goal of achieving carbon neutrality, the green economy has gained prominence due to the dual challenges of resource conservation and economic development. China's accomplishments in the green industry have garnered global attention. Efforts have been made at the policy, market, and cooperation levels to promote high-quality development of regional green financial cooperation. However, China's green economy is still facing constraints due to traditional, inefficient, and energy-consuming development modes, an imperfect green financial system, and a low degree of green practice among the masses.

To achieve this goal, the government, market, and citizens should collaborate to implement practical energy optimization and green financial policies. It should also attract more capital and expertise into the green sector, promote standardization and large-scale development of the green industry, and encourage a low-carbon and green lifestyle to steer China's economy towards sustainability and low-carbon.

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