

# Theory and Practice of Green Finance under Carbon Neutrality Target

-- Enlightenment from the EU's Green Finance

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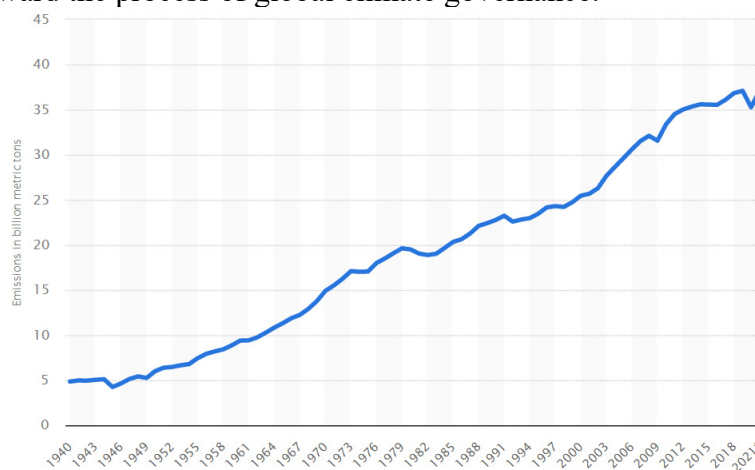
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**Abstract.** Global climate change is one of great challenges faced by international community currently. To cope with climate change and protect our Earth home on which human beings live, the countries of the world are proactively exploring development models suitable to their own national conditions, in which low carbon economy featured by low carbon emission and zero carbon emission has attracted much attention. In this background, China proposed a strategic decision of achieving peak carbon emissions before 2030 and carbon neutrality before 2060. This means China will transform from a high-carbon emission country to a low-carbon emission country, and a lot of work such as fund support, technical innovation and industrial structure adjustment should be carried out. While, green finance as a new financing way can guide capital into environmental protection and energy conservation field and promote a sustainable development, which is of important significance in advancing peak carbon dioxide emission and carbon centrality. This paper reviewed the basic concept and theoretical basis of green finance, analyzed the composition, main characteristics and operating effect of the EU's green financial system, finally summarized the EU's experience in the practice of green finance, and put forward some suggestions on relevant policies according to the actual situation of China.

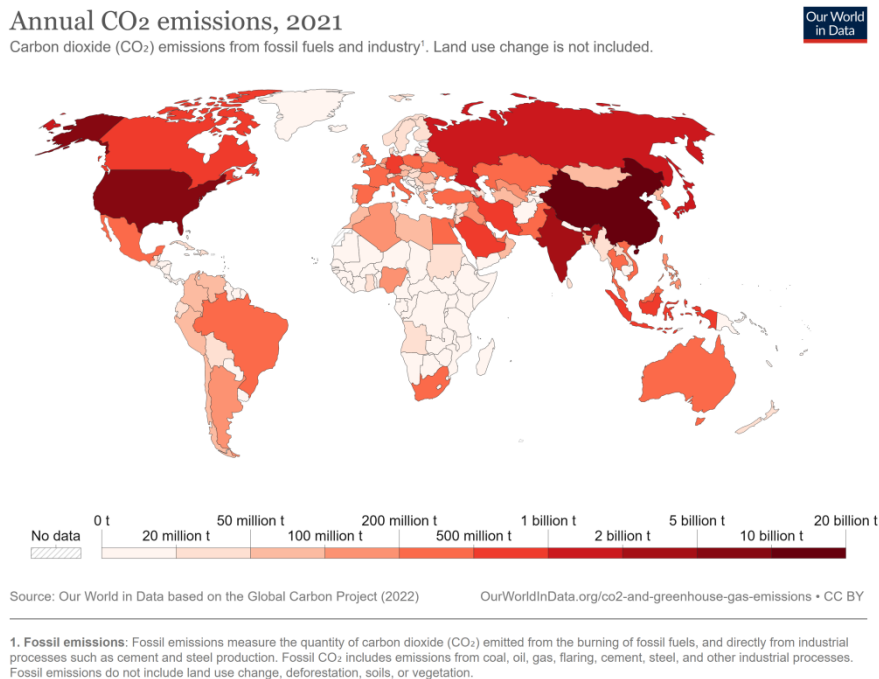
**Keywords:** Carbon Centrality; Green Finance; European Union; Enlightenment.

## 1. Introduction

Environmental pollution and climate disaster caused by industrial civilization makes the world to take a new look on the development relationship of human and the nature, and the countries around the world begin to realize the importance of environmental protection and sustainable development issues (As shown in figure 1-2). In this background, the United Nations proposed the Paris Agreement in 2015, aiming to limit greenhouse gas emissions so as to solve global warming and environmental pollution problems. This Agreement requires developed countries to adopt effective measure to reduce their carbon emissions, and included it in the mandatory emission reduction plan specified in its Kyoto Protocol. Meanwhile, other countries are encouraged to take an active part in helping developing countries to lower carbon intensity through financial and technical assistance, so that they can jointly push forward the process of global climate governance.



**Figure 1.** Annual carbon dioxide emissions worldwide from 1940 to 2021 [1]  
(in billion metric tons)



**Figure 2.** Annual CO<sub>2</sub>emissions, 2021 [2]

In response to the international community’s concern to environmental issues and to meet the need of economic transition and upgrading, the European Union(EU) has issued a series of policy documents, making affirmative disclosure to push for carbon neutrality, which include establishing the Carbon Border Adjustment Mechanism(CBAM), formulating relevant laws and regulations, building unified supervision system, and so on. These policies and measures can not only facilitate industrial structure adjustment and energy transition within Europe, but also drive the economy of surround region and even the whole Europe to grow. This paper focuses on relevant practices that EU develops and shapes its competitive advantages in green finance, with a hope of getting some experience and enlightenment to promote the development of green finance in China.

**Table 1.** Carbon neutrality target attainment time for major emitting countries [3]

Country/Region	Target time for carbon neutrality	Country/Region	Target time for carbon neutrality
Finland	2035	Japan	2050
Austria	2040	Korea	2050
Iceland	2040	Fiji	2050
Sweden	2045	Denmark	2050
USA	2050	Hungary	2050
Canada	2050	Ireland	2050
UN	2050	New Zealand	2050
UK	2050	Portugal	2050
France	2050	South Africa	2050
German	2045	Switzerland	2050
Chile	2050	Spain	2050
Costa Rica	2050	China	2060

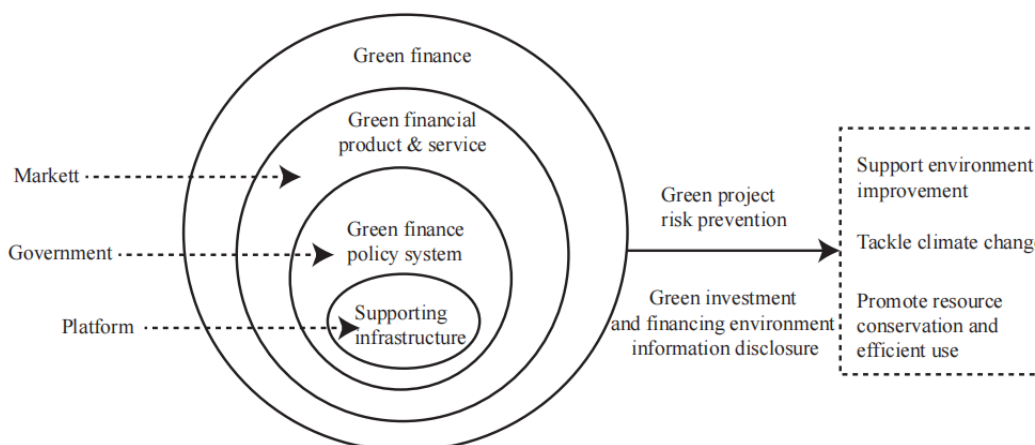
## 2. Basic Concept and Practice Model of Green Finance

### 2.1 Concept of Green Finance

Green finance first originated from Europe in the 20<sup>th</sup> century. It is a new financial model created by developed countries on basis of traditional finance combined with an idea of low carbon and

environmental protection in order to solve the environmental problems caused by industrial development. According to Wang and Zhi(2016), green finance is a new financial model integrating environmental protection and economic benefit. It refers to the financial activities such as credit, insurance, securities and industry funds carried forward to promote economy, resource and environment to develop in a harmonious way. On one hand, it could help finance industry to achieve green development; on the other hand, it can provide financial support to green industrial development through financial tools and financial innovation.

In 2016, G20 Green Finance Synthesis Report defined “green finance is the investing and financing activities that can produce environmental benefit to support sustainable development”. [4] According to the definition of International Finance Corporation in 2017, green finance is “the investing and financing activities to provide environmental benefit”. [5] Though there is no uniform concept of green finance in academic circle and practice field, it can be confirmed that the development core of green finance is to tackle climate change, support environmental protection and increase resource utilization rate. Its supporting toWol includes green credit, green securities, green funds, green insurance and carbon finance, with double features of market-based environmental regulation and financial service model.



**Figure 3.** The schematic of green finance

## 2.2 Practice Model of Green Finance

Internationally, there are three different types of green finance practice models: the first is “Green Point” Plan represented by Germany. This plan is an environmental fund established and co-funded by government, enterprises and social communities, designed to promote the financing of sustainable development programs. The second is “Brown” bond represented by the UK. Such bond is normally used to fund environmental protection projects in public or private field, and its interest income can be used to repay the debt principal. The third is “Blue” bond represented by the US. The capital raised by blue bond is dedicated for supporting the investment in high growth industry such as clean energy, and it is also invested in projects with strong pollution but economic value. In addition, some countries such as Australia and Japan have adopted various forms of green financial tools to expedite environmental protection and sustainable development. [6]

In China’s case, it has already formed a green financial market system covering complete financial business forms such as bank, securities, insurance, fund and futures. Among them, bank industry as the major strength actively participates in each link of green industry chain through credit, financial management, leasing and so on; securities industry gives full play to the function of capital market, increasing support to emerging industries like energy saving and emission reduction, new energy vehicles and so on; insurance industry releases their products such as environmental pollution liability insurance and climate insurance to enhance the ability of enterprises to cope with climate change risk; fund industry is constantly innovating on fund varieties of green theme, encouraging more institutions to join in the green investment team; and futures companies use their own advantage to carry out commodity option trading business to service the developing need of real economy. Furthermore,

many non-banking institutions also start to set foot in green finance field, such as asset management company, pension security company, etc.

**Table 2.** Comparison of green finance practices

Type	Internal practices	China's practices
Policy idea	Taking marketing as principle, the practices are spontaneously formulated by financial institutions themselves. They use market mechanism as a link and are advanced via interest transmission between market entities.	Guided by government and taking government sectors as main body, the practices vigorously advocate and collaboratively propel green finance, effectively release active policy signal, guide green finance practice to implement orderly, and drive green finance market to develop well.
Project review method	Have a low requirement on pre-implementation project approval, pay more attention to review of project operation process.	Green finance related policies attach equal importance to pre-implementation approval and regulation in the process.
Project screening standard	Project range specified in the guiding principle is wide. For example, only the amount of financing is specified in the projects able to provide green credit, but there is no limits to the industry of such projects.	Green finance policies clearly limit the scope of projects in the fields of environmental protection, green energy saving, etc.
Project supervision subject	The management in project operation process mainly relies on the third party organization.	Mainly managed by financial institutions and monitored by government sectors.

### 3. Overview of the EU's Green Finance Development

#### 3.1 Development Situation of the EU's Green Finance

The Europe Union is one of the largest economies in the world and one of the most vigorous and innovative region in the globe. Since 2005 when the European Council raised the "Sustainable Financial Policy", the EU has been committed to promoting a low-carbon and environmentally friendly transformation of financial industry [7]. At present, the EU has established a relatively perfect green finance system covering green credit, green bonds, green stock index and other financial tools as well as relevant laws and regulations and supervision framework. At the same time, governments and enterprises are also actively responding to and taking part in green financial market, which promotes the research, development, application and extension of green technologies and accelerates energy structure adjustment and industrial upgrading process. According to statistic data, by the end of 2020, more than nine trillion euros of assets in the EU involve environmental risk or are related to environmental protection, about 37% of which are invested in green projects. It is fair to say that the development level of green finance in the EU is among the top in the world.

#### 3.2 Characteristics of the EU's Green Finance Practices

##### 3.2.1 Establish a Perfect Policy Framework System

In promoting green finance, the EU has formed a complete policy framework system, including laws and regulations, guiding opinions, relevant standards and so on. For example, in May 2019, the European Parliament adopted the European Climate Law, aiming to provide European countries with a common but differentiated carbon emission reduction scheme; meanwhile, the European Commission has also published a number of guiding opinions and action plans on supporting sustainable investment and financing. Moreover, the EU has introduced a series of certification systems for green bond issuers, ensuring that they conform with environmental information disclosure requirements and fulfil their social responsibilities. These policies, laws and regulations enacted are

not only conducive to standardizing market order, enhancing market transparency, but also help to promote cooperation between member states, and realize collaborative governance on a global scale.

### **3.2.2 Set up Special Agency to Push Forward the Work**

To further strengthen supervision over green finance, the EU has set up two separate units: the European Banking Authority (EBA) and the European Securities and Markets Authority (ESMA) [8], which take charge in credit rating and securities classification management, respectively. This “double-column” supervision architecture guarantees overall economy in the EU to run stably, effectively prevents risks, and raises supervision efficiency. Besides, the EU also encourages private banks, asset management company and other professional institutions to participate in green financial business, constantly enrich product categories, and boarder the source and channel of capital.

### **3.2.3 Give Play to Intermediary Role**

As a bridge to connect enterprise and capital market, the EU has been devoting to building an efficient and convenient investment and financing platform and promoting communication and cooperation among all parties. Now, the EU has owned a number of regional stock exchanges and securities exchanges, such as the London Stock Exchange and the Amsterdam Stock Exchange, which facilitates the direct financing of enterprises. The EU also cultivates all kinds of intermediary service organizations, such as green consultation center, environmental assessment agency and so on, to provide a full range of environmental protection consultation and assessment service. [9]

### **3.2.4 Strengthen International Cooperation and Promote Green Concept**

With increasingly obvious climate change problems, the EU begins to turn to international cooperation and look for more resource input and technical assistance. In recent years, the EU has invited experts and scholars from other countries and regions to study in many occasions, share experience and lessons, and promote green finance concept. In the meantime, the EU actively cooperates with other international organizations to jointly cope with the challenge of global climate change.

## **4. Enlightenment from the EU’s Green Finance Practice to China**

### **4.1 Dominated by Government**

In the process of carrying forward green transition, the EU pays much attention to giving full play to the role of market mechanism. This model is worth learning from. When we drive economy to develop in high quality, and achieve the target of peak carbon emissions and carbon neutrality, we need to mobilize the enthusiasm of all parties to make joint efforts. Specifically, it is necessary to set up a trans-department and trans-field leading group of high-level experts on green finance, guiding financial institutions to develop green finance. Currently, China pays high attention to the development of green finance, and financial institutions in the interbank market also actively set up green financial department, implement green development idea, and service green economy. But in general, the decisions of financial institutions in the interbank market on green finance are still limited within their own institution, lacking of coordinated guidance by trans-institution and trans-field green expert group. Based on this, it is feasible to learn from the practice of the EU. The supervisory authorities of interbank market can lead to organize and build high-level leading group of experts on green finance, invite the representatives of institutions in interbank market and experts in ecological environment to participate in, strengthen high-level coordination, unify and coordinate the opinions of various agencies and fields, to facilitate the harmonious development of green finance in interbank market.

### **4.2 Participation of Enterprises**

In European market, more and more banks begin to include environmental factors in their loan pricing model. This means enterprises should burden more cost for their behavior. Therefore,

enterprises shall actively explore a sustainable path of development, enhance their sense of social responsibility, and take measures to reduce environmental pollution. Beside of this, the government could encourage enterprises to use low-carbon technologies or products through tax and financial subsidy, to minimize negative effect resulted from production. These policies can not only stimulate economic growth but also help to achieve carbon neutrality target.

Besides bank, insurance company also plays an important role. As people's awareness of environmental protection is enhanced continuously and the risks posed by climate change are becoming evident, insurance company is expected to become one of the main strength to drive green transition. For example, Holland's climate insurance system requires all enterprises to buy a certain amount of climate insurance, to remedy the loss due to weather. Thus, in the event of extreme weather, enterprises won't go bankrupt because of being unable to assume compensation liability. In addition, insurance company can provide relevant consultation service, helping enterprises to set up more reasonable environmental protection strategies.

### 4.3 Market Operation

Establishing a unified, transparent and predictable trading platform is a key means to achieve the target of carbon neutrality. At present, China has established a nationwide carbon emission permit exchange, but there are still some problems in local areas such as regional segmentation and information opacity. So, we should further improve related laws, regulations and policies and promote their implementation, and reinforce supervision to ensure a proper operation of market as well. Besides, we can consider to introduce advanced experience in the world, such as the Environment Credit system developed by ETS company of America and the Blue Hydrogen released by Holland Bank, hoping to improve the efficiency and liquidity of carbon trading market in China. Finally, the target of carbon neutrality can't be accomplished in an action, so a long-term continuous input is a necessity. This provides longer financing cycle and higher risk premium and requires us to be patient enough to support enterprises in transformation and upgrading.

### 4.4 Social Supervision

In the EU, enterprises have to disclose environmental information and accept independent audit. Such kind of mandatory requirement is beneficial for investors to make scientific decision and for supervision departments to discover problems timely and take measures to correct them. In 2004, the United Nations Environment Programme initiated the "ESG information". It refers to non-financial disclosures made by enterprises on Environment, Social Responsibility and Corporate Governance, and its content may cover climate risk, pollutant emission, employee rights and interests, consumer rights and interests, executive compensation, anti-corruption, and so on. Nowadays, the scope of "green finance" is not limited to environmental protection, but a resource allocation tool that drives sustainable development target. A sustainable investment shall be investment behavior that can retrospect environmental responsibility and social responsibility. More and more investors have began "sustainable responsible investments", which pursue investing return and meanwhile have requirements on non-financial aspects such as environmental protection and social responsibility. Regarding green financial information disclosure, there are some problems in Chinese market, such as insufficient willingness of enterprises to disclose information, lack of accurate and comparable information, too obscure qualitative description, short of reference willingness of investors, and so on. Only by clearly detailing supervision terms and providing enterprises and investors with clear requirements and rewards and punishment expectation, the enterprises can efficiently reflect relevant information to stakeholders, and investors and the public can make effective supervision on corporate behavior. Hence, accelerating the improvement of green financial information disclosure system is crucial to activate green investment.

## 5. Conclusion

Peak carbon emissions and carbon neutrality is a wide and profound economic and social systematic reform. In the process of realizing this reform, we have to give full play to market mechanism, and motivate the enthusiasm of all subjects, making the whole society to jointly advance carbon emission reduction. In future, China should further deepen reform and opening up, expedite the construction of a new development pattern that domestic cycle is taken as principal and mutually reinforced with international cycle, pay attention to boost technical innovation capability, and constantly strengthen the autonomous and controllable ability of industrial and supply chains, so as to make contribution in coping with climate change to the whole nation and even the world.

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