

EU Unilateral Action on Carbon Emission Control for Shipping Industry and China's Response

Sun Yue

Shanghai Maritime University, sunyue84@163.com

Abstract : According to the development of international situation and unilateral actions of European Union (hereinafter referred to as “EU”) shipping industry, it is imperative for China to promote ecological civilization construction and low-carbon economic transformation. Judging from the EU’s actions, the EU and China have disagreement on the basic principles of carbon emission reduction. And the EU’s actual actions have demonstrated a deviation from the “common but differentiated responsibilities principle”. The EU’s actual actions place China to commit more responsibilities than the UNFCCC and the Kyoto Protocol regulated. China shall, under the guidance of the “common but differentiated responsibilities principle”, through the establishment of a carbon emission reduction system, the legislation of carbon neutralization and the selection of a voluntary agreement and other routes, respond to and figure out the possible impact of the EU unilateral actions on carbon emission control in shipping industry.

Key word: Carbon Emissions; EU Carbon Regulation in shipping industry; Unilateral Action; Carbon Neutralization

Introduction:

April 16th 2021, President Xi held an online summit with French President Emmanuel Macron and German Chancellor Angela Merkel. The important conversation between China and the two major European powers has attracted worldwide attention. At the online summit, the leaders of the three countries agreed to uphold multilateralism, fully implement the Paris Agreement, and work together to build a fair, equitable and win-win global climate governance system. The three leaders emphasized the need to strengthen conversation on climate policy and cooperation in the field of green development so as to make an important pillar of

China-EU cooperation via the response to climate change. China will strive to peak CO₂ emissions by 2030 and reach carbon neutrality by 2060. The promotion of ecological civilization, reform of industrial structure and construction of legal system are the important ways to achieve carbon neutrality in China.^①

The EU has been very active in the area of carbon emissions reduction.^② And it has stated that the EU will take unilateral action if IMO (International Maritime Organization) does not make a real breakthrough on carbon emission reduction of shipping industry. Unilateral action by the EU would greatly undermine the authority of the IMO and increase the burden on international shipping industry in EU waters. So far, the EU has not taken unilateral action, but the EU's action on carbon emission reduction in shipping industry is gradually advancing.^③ Because of the enormous pressure of Green House Gas(GHG) emissions from maritime transport, it is very likely that the EU will unilaterally incorporate international maritime transport into its carbon trading system in order to achieve the GHG emission reduction targets.^④ Once the EU takes unilateral action, the process of carbon peaks and carbon neutralization in China's shipping industry may accelerate. This forces China's shipping enterprises to transfer

^① https://www.ndrc.gov.cn/fzggw/wld/sw/liddt/202012/t20201211_1252660.html.

^② As early as 2003, the European Union established an emissions trading system within its member states through Directive 2003/87/EC (which finally came into force in 2005). The directive so far applies only to the industrial sector and does not cover the shipping industry. But it should be noted that proposals to include shipping in the EU's emissions trading scheme are not new. In 2008, the European Union adopted Directive 2008/101/EC, which included aviation in the EU Emissions Trading Scheme. From 2012, all flights to or from any EU airport will have to buy carbon allowances. Aircraft operators who fail to hand in sufficient quotas could be fined, their aircraft detained or even embargoed. The consensus is that the shipping industry, which has a similar nature to aviation, could be included in the EU emissions trading scheme through a similar process.

^③ There are two main reasons why the EU has yet to act. The first is that, despite strong resistance from developing countries within the IMO, the EU still holds out hope for binding international legal norms on shipping mitigation that are consistent with its goals. The second is that the EU has not yet fully persuaded Malta, Greece, Cyprus and other shipping powers within the EU. The EU is still assessing the damage that unilateral action might cause to member states.

^④ Bin Hu. International law analysis of carbon emission trading scheme in EU maritime transport. [M] China Social Sciences Press, 2017.p5.

m technology, of course, will also increase costs. Meanwhile, in response to the unilateral action of the EU, China urgently needs to return to the framework of the international law, take the “common but differentiated responsibilities principle” as the guiding principle, aim at fairness and justice under the international law, and respond by means of domestic carbon emission reduction legislation and market regulation.

Through the analysis of the international conventions and IMO’s requirements on carbon emissions in shipping industry, this paper focuses on the EU’s intention to take unilateral actions in shipping emission reduction. Because of the characteristics of globalization of shipping industry, once the EU takes actions, it will have a certain impact on China’s shipping industry. Specific impact is shown as the illegality of international law of EU unilateral action, infringing on the interests of developing countries. Combined with China’s own characteristics, the specific ways to deal with the unilateral action should be proposed as soon as possible. Low-carbon development is a systematic issue involving economic industry, social life, environment, energy and many other aspects. Decentralized legislation will lead to conflicts between laws, thus weakening the practical effect of legislation. Therefore, it is necessary to have a comprehensive legislation to govern the principle, system, mechanism and comprehensive system of low-carbon development.

Why EU Intend to Take Unilateral Action in Carbon Emission Control for the Shipping Industry?

The Origin of Carbon Emission Problem in Shipping Industry

The *United Nations Framework Convention on Climate Change* (hereinafter referred to as “UNFCCC”) is the most influential, wide-ranging and far-reaching international legal instrument in the field of international environment and

development so far.^① The UNFCCC divides countries into two groups: Annex I countries are the industrialized countries that bear the greatest historical responsibility for climate change; non-Annex I countries are mainly developing countries. To achieve the objectives of the UNFCCC, the *Kyoto Protocol* (hereinafter referred to as “Protocol”) came into force in 2005, making it the first legally binding climate agreement. The signing of the Protocol officially opened the global carbon trading scene to grow rapidly.^② The *Paris Agreement*, which follows by nearly 200 UNFCCC Parties, is the second legally binding climate agreement that sets out arrangements for post-2020 global action on climate change.^③ The UNFCCC, Protocol and Paris Agreement, all based on the “common but differentiated responsibilities principles”, require Annex 1 countries to act first and assume greater responsibility for global climate change, rather than imposing mandatory requirements on non-Annex 1 countries.

IMO has been concerned about the environment for a long time, from 69CLC, 96HNS and 2001BUNKER, its legislative model and concept have the same significance to the relief of climate change. In recent years, IMO’s attention to the environmental issues of shipping industry has been inclined to the issue of GHG emission. The IMO’s requirements for reducing GHG from ships are shown in the table below.^④

^① Rui-jiao Zhang. China's response to the global green carbon game: a study on the construction of China's carbon trading market mechanism and carbon inventory system [D], 2013.p34.

^② Teall Crossen. The Kyoto Protocol Compliance Regime: Origins, Outcomes and the Amendment Dilemma[J]. Resource Management Journal, 2004, 1:3.

^③ As required, the Paris Agreement will enter into force 30 days after the date of deposit of the instruments of ratification, acceptance, approval or accession by at least 55 Parties to the United Nations Framework Convention on Climate Change (UNFCCC), which account for at least 55 per cent of global greenhouse gas emissions. On 4 November 2016, the plenary session of the European Parliament voted overwhelmingly in favour of the EU's ratification of the Paris Agreement, which was adopted by the European Council later in the day through a written procedure. This means that the Paris Agreement has met the necessary conditions for its formal entry into force. On November 4, 2020, the United States has officially withdrawn from the Paris Agreement; On Nov. 30 of that year, Biden was reported discussing a return to the Paris Agreement with administration officials.

^④ See <https://www.imo.org/en/OurWork/Environment/Pages/GHG-Emissions.aspx>.

Date(Y)	GHG Emission Requirements
1997	"Carbon Dioxide Emission from the Ship" Resolution established and authorizes the IMO to control GHG emissions.
2003	IMO entitled to policy and Implement shipping GHG Emission reduction.
2013	<p>New regulatory tools to improve energy efficiency of international ships:</p> <p>A. Strict carbon intensity standards are imposed on new types of ships – the Mandatory Design Requirement (EEDI).</p> <p>B. For all ships – the Mandatory Ship Energy Efficiency Management Program (SEEMP) to improve ship energy efficiency.</p>
2015	EEDI Phase 1: Reduce ship carbon intensity by 10%.
2016	Compulsory IMO data collection system: As from January 1, 2019, any vessel above 5,000 gross tonnage (accounting for more than 85% of international shipping emissions) is required to collect fuel consumption data and submit annual reports to the IMO.
2018	IMO entitled to formulate strategy for reducing GHG Emissions from ships.
2019	Adopt a procedure to assess the impact of alternative measures on countries. Strengthen EEDI requirements for some ship types. Resolution on port and shipping cooperation. Establish the "GHG Technical Cooperation Trust" within the IMO.
2020	EEDI Phase 2: Reduce the carbon intensity of ships by 20%.

2025	EEDI Phase III: Reduce the carbon intensity of ships by 30%. Several types of ships are premature (2022), with the largest container ships reducing carbon intensity by up to 50%.
2023-2030	Medium term action: Reduce fleet carbon intensity by at least 40%.
2030-2050	Long-term action: Reduce the carbon intensity of the fleet by at least 70%.
2050	Reduce the total Greenhouse Gas (GHG) emissions by at least 50% per year (requiring the reduction of carbon dioxide by approximately 85% for each vessel) and achieve carbon neutrality by the earliest possible means of this century.

According to the latest IMO reports, total shipping emissions increased from 977 million tons in 2012 to 1.076 million tons in 2018 (an increase of 9.6%).^① However, the carbon emissions target will be 962 million tons in 2012, and 1.056 billion tons in 2018 (an increase of 9.3%).^{②③} The 2020 IMO GHG Reductions Report identifies the four indicators of carbon intensity, namely operating energy efficiency indicator (EEOI, gCO₂/t/nm), AER, gCO₂/dwt/nm, DIST (kg CO₂/nm) and TIME (tCO₂/h).^④ These metrics can be calculated using data from the data collection system or included in the SEEMP guide.^⑤ It can be seen that the international community has already put forward specific targets on carbon emission reduction. As an Annex I country and a large shipping country, the EU is a party to the Convention and a major

^① *IMO GHH study 2020.*
<https://www.imo.org/en/OurWork/Environment/Pages/GHG-Emissions.aspx>.

^② *IMO GHH study 2020.*
<https://www.imo.org/en/OurWork/Environment/Pages/GHG-Emissions.aspx>.

^③ Total greenhouse gas emissions from shipping (international, domestic and fishery) include: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).

^④ *IMO GHH study 2020.*
<https://www.imo.org/en/OurWork/Environment/Pages/GHG-Emissions.aspx>.

^⑤ *IMO GHH study 2020.*
<https://www.imo.org/en/OurWork/Environment/Pages/GHG-Emissions.aspx>.

member of the IMO.

A Review of Carbon Emission Regulation in EU Shipping Industry

Refers to EU maritime emission reduction policy development and legislation. On the one hand, the EU has tried to incorporate the maritime emissions into the framework of the EU GHG emission policy. On the other hand, the EU has already started to prepare for the construction of ETS of shipping industry, mainly for the implementation of MRV mechanism.^①

EU MRV

In June 2013, the European Commission issued a draft regulation on “monitoring, reporting and verifying” GHG emissions from shipping (“EU MRV”), which entered into force on 1 July 2015, and commencing its first reporting cycle on 1 January 2018. This indicates that the EU MRV has completed all legislative procedures, officially become one of the EU laws.^② Although the first annual monitoring period of the EU MRV is 2018, this measure will cause an uncertain and evolving regulatory environment throughout the 18-year period.^③

The EU MRV is likely to propose regional standards in two areas: firstly, by producing data on GHG emissions from ships docked at EU ports, which will compensate for the lack of transparency. Secondly, the data will be available not only to those who buy shipping services, but also to regulators and NGOs.^④ The EU is ready to further update its local standards based on data collection and management. Due to the EU’s certain potential in the area of resource regulation, the presentation of the EU regional standards and the formulation of IMO laws and regulations will form an iterative way of interaction. Thus, there is a potential for a “hybrid” governance venue in terms of reducing GHG emissions from maritime transport, where regional

^① Bin Hu. International law analysis of carbon emission trading scheme in EU maritime transport. [M] China Social Sciences Press, 2017.p34.

^② Jian Zhou. EU MRV Regulation Interpretation and Countermeasures Suggestions [J]. China Cosco Shipping, 2017. p7.

^③ EU-MRV (n 4).

^④ <https://www.emissions-euets.com/monitoring-and-reporting-regulation>.

governance and IMO governance interact.^① In the process of governance, the role of law in solving these problems is evaluated, which makes it an effective way of governance in “mixed” governance.^② EU MRV is not only an important condition for the establishment of EU regional marine emission reduction market mechanism or other marine energy efficiency standards, but also a large amount of data for the establishment of a global marine emission reduction market mechanism in the framework of IMO. Presumably, the EU MRV provides a catalyst for the establishment of a global data collection system on GHG emissions from shipping, and puts pressure on the IMO to promote substantive international legal progress on carbon emission reductions.^③ In the past and in the future, the EU has been and will be the dominant player in the IMO's development of emissions reduction policies.

EU ETS

The IMO negotiations have been deadlocked, failing to agree on global action to reduce carbon emissions from shipping.^④ Environmental NGOs have repeatedly called on the EU to develop an instrument to reduce carbon emissions from shipping. According to the requirements of the Protocol, the EU is under great pressure to reduce carbon emissions. Therefore, its member states are actively building the legal system after the signature of the Protocol. Directive 2008/101/EC (hereinafter referred to as “EU ETS”) is the EU’s early law to deal with climate change, which has continuously brought the GHG emission industry into its jurisdiction. The most controversial one is the aviation industry ETS Directive. With the great pressure to

^① The term hybrid governance can be used to describe different phenomena. Levi-Faur includes different concepts within this broad category including co-regulation, enforced self-regulation, meta-regulation and multi-level regulation. We are using the term to refer mainly to meta-regulation but it also captures the multi-level elements as between the EU and the IMO.

See David Levi-Faur, 'Regulation and Regulatory Governance' in David Levi-Faur (eds), *Handbook on the Politics of Regulation* (Edward Elgar 2011).

^② Scott J, Smith T, Rehmatulla N, et al. The Promise and Limits of Private Standards to Reduce Greenhouse Gas Emissions from Shipping[J]. *Journal of Environmental Law*, 2017, 29(2): p. 231-262.

^③ COM (2013) 479, ‘Integrating maritime transport emissions in the EU's greenhouse gas reduction policies’ 5.

^④ Smets I. NGOs: EU should prepare inclusion of shipping in ETS[J]. *Euro politics environment*, 2011(810): p.5.

reduce carbon emission, EU efforts to incorporate the shipping industry in EU ETS to meet the requirement of GHG emissions reduction of the Protocol. According to a recent study, shipping accounts for 3.5% of global emissions, and EU ETS is presumed to be a powerful and effective tool for reducing shipping carbon emissions. The report was certified by an independent, government-certified enterprise.^{①②} EU ETS is the cornerstone of the European Union's efforts to meet its obligations under the Protocol. It covers over 11,500 energy-intensive facilities in 25 EU member states and covers entities emitting approximately 45% of the emission reduction targets which represent approximately 20% of total EU GHG emissions.^③

At first glance, ETS appears to be an effective tool for the European Union to allocate carbon credits and thereby achieve carbon reductions. It provides a range of estimated quotas available over the five-year implementation period of the Protocol. These quotas are shared with other countries, and countries such as Japan and Canada may decide to include emissions trading and receive them. However, the totals indicate that the supply of quotas will be sufficient under other conditions being the same.^④ Therefore, the role of ETS in quota allocation is questionable. In addition, industry has long feared a patchwork of regional regulations that would interfere with industry's carbon emissions reductions.

As for the scope of EU ETS applicable to the shipping industry, there are four plans: one is applicable to the discharge of ships within the territorial sea of the EU; the other is applicable to the discharge of ships within the voyage between EU ports; the third is applicable to the discharge of ships within the whole voyage into and out

^① PARIS & LONDON, 1ST JULY, 2015: Verifavia, the world's leading emissions verification company for the transport sector, today unveiled its dedicated shipping service to coincide with the coming into force of the European Commission's (EC) Monitoring, Reporting and Verification (MRV) rules to collect emissions data. The verification includes whether the contents of the report violate the monitoring plan, whether there is any false statement, etc.

^② For example, under the EU aviation carbon emission control, airline operators who fail to purchase quota over the quota will be fined. In the most serious cases, they may even be subject to an "operational injunction" issued by the EU, in which penalised operators can argue for relief from the European Commission.

^③ <http://europa.eu.int/scadplus/leg/en/lvb/l28012.htm>.

^④ Parker L. Climate Change: The European Union's Emissions Trading System (EU-ETS) [C]// Congressional Research Service Reports. Congressional Research Service, Library of Congress, 2006.

of the EU; and the fourth is applicable to the goods imported or exported from the EU from the ports of departure.^① Although the EU has so far not included international shipping in its emissions-trading scheme, EU MRV has provided ample data support for the promotion of EU ETS.^②

To sum up, both EU MRV and EU ETS emerged against the backdrop of IMO's regulatory inertia and the exclusion of international shipping from the Paris climate-change agreement. They are the products of complex governance arrangements, and they have been able to address the market failures that impede progress in fuel efficiency through technological innovation. The European Union's preparation work has been very perfect, and further promotion of EU ETS is the only way to meet the European Union's own needs for emission reduction.

Identification and Impact of the EU unilateral action

Violation of the “common but differentiated responsibilities principle”

The EU unilateral action violates the “common but differentiated responsibilities principle” established by the UNFCCC and the Protocol. Because developing countries are not required to undertake specific CO₂ emission reduction obligations at the present stage according to the principle of common but differentiated responsibilities. With the impetus of the European Union, through a coercive vote: the IMO adopted the Amendment to the regulations on energy efficiency for ships in Annex 6 “Regulations for the Prevention of Atmospheric Pollution from Ships, 1973, as amended by Protocol 1978” (hereinafter referred to as “MARPOL73/78”) in 2011. For the first time in IMO history, the EEDI and SEEMP standards, applicable to all seagoing merchant ships with a tonnage of more than 400 tons, were adopted by the IMO in relation to the reduction of GHG emissions.^③ In this annex VI, the

^① MARTIME B. Technical support for european action to reducing greenhouse gas emissions from international maritime transport [J]. CE Delft, 2009, 10(1): 132-145.

^② Regulation 2015/757 of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport [2015] OJ L123/55.

^③ In accordance with Article 16 of the MARPOL Convention, amendments to the MAPROL Annex require the support of two-thirds of the Member States. At the 62nd MEPC Conference,

“Non-Discrimination Principle” is adopted with regard to the allocation of State responsibility. The “Non-Discrimination Principle” means that all emission reduction systems and regulations of IMO apply equally and indiscriminately to all flag countries. This principle ignores the difference of the object of GHG emission reduction of ships and the idea of international responsibility justice in this field, and goes against the existing “common but differentiated responsibility principle”. So many developing countries, including China, have made reservations to the relevant articles of this principle.

The “common but differentiated responsibilities principle” established by the UNFCCC and the Protocol is a basic principle of international law for the international community to deal with climate change and the cornerstone of the current international legal system for emission reduction. The formulation of marine transportation emission reduction rules by the IMO should also be based on the authorization granted by the Protocol. Clearly, the IMO’s adoption of mandatory energy-efficiency standards for ships, regardless of their countries, violates the “common but differentiated responsibilities principle” that it should adhere to, and sets mandatory quantitative technical indicators for developing countries.^① As a supplementary clause of UNFCCC, Protocol is the most relevant international law basis for shipping carbon emission reduction under UNFCCC framework.^② The Protocol should inherit the “common but differentiated responsibilities principle” of the UNFCCC, and the specific trading rules and industrial standards for shipping carbon emission reduction promoted by the IMO shall conform to the said principle. It can be said that the EU indirectly raised the GHG emission standard by putting

the EU finally received enough support to amend MARPOL Annex VI to include the currently non-mandatory Energy Efficiency Design Index for New Vessels and the Ship Energy Efficiency Management Plan in Annex VI, making it a mandatory standard that must be implemented and followed by the global shipping industry.

^① Ying Yao. Analysis on the route of shipping emission reduction under the principle of “common but differentiated responsibilities”, *The contemporary law*, 2012.

^② Article 3 of the UNFCCC clearly puts forward the principle of common but differentiated responsibilities. Paragraph 3 and 5 of Article 4 further clarify that developed country Parties should assume more obligations to help developing countries. Paragraph 7 further specifies the restrictive obligations and responsibilities of developing countries.

pressure on the IMO to revise the ship energy efficiency standard, which is a violation of the “common but differentiated principle” set by the international convention. And its unilateral action should be characterized as a violation of international law.

The EU Unilateral action of infringing on the interests of developing countries

The EU ignores the fact that the issue of carbon emission reduction needs to be dealt with through multilateral consultation. Its unilateral regulation does not conform to the principles of international law and does harm to the interests of other countries. Shipping itself is a green mode of transport, and it is relatively difficult to “green” this mode of transport, especially for developing countries. It is for this reason that the international community finally excluded international maritime transport from the scope of adjustment of the Protocol.^① To achieve GHG emission targets, the Protocol provides for the Joint Implementation Mechanism (JI), the Clean Development Mechanism (CDM) and the Emission Trading Mechanism (ET) established in Articles 6, 12 and 17, with a view to achieving the emission reduction targets as soon as possible. JI and ET are mainly aimed at developed countries. Therefore, the Protocol does not impose mandatory emission reduction obligations on developing countries. The unilateral action of the EU sets mandatory technical targets for developing countries, which also breaks the obligations imposed on developing countries by the Protocol, increases the burden on developing countries and violates the basic principles of the UNFCCC. Similarly, any measure introduced by the IMO should not contradict the UNFCCC’s principle of common but differentiated responsibilities and liabilities. Meanwhile, developing countries need a transition period before formulating mandatory emission standards. The IMO mitigation measures should be applied to developed countries, and developing countries should not undertake the same obligations as developed countries. For example, the Hellenic Shipping Co-operation Council (GSCC) found that the implementation of the IMO emissions reduction plan was largely encouraged by the European Union. Greece and other

^① Bin Hu. International law analysis of carbon emission trading scheme in EU maritime transport. [M] China Social Sciences Press, 2017.p32.

developing countries oppose the market mechanism for emission reductions and believe that if the IMO simply formulates and implements rules for emission reductions instead of taking into account the consumer factor, it will undoubtedly do great harm to the international public.^①

EU unilateral implementation of the shipping ETS will also have a significant impact on the future international climate change negotiations. If developed countries use the EU Shipping ETS as a starting point to break through the “common but differentiated responsibilities principle”, they can invoke the precedent of the EU Shipping ETS to deny it in other areas of international cooperation. This is an important reason why developing countries strongly oppose it. The possible impacts of this action include: first, in terms of the development speed of our shipping industry, our ships' ability to save energy and control pollution obviously lags behind, and our shipping operators have to undertake the obligation of emission reduction under the EU shipping carbon emission trading system, or they have to maintain route operation by purchasing additional emission quotas. Second, the EU can't ensure the shipping operator will not put additional carbon emissions costs by raising the freight and so on way to pass on to the shipper. As for China's international shipping and trading business shows an increasing trend year by year, the international shipping operator's economic pressure caused by the EU unilateral action will finally be paid by the shipper and the ship owners in our country.

The Legislative Dilemma of Carbon Neutralization in China

Through sorting out the policy and legal system on carbon emission reduction in China, it is found that there are some problems in low-carbon legislation. In order to achieve the goal of carbon neutrality, the fragmented and faulted legislative mode needs to be corrected, and the systematization of low-carbon legislation is imperative.

Sort of Existing Policies, Documents and Legal Norms

^① Yang Xiao. International Maritime Emission Reduction Game: How China Avoids the “Carbon Trap”, *Pacific Journal*, 2013. p77-85.

China will reach carbon peak and achieve carbon neutrality as soon as possible. In terms of policy formulation, laws and regulations, the concepts of “low carbon”, “climate change”, “GHG”, “CO2 emissions” and “carbon emission reduction” are mainly involved. Through the legal information network of Peking University with several concepts as key words to search statistics to get the following data.

1. Where the keywords of “low-carbon” are involved, the National People’s Congress and its Standing Committee have a total of zero laws and regulations, the State Council has a total of two administrative regulations and 73 departmental rules. There are 2 local laws and regulations, 127 local normative documents, 634 local working documents, and 1 international treaty. However, most of these provisions are opinions, guidance, circulars or plans, which fall into the scope of policy documents.

2. Where the keywords of “climate change” are involved, the National People’s Congress and its Standing Committee have a total of 0 laws and 2 legal documents; the State Council has a total of 8 administrative regulations and 90 departmental rules. There is a total of 1 local governmental rule, 33 local normative documents, 353 local working documents, and 33 international treaties. Treaties are obviously more than laws and administrative regulations, and the level of domestic legislation is lower. Meanwhile, most of these provisions are opinions, guidance, circulars or plans, which fall into the scope of policy documents.

3. Where the keywords of “GHG” are involved, the National People’s Congress and its Standing Committee have a total of 0 law; the State Council has a total of 2 administrative regulations and 16 departmental rules. There is a total of 48 local laws and regulations, 155 local normative documents, and 0 international treaties.

4. Where the keywords of “CO2 emission” are involved, the National People’s Congress and its Standing Committee have a total of 0 law; the State Council has a total of 0 administrative regulations and 6 departmental rules. There is a total of 1 local normative document, 23 local working documents, and 0 international treaties.

5. Where the keywords of “Carbon emission” are involved, the National People’s Congress and its Standing Committee have a total of 0 law; the State Council has a

total of 0 administrative regulations and 2 departmental rules.^① There is a total of 0 local normative document, 6 local working documents, and 0 international treaties.

The researching results show that in terms of carbon neutralization, in terms of comparison between international conventions and domestic laws, treaty regimes are more while domestic laws are less and low-effective by contrast. Domestic policy instruments are more used, while legislative instruments are less used. As for the carbon neutral legislative system, it is mainly composed of departmental regulations and rules, and there are basically no laws and administrative regulations. Between central and local legislation, the latter is more than the former.

The Lag of Carbon Neutral Legislation

Generally speaking, the legal system consists of international law and domestic law. From the perspective of international law, the relevant international treaties that China participates in or concludes are all parts of the low-carbon legal system. China mainly acceded to conventions such as the UNFCCC and its Protocol as well as the Paris Agreement. In addition, there are a large number of multilateral or bilateral treaties entered into by and between China and international organizations and other countries which relate to carbon reduction and climate change.^② At the domestic legal level, the low-carbon provisions only exist in the policy documents, in the law, the administrative regulation level still lacks the corresponding system arrangement. This does not adapt to the development of the international environmental law and the

^① The latest departmental regulation is the *Measures for the Administration of Carbon Emission Trading* (Trial). The National Emission Exchange will soon be launched. The Hubei Emission Exchange will be responsible for the operation of the national registration system, and the National Emission Exchange Center, as a centralized trading platform, will be built by the Shanghai Environment and Energy Exchange.

^② Such as *China-EU clean energy center joint declaration*, *China, India, Japan, South Korea, the us energy secretary, five countries joint statement*, *the joint statement on climate change law of the People's Republic of China and the republic of Turkey's energy sector economic and technical cooperation framework agreement*, *the government of the People's Republic of China and the Australian government on further close co-operation on climate change of the joint Statement*, *Joint Statement between the People's Republic of China and the Republic of France on Addressing Climate Change*, *Memorandum of Understanding between the National Development and Reform Commission of the People's Republic of China and the Department of Energy and Climate Change of the United Kingdom of Great Britain and Northern Ireland on Low-Carbon Cooperation*, etc.

international energy law. The international law does not transform the international law into the domestic law in time. This is also inconsistent with the trend of strengthening low-carbon legislation to deal with climate change in the world, which shows that domestic legislation deviates from "globalization" and international cooperation.

Since joining UNFCCC, China has issued a large number of policy documents on climate change, which constitute the basis of low-carbon policy.^① For example, National Development and Reform Commission (NDRC) promulgated the *Circular on Carrying out Pilot Projects of Low-carbon Provinces, Regions and Cities*, decided to first carry out pilot projects of low-carbon provinces, regions and cities in "Five Provinces and Eight Municipalities" (Guangdong Province, Liaoning Province, Hubei Province, Shaanxi Province, Yunnan Province, Tianjin, Chongqing, Shenzhen, Xiamen, Hangzhou, Nanchang, Guiyang and Baoding). It can be seen that policies play a leading role in promoting low-carbon development. At the same time, China has adopted various measures to deal with low-carbon issues, such as energy conservation and promotion of energy efficiency, elimination of backward production capacity with high energy consumption and heavy pollution, so as to promote industrial upgrading and economic transformation, promote the reform of energy production and consumption, and promote clean and low-carbon energy utilization. However, these policies and measures are the response of the government in the administrative level, the current legislation, especially the law and administrative law level, do nothing. The current laws and administrative regulations do not embody the low-carbon concept or the way of regulation, there is no special low-carbon legal system arrangement, the legislation seriously lags behind the policy development.

^① Representative policy documents include *China's National Program for Addressing Climate Change*, the *Eleventh Five-Year Plan for National Environmental Protection*, the *Resolution of the Standing Committee of the National People's Congress on Actively Addressing Climate Change*, and the *Special Action on Climate Change Science and Technology*. At the provincial level, in order to implement *China's National Program on Climate Change*, all local governments have formulated their own climate change plans and put forward their own strategies, goals, key areas and specific measures to address climate change.

Dilemma of the fragmented legislative model

In China, despite many low carbon related laws, many of these laws are indirect.^① Low-carbon legislation is fragmented, with provisions in several laws as shown in the table below.

Law	Article	Content
PRC Environment Protection Law	6	Citizens shall enhance their awareness of environmental protection, adopt a low-carbon and frugal lifestyle, and conscientiously perform their obligations to protect the environment.
Law on the Prevention and Control of Environmental Pollution by Solid Waste of the PRC	3	The State advocates a simple, moderate, green and low-carbon lifestyle and guides the public to actively participate in the prevention and control of environmental pollution caused by solid waste.
Law on Prevention of Air Pollution of the PRC	7	The State advocates a simple, moderate, green and low-carbon lifestyle and guides the public to actively participate in the prevention and control of environmental pollution caused by solid waste.
	50	The State advocates low-carbon and environmental-friendly commuting, and shall vigorously develop urban public transport and increase the proportion of commuters using public transport under reasonable control of motor vehicle ownership based on urban planning.
PRC Marine Environment Protection Law	13	Enterprises shall give priority to the use of clean energy resources and to the adoption of clean

^① In the field of environment protection area, China enacts many regulations. Such as the *Environmental Protection Law*, the *Law on the Prevention and Control of Environmental Pollution by Solid Waste*, the *Law on the Prevention and Control of Air Pollution*, the *Law on the Promotion of Cleaner Production*, the *Law on the Promotion of Circular Economy*, the *Law on the Protection of Marine Environment*, the *Law on the Management of the Use of Marine Areas*, and the *Law on Renewable Energy* and the *Law on Energy Conservation* in the field of energy.

		production technology with high utilization rate of resources and low discharge of pollutants, thereby preventing pollution to the marine environment.
PRC Renewable Energy Law	2	For the purpose of this Law, renewable energy refers to non- fossil energy such as wind energy, solar energy, water energy, biomass energy, geothermal energy and ocean energy.
PRC Energy Conservation Law	3	The term "energy conservation" as used in this Law means: enhancing management in the use of energy; and adopting measures that are technologically feasible, economically rational and, by reducing consumption, reducing losses and pollutant discharges, and stopping waste in all phases from energy production to its consumption, so as to achieve an efficient and rational utilization of energy resources.

In recent years, in order to meet the urgent needs of carbon emission control, the relevant authorities have begun to issue relevant departmental rules. The aforementioned departmental regulations mainly include the *Tentative Measures for the Administration of Foreign Cooperation in the Field of Response to Climate Change* (2010), the *Tentative Measures for the Administration of Trading of Voluntary Emission Reduction of Greenhouse Gases* (2012), the *Tentative Measures for the Administration of Certification of Low-carbon Products* (2013) and the *Measures for the Administration of Trading of Carbon Emission Rights (Trial Implementation)* (2020). Regulations reflect the spirit of the policy and are conducive to the implementation of the policy. However, the regulation is in the lowest position in the legal effect level, it only has the reference significance in the judicial application, the application scope and the effect restriction all are obvious.

To sum up, the current energy law system does not directly or in any way have

little or no rules on low carbon emission control or emission reduction. The current energy law system is obviously inconsistent with the development and requirements of the low-carbon era. Carbon emission reduction is a global issue. EU laws and regulations on carbon emission reduction will have an impact on China in the near future, but China has not yet developed corresponding regulation measures. The EU ETS does not distinguish the nationalities of shipping operators and does not follow the “common but differentiated responsibilities principle”. In other words, the EU’s “one-size-fits-all” shipping emission control standards actually brings extra-territorial ships into the local jurisdiction system and will not be easily changed. Its system design is very disadvantageous to developing countries. So, it’s hard to get rid of some of that carbon burden for China’s shipping industry under EU regulations. The US, Japan and other countries through the establishment of their own shipping carbon emissions trading system to carry out mutual exemption negotiations with the EU, are worthy of our reference. China should establish its own shipping carbon emissions trading system as soon as possible.

Mitigated solutions to the EU Unilateral action Impact

Systematic legislation to create a legal system of low-carbon law

At the present stage, the promotion of low-carbon development is mainly carried out by means of policies and is not yet within the scope of legal control. It is true that policies can reduce carbon emissions in a certain period of time, but these policies or work arrangements lack long-term, stability, standardization and sustainability, and have exposed the drawbacks of no pre-designed and orderly legal arrangements. In the absence of legal support, protection and regulation, low-carbon policies may distort or even rebound in the implementation process. Therefore, in order to achieve the goal of carbon neutrality, low-carbon initiatives must be promoted from the policy level to the legislative level and the implementation level of laws and regulations.

Specific paths of legislation: the coordination of energy law and environmental law

Environmental Law

In the scope of environmental law, carbon dioxide does not identify as a type of pollution. So, the regulation of carbon emissions in environmental law is almost zero. But to achieve the goal of carbon neutrality, environmental law is an important adjustment to carbon peak. China's so-called carbon peak is not high peak. Environmental law control is a relatively easy way to achieve in the climbing stage of carbon peak. For example, if carbon emission regulation can be added to the *Air Pollution Prevention and Control Law*, or the assessment of adverse impacts on climate change can be taken into account in the *environmental impact assessment law*.

Energy Law

Taking energy legislation as the focus of the construction of low-carbon legal system is the key to mitigate low-carbon issues caused by the EU unilateral action impact. Because low-carbon development or climate change response is mainly the problem of energy, so the construction of low-carbon legal system should undoubtedly rely on the energy legislation. Energy legislation is the breakthrough of low carbon legal system. The legal construction of "low carbon" energy undoubtedly needs to start from the legislative link. The control of CO₂ emission reduction and the development of low-carbon energy will be a difficult task for China's energy legislation at present and in the future. Low-carbon development is mainly a matter of environment and energy, so it is necessary to combine energy and environment issues into consideration in legislation.

Attempts at voluntary agreements: Promotion of China Certified Emission Reduction (CCER) system

Voluntary agreements, as a new mechanism, have emerged in the field of environment management. Some foreign countries or regions have long carried out the practice of voluntary agreements in the field of environment management. In theory, it is called "public hazard prevention agreement" in Japan, "environmental protection agreement" in Taiwan, and "environmental contract" in common law countries such as Britain and the United States. Although the name of voluntary agreement is different in different countries or regions, it generally refers to the

agreement reached with the government for improving energy efficiency on a voluntary basis by the entire industry department or a single enterprise. Under the support of the government, voluntary actions are carried out in accordance with the expected target. Voluntary agreements are performed among multiagent compositions, such as business parties, non-governmental organizations and the social public. Through the use of voluntary agreement on energy conservation, it can just build a negotiation bridge for the multi-parties with different interest demands. ^①

Before 2012, Chinese enterprises mainly participated in the international carbon market through the CDM (Clean Development Mechanism) projects. However, with the European economic downturn and the end of the first phase of the Protocol, CER prices continue to fall, and CDM projects have been hampered. Under such circumstances, China began to establish a domestic voluntary Emission Reduction carbon credit trading market in 2012, and its carbon credit target was CCER (Chinese Certified Emission Reduction). In 2015, the voluntary emission reduction trading information platform was launched, and CCER entered the trading stage. In 2017, CCER project filing was suspended, and the stock of CCER was still in the major pilot transactions. By April 2021, the National Development and Reform Commission had published 2,871 CCER approved projects, put on record 861 projects, and put on record 254 emissions reduction projects. CCER can not only be used for the implementation of the domestic carbon emission trading market, but also help

^① In 1995, in order to reduce the emission of carbon dioxide, the Danish government promulgated the "Carbon Tax Law" and put forward the requirement of implementing voluntary agreements. Denmark industrial efficiency of voluntary agreement generally signed by the energy department and the enterprise, in order to promote the implementation of energy-saving voluntary agreements, the Danish government began in 1996 in a mandatory energy tax and carbon tax on the industry, to join protocol and not join the corporate, different amounts of, encourage enterprises to actively engage with energy-saving voluntary agreements, improving energy efficiency. By 2004, there were about 280 enterprises participating in the voluntary agreement, accounting for more than half of the total energy consumption of the Ministry of Industry. At the same time, the government has provided a large number of supportive policies to the participating enterprises, including through energy audits, special investigations and other procedures to assess the energy saving potential of the enterprises and to provide information on energy-saving projects and technologies suitable for the enterprises' situation. Through the implementation of the energy management system and the implementation of the energy audit to ensure that the enterprise in the daily production can be sustainable energy saving, the implementation of "beneficial" energy saving projects.

enterprises to be carbon neutral.

In March 2020, China's voluntary GHG emission reduction and trading system became one of the six CORSIA qualified emission reduction project systems recognized by the International Civil Aviation Organization (ICAO). This means that global aviation enterprises can fulfill their emission reduction obligations by purchasing CCER, which adds a new attribute to CCER as a compliance product in the international carbon market. Shipping industry and aviation industry have a high degree of similarity, both belong to high globalization industries. the CCER of Chinese aviation industry is recognized internationally, it can be speculated that it is feasible to bring the shipping industry into the CCER trading system to benchmark EU carbon emission control actions. Once China's national carbon emission trading system is officially put into operation, the offsetting mechanism can be used to promote the link of carbon markets in different regions of the world, which will also provide more options to help countries along the "One Belt and One Road" initiative to achieve low carbon emission reduction. Considering allowing the qualified enterprises as legal persons in the countries along the "area" to initiate CCER projects, and to explore the experience in the related countries build carbon pricing mechanism, and to establish carbon pricing system and introduce the offset mechanism for more countries and regions.

Conclusion

At present, major economies around the world are taking very strong measures to invest a lot of money in green and low-carbon fields to help the recovery of green economy, and China is also stepping up the pace. When it comes to carbon emission reduction, the shipping industry bears the brunt. China has always adhered to the position that comprehensive climate change negotiations should be completed first under the "common but differentiated principle" and then specific negotiations should be carried out according to the particularities of the shipping industry. However, it must be pointed out that if the global climate change negotiations are delayed

indefinitely, it should be studied in advance in the negotiations on shipping emission reduction conducted by IMO, so as to seek the shipping emission reduction scheme with the least impact on China's shipping industry. China's international shipping companies should also take precautions, step up research and development, equipment and other work, and make use of the current buffer period to upgrade equipment, in order to cope with the upcoming global or EU regional shipping emission reduction standards.

Low-carbon development is an extremely complex and comprehensive issue, involving economic, social, political, environmental and energy aspects. In the absence of laws and administrative regulations, it is impossible to promote a "low-carbon revolution" only by a few sporadic regulations, which is also an arduous task that regulations can't bear. Direct provisions on carbon reduction are largely blank, indicating a lack of legal institutional arrangements in this regard. Low-carbon provisions are also reflected in a number of policy documents, but they are not reflected at the level of domestic laws and administrative regulations. China has been committed to actively participating in low-carbon related international cooperation, on the issue of carbon emission reduction, the realization of China's goal will contribute to the realization of the global mission. China's energy law and environmental law should be unified and coordinated in the system design. Only when they coordinate and promote each other in terms of concrete content and concrete measures, and avoid the conflict between their legal system and legal system, can energy law and environmental law jointly shoulder the responsibility of fighting against climate change.

Energy conservation and emission reduction will become the core and medium - and long-term vision of ecological civilization construction and green development, and will have a complex and far-reaching impact. In achieving the goal of the carbon peak and carbon neutral in China, there are a series of severe challenges. In the case of multiple stakeholders to participate in, the central government must play a coordinating role, clarify the responsibilities of all parties, and promote good governance.

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