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Current Status and Legal Outlook of Carbon Market in Vietnam

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ABSTRACT: The results of the COP27 Climate Change Summit in Sharm El-Sheikh, Egypt mark the Vietnamese Government's strong commitment to net zero ('zero') emissions by 2035. Operating the domestic carbon market, step by step connecting with the international carbon market is a comprehensive solution chosen by many countries around the world, including Vietnam, to fulfill the committed target of reducing greenhouse gas emissions, towards the realization of a green economy.

KEYWORDS: Carbon market; Greenhouse gas emission; Green growth; Climate Change; zero-carbon

I. INTRODUCTION TO THE RESEARCH PROBLEM

Green growth is an inevitable choice for every country in the context of increasingly obvious environmental, economic and social consequences of climate change. Since 1970, the concept of Green Growth has gradually become popular worldwide, and has not only stopped at an idea of a system of socio-economic development policies but has gradually been concretized by a system of legal regulations to establish and operate mechanisms that are suitable specific goals. Reducing Greenhouse gas emissions is one of the key contents that many governments of many countries are interested in, committed to and recognized in many legal documents at international, regional and national levels from 1997 to present.

In Vietnam, policies and laws have mentioned solutions for

Greenhouse gas commercialization since the period of 20002005. However, commitments and efforts to build a legal framework have been focused on and strongly implemented in the past 5 years, especially after the Vietnamese Government's commitment to the goal of "zero carbon" by 2050 at the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change in Glasgow, UK (COP 26). The article on "Current status and prospects of the carbon market law in Vietnam" summarizes and analyzes, clarifies the context and requirements for perfecting Vietnam's legal framework in the coming period to meet international commitments on reducing greenhouse gas emissions.

II. THEORETICAL BASIS AND RESEARCH METHODS

Carbon market is an interdisciplinary legal research topic including international law and national law. Carbon market is also related to the world's progressive general trends in establishing progressive and modern development standards such as: green growth; green economy; circular economy... From the perspective of international public law, Carbon market is studied from the angle of international treaty law, international environmental law and related to international judiciary regulating the purchase and sale of GHG emission rights with foreign elements. Synthesis of international research shows that the level of legal perfection on carbon market depends on the resource conditions in each country and region. From small scale in each state of the United States to national scale, and more broadly to regional scale, the market for buying, selling, exchanging, transferring carbon certificates tends to expand worldwide. Carbon market solutions contribute to narrowing the differences between developed and developing countries in implementing greenhouse gas emission commitments. From there, countries tend to participate or build their own markets.

The research is conducted on the basis of classical economic theories such as: Adam Smith's theory of free competition; Ronald H. Coase's transaction cost theory; Pareto efficiency theory... combined with legal theories in international environmental law including theory of sustainable development; John Rawls's fairness theory and the 'polluter pays principle' principle.

The research uses social science research methods, specifically based on the synthesis of theories, practices and data from secondary sources to analyze and evaluate the current legal status of Vietnam's carbon market; concurrently, using the comparative legal method to grasp the experience of building policies and laws of regions and countries on carbon markets.

III. RESEARCH RESULTS

A. Carbon Markets and The Relationship with Sustainable Development and Green Growth

First appearing in 1980 in the World Conservation Strategy (published by the International Union for Conservation of Nature and Natural Resources - IUCN), the concept of 'sustainable development' is understood as development that satisfies the needs of the present and does not harm the ability to meet the needs of future generations, focusing on three main areas including economy - society - environment. Since then, sustainable development has become a common goal of humanity, including Vietnam. To achieve sustainable development goals, Green Growth is an initiative that sets goals for legislators and managers to improve the policy and legal framework with a focus on reducing greenhouse gas emissions and promoting the use of clean energy, renewable energy, greening production, greening lifestyles and promoting sustainable consumption. In which, the Carbon Market is a key solution of Green Growth.

Many studies on the carbon market have noted the significance of recognizing *the right to emit greenhouse gases* as a commodity that can be exchanged and transferred. This is also an important basis for the formation of a trading market. According to Zewei Yang, "*the right to emit greenhouse gases*" is understood as "the right to discharge greenhouse gases into the atmosphere that is recognized naturally or by law" (Zewei Yang, 2012, p.108). According to research by the Food and Agriculture Organization of the United Nations - FAO, the right to emit carbon can be considered a derivative of the "right to food and access to natural resources" (FAO, 2008, p.4). Thence, "*gas emission trading*" - the basis of the Carbon Market, initially originated from the studies of economists including Coase (1960, p.10), Crocker (1966, p.19/24), Dales (1968), and Montgomery (1972) proposed a mandatory requirement for emission rights holders to emit only a specific amount of pollutants over a limited period of time, and that the emission rights could be transferred if the regulatory agencies determined a ceiling for the total emissions…(Dales, J. H., 1968, p.102). This idea was repeated in 1995 in the United States with the model of exchanging “SO2 gas quota” instead of CO2 and other greenhouse gases.

In the early 21st century, these theories were applied again in the implementation of the "Cap and Trade" mechanism of the European Union Emissions Trading System (EU ETS) and were stipulated in Article 17 of the 1997 Kyoto Protocol, specifically "*The Conference of the Parties shall specify appropriate principles, methods, rules and guidelines, in particular for verification, reporting and accountability for emissions trading*". Continuing to be inherited in Article 6 of the 2015 Paris Agreement, it recorded the agreement of the Parties to cooperate in implementing the Nationally Determined Contribution (NDC) with the use of market-based mechanisms (carbon markets). To achieve the target of reducing emissions as committed, the Governments only need to gradually reduce the total amount of CO2 emissions each year. This creates an incentive for production units to improve their technological processes or increase investment in clean technology because it becomes cheaper than buying quotas in the context of increasing quota transaction prices due to scarce supply. This is the operating foundation of the carbon market.

For Vietnam, after committing to zero net emissions by 2050 at COP26 (2021), Vietnam continues to receive a commitment to support 15.5 billion USD for a just energy transition (JETP) after COP27 (2022), and actively joins international economic integration commitments such as EVFTA, and CPTPP, requiring meeting global criteria on Environment-Social and Governance (ESG). As of November 2022, Vietnam has 276 projects issuing a total of 29,391,066 CDM credits; 32 projects issuing a total of 5,760,591 GS credits; 27 projects issued a total of 1,352,939 VCS credits. The hydropower sector accounts for the majority. On September 25, 2012, the Prime Minister of Vietnam approved the National Strategy on Green Growth under Decision No. 1393/QD-T Tg. On March 20, 2014, the Prime Minister issued Decision No. 403/QD-TTg approving the National Action Plan on Green Growth for the period 2014-2020. On that basis, provinces, cities; Central ministries and branches have been developing Green Growth Action Plans for localities and each sector and field. In October 2021, the Prime Minister issued Decision 1658/QD-TTg in 2021 approving the National Strategy on Green Growth for the 2021-2030 period, with a vision to 2050, setting the general goal of "Green growth contributes to promoting economic restructuring associated with growth model innovation, aiming to achieve economic prosperity, environmental sustainability and social equity; towards a green, carbon-neutral economy and contributing to the goal of limiting global temperature rise".

Cocurrently, it sets a specific goal of striving for the intensity of greenhouse gas emissions per GDP to decrease by at least 15% compared to 2014. The goal by 2050 is to reduce the intensity of greenhouse gas emissions by at least 30% compared to 2014.

Recognizing the impact of climate change on national socioeconomic development, Vietnam supported and ratified the UNFCCC Framework Convention on November 16, 1994; proactively participated in other legal agreements related to mitigating the negative impacts of climate change, including Kyoto Protocol (signed in 1998, ratified in 2002); Doha Amendment to the Kyoto Protocol (ratified in 2015); Paris Agreement (ratified in 2016). Vietnam has established a National Steering Committee for the implementation of the Climate Convention and the Kyoto Protocol; sent the UNFCCC Secretariat the First National Communication (2003), Second National Communication (2010), First Biennial Update Report (2014); Vietnam's Nationally Determined Contribution - NDC (2015). A series of policies, legal documents, programs and plans have been issued to meet the requirements of climate change response, specifically, Resolution No. 24-NQ/TW dated June 3, 2013 of the 11th Party Central Committee on proactively responding to climate change, strengthening resource management and environmental protection; Law on Environmental Protection 2020; Resolution No. 120/NQ-CP dated November 17, 2017 of the Government on sustainable development of the Mekong Delta in response to climate change and the Comprehensive Action Program to implement Resolution No. 120/NQ-CP. Vietnam also established the National Committee on Climate Change in 2012 chaired by the Prime Minister; the Ministry of Natural Resources and Environment is the national focal point for implementing the UNFCCC; Kyoto Protocol; Paris Agreement and other international treaties related to climate change and developing biennial Update Reports; Vietnam's National Communications to the UNFCCC.

From 2021 to present, Vietnam has committed to reducing greenhouse gas emissions compared to the Business-As-Usual (BAU) emission level by 2030, including specific emission reduction targets for each sector. 2022 marks progress in lawmaking in related fields, especially after the Vietnamese Government committed to reducing emissions to "zero" by 2050 with the official promulgation of Decree 06/2022/ND-CP; Circular 01/2022/TT-BTNMT and the Set of Administrative Procedures (announced under Decision 59/QD-BTNMT). Currently, the Project on developing the carbon market in Vietnam and the system of administrative procedures have been approved, contributing to the formation of the first legal frameworks.

B. Current Status Of The International Carbon Market And Related Legal System

Currently, there is no common standard for building and perfecting the carbon market - a place where carbon credits are exchanged between individuals, and organizations. The basis for the Emission Trading System (ETS) is Article 17 of the Kyoto Protocol, which came into effect on February 16, 2005. A global diplomatic standard is also applied, called Common But Differentiated Responsibilities (CBDR), which means a common goal for all countries but different responsibilities between developed and developing countries due to large differences in income, resources, technology, etc. Developed countries (in Annex 1 of the Protocol) have full responsibility for reducing emissions by 5% for the period 2008-2012 compared to the base year concentration of 1990. In contrast, developing countries (not in Annex 1 of the Protocol) have the option of a series of mechanisms called the Clean Development Mechanism (CDM) that allow these countries to be part (not required) of the Convention and voluntarily reduce their greenhouse gas emissions. greenhouse gas emissions if countries in Annex 1 pay them. From this provision, the world has formed a new type of commodity that can be exchanged, which is the "right to emit greenhouse gases", which is the premise for current ETSs. By 2024, the world has recorded 28 emission trading systems in operation and more than 20 similar systems are being planned and considered for operation (including Vietnam).

The world's carbon market exists in three forms: (i) International carbon market within the framework of the United Nations Framework Convention on Climate Change (UNFCCC); (ii) Voluntary international carbon market; (iii) Domestic carbon market.

Carbon market within the framework of the UNFCCC: The Kyoto Protocol of the UNFCCC, which came into effect on February 16, 2005, requires countries to make commitments and implement quantitative greenhouse gas emission reductions. To achieve the ultimate goal of the UNFCCC in stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human interference with the climate system and help developed countries comply with quantitative greenhouse gas emission reductions, the Kyoto Protocol provides three flexible mechanisms as mentioned including Joint Implementation Mechanism (JI); Emissions Trading Mechanism (ET) and Clean Development Mechanism (CDM) to be implemented until 2020. Of which, Vietnam does not apply the two mechanisms JI and ET.

Voluntary international carbon market: The voluntary international carbon market aims at the need for voluntary trading of carbon credits to serve the social responsibility of enterprises and improve their public image, for example Nike, General Motors, Barclays, Delta Air Lines, Qantas Airways... and to create additional credit supply for the domestic carbon market.

The voluntary international carbon market is governed by a variety of standards depending on the requirements of the buyers. Currently, the Verified Carbon Standard (VCS) and the Gold Standard (GS) are widely used.

Domestic carbon market: In addition to purchasing carbon credits from abroad to contribute to the shortfall in their greenhouse gas emission reduction commitments, many countries have established a domestic greenhouse gas emission quota trading system (domestic carbon market). This is a tool aimed at setting a ceiling on greenhouse gas emissions for domestic enterprises to achieve the country's greenhouse gas emission reduction target, while also encouraging domestic enterprises to research and apply measures and technologies to reduce greenhouse gas emissions. To establish a domestic greenhouse gas emission quota trading system, a government or intergovernmental agency is responsible for allocating or selling a limited number of greenhouse gas emission quotas (credits) (usually specified in tons of CO2e) over a period of time. Enterprises that emit more will have to buy credits from parties who wish to resell. Accordingly, the buyer will have to pay the costs arising from increased emissions, while the seller will benefit from the reduction of greenhouse gas emissions.

It can be seen that the European Union and Latin America are the regions with the fastest speed of building and actively completing the emission trading system. Accordingly, the European Union is leading with the participation of 28 member states and 03 countries in the European Union free trade area: Iceland; Liechtenstein and Norway. The European Carbon Credit Trading System (EU ETS) is holding 45% of the total emissions of the entire EU industry.

In 2021, 197 countries participating in the UNFCCC adopted the Glasgow Climate Agreement, which includes 8 main contents with 71 provisions. Accordingly, reaffirming the long-term goal of controlling the global average temperature increase to below 2oC and pursuing efforts to limit the increase to 1.5oC (compared to pre-industrial levels), thereby requiring global greenhouse gas emissions to be reduced rapidly, deeply and continuously, in which CO2 emissions must be reduced by 45% by 2030 compared to 2010 levels and to zero by 2050. Currently, countries around the world mainly rely on the principle of Good faith in implementing international commitments (Good faith) stipulated in Article 26 of the Vienna Convention on the Law of Treaties 1969 and the principle of Respect for international commitments (Pacta sunt servanda) to implement commitments to reduce greenhouse gas emissions within the framework of the Paris Agreement or the Glasgow Climate Agreement.

1.Carbon Market in the European Union: The EU Emission Trading System (EU ETS) is the world's first, oldest and largest carbon market with 31 member states (including 28 EU member states plus Iceland, Liechtenstein and Norway), accounting for 45% of Europe's greenhouse gas emissions (EC, 2015, p.15). The EU ETS was developed to be implemented in four phases: Phase 1 from 2005-2007; Phase 2 from 2008-2012; Phase 3 from 2013-2020; and Phase 4 from 2021 onwards. The EU ETS operates on the "Cap and Trade" principle (mentioned in section 2). The EU sets emission ceilings for the whole bloc and reduces them year by year (only from Phase 3 onwards, before that the emission ceiling is the same for each year). Within that emission ceiling, emitters are given allowances or have to buy emission allowances, and can sell them if they do not use them all.

In Phases 1 and 2, the annual emission ceiling is determined for the whole period, but from Phase 3 onwards, the emission ceiling will be gradually reduced each year with a linear coefficient of 1.74% compared to 2010. Corresponding to the change in the way of determining the emission ceiling, the method of allocating "emission allowances" in Phase 3 also changes. In Phases 1 and 2, most emission allowances are allocated free of charge. In Phase 3, the default method is for emitters to purchase emission allowances, which is consistent with the "polluter pays" principle. However, to ensure that the necessary industrial development needs are met during the transition, especially for new entrants, 43% of the total emission allowances will be allocated free of charge in Phase 3. In addition, the EU is also concerned about the risk of "carbon leakage" - the case where businesses relocate production facilities to other countries with lower or even no pollution control regulations to save costs compared to cutting pollution on-site, thereby increasing their total actual carbon emissions. Therefore, the EU ETS lists sectors and sub-sectors with high risks of "carbon leakage" and provides free emission allowances to avoid the situation of shifting pollution to other countries, while creating incentives for them to set their own roadmap for applying low-carbon technology.

2.Carbon markets in some countries: *China's emissions trading system*: According to Swartz's research (Jeff Swartz, 2016, p.22), China piloted its own emissions trading system from October 2011 to July 2015. The pilots were implemented in five cities and two provinces that accounted for 26.7% of China's GDP in 2014 (Beijing, Tianjin, Shanghai, Hubei, Chongqing, Guangdong, and Shenzhen). The pilot process resulted in 57 million tons of carbon being traded. All seven pilots circumstances were designed by local governments based on a tripartite framework involving local Development and Reform Commissions (DRCs), local emission trading entities, and respected academic experts. All identified emission reduction targets (based on intensity), allowable emission thresholds, coverage areas, and base years (Jeff Swartz, 2016, p.10).

After the pilot phase, on June 19, 2016, the Central Development and Reform Commission (NDRC) of China issued a circular guiding the implementation of the specific National ETS system, including: Law on Management of Business and Trading of Carbon Emission

Rights (2020); China's Nationally Determined Contribution (2015); The 13th Five-Year Plan for Economic and Social Development (2016) (Ministry of Natural Resources and Environment, 2021, Explanatory Report on the Project for Developing the Carbon Market in Vietnam). The emission reduction target of China's ETS is determined in the form of "carbon intensity" in the economy, different from the determination by absolute value of greenhouse gases as in the EU system. While the EU strives to reduce greenhouse gas emissions, China reduces the ratio of carbon emissions to economic growth.

Another difference with the EU ETS, the mechanism of China's ETS is to allocate free allowances in the initial stage to limit "carbon leakage" as a lesson from Europe and to gradually move towards selling allowances after 2020. However, because it is still in the initial stages of operation, China still allocates an excess number of allowances (emission permits) for free, so liquidity and the trading market are not yet effective.

In addition to being allowed to trade allowances, businesses can trade offsets in the form of China Certified Emission Reductions (C-CERs) issued by the National Development and Reform Commission.

The US Emission Trading System: Currently, the US maintains three ETS systems built and operated quite effectively by US states, including: (1) California Cap-and-Trade Program; (2) Massachusetts Limits on Emissions from Electricity Generators; and (3) Regional Greenhouse Gas Initiative (RGGI). In addition, a number of ETSs are under development or being considered for implementation, such as: TCI Transportation and Climate Initiative; Pennsylvania; Virginia; New Mexico; New York; North Carolina; Oregon and Washington. First, let's evaluate the 3 systems currently operating in the United States:

- *Regional Greenhouse Gas Initiative (RGGI):* This is the first ETS system in the United States in the energy sector with the participation of the States: Connecticut; Maine; Maryland; Massachusetts; New Hampshire; New Jersey; New York; Rhode Island; Vermont, deployed since 2009 with 10 states according to the RGGI Joint Memorandum of Understanding in 2005. Up to now, RGGI is continuing to perfect the Model Regulations and adding stricter regulations to shape the system, moving towards the goal of reducing 30% of greenhouse gases by 2020. Because RGGI is a program, each participating state will implement it according to its management unit. In addition, the RGGI agency - a non-profit unit will stand up to build and operate the program throughout the term.
- *California ETS*: first implemented in 2012, the California Emissions Trading Program was initiated by the Western Regional Climate Initiative in 2007. To date, this California program has covered nearly 80% of the total greenhouse gas emissions in the United States. The agency responsible for implementing this program is the California Air Resources Board (CARB). The legal basis for the formation and operation of the California ETS is the State's Global Warming Solutions Act of 2006 (AB 32); the amended law AB 398.
- Massachusetts ETS: implemented in 2018 for the electric power sector, this system, together with RGGI, contributes to helping Massachusetts achieve the State's emission reduction goals. In 2016, through a decision by the Massachusetts Supreme Court, the state government was obligated to promote the state to meet its goal of reducing emissions by 25% by 2020 and 80% by 2050 (compared to 1990). The Office of Energy and Environmental Enforcement and the Massachusetts Environmental Protection Agency are the focal points for implementing this program. The legal basis for this program is the Electric Power Generation Facility Emissions Limitation Rule (Regulation No. 310CMR7.74).

3. Current status of Vietnam's legal system and prospects: The Party and State of Vietnam recognize the development of a carbon market as an important solution in Vietnam's response to climate change. Resolution No. 24/NQTW in 2013 of the Party Central Committee recognized the task of "*developing a domestic carbon credit exchange market and participating in the global carbon market*" as one of the groups of tasks to respond to climate change in Vietnam. That major policy continues to be specified in the 2020 Law on Environmental Protection passed by the 14th National Assembly, when for the first time the law devotes Article 139 to regulations on the Organization and Development of the Carbon Market, which mentions a domestic carbon market operating under the "mechanism of exchange, auction, borrowing, payment, transfer of carbon quotas and credits" and granting the right to resell "allocated emission quotas" to GHG emission facilities participating in the market. Other documents also reflect the policy of early establishment of a market for trading GHG emission rights and guiding regulations such as: Decree 06/2022/ND-CP mentioning the policy of encouraging project investors to participate in the carbon market; Decision No. 2053/QD-TTg dated October 28, 2016 of the Prime Minister promulgating the Plan for implementing the Paris Agreement on Climate Change; Greenhouse gas emission management project; management of carbon credit trading activities in the world market issued together with Decision No. 1775/QD-TTg dated November 21, 2012 of the Prime Minister.

The Ministry of Natural Resources and Environment has also issued a Circular guiding the measurement, reporting, appraisal and inventory of greenhouse gases, however, high technical requirements while limited business resources make it difficult to determine

the emission ceiling of businesses. In the context of current legal regulations in Vietnam, it is not possible to provide a complete legal framework for the operation of GHG emission rights trading.

From the above situation, the domestic carbon market in Vietnam needs to be gradually improved based on solutions to improve related laws focusing on 03 groups, including: (1) Solutions to create a conditional framework; (2) Solutions to a coordination mechanism; (3) Solutions to a trial legal framework.

Regarding the group of solutions to create a framework of conditions:

Firstly, it is necessary to improve administrative procedures, reduce the time for approving CDM projects, approving CERs and reducing administrative costs to a lower level than the current level to attract more investors to CDM projects, thereby creating a stable source of goods for the CERs trading market.

Secondly, new mechanisms in trading GHG emission rights such as public emission information, domestic and international emission auctions should be gradually piloted. Vietnam government should study and gradually pilot emission credits.

Thirdly, establish a specialized focal agency to manage the source of CERs eligible for trading, in order to organize classification, valuation, and public offer to ensure attracting domestic and international investors in need. However, while ensuring the management system and control mechanism, applying marketbased policies, the Government only manages and regulates, not intervening too deeply.

Fourthly, research and initially apply effective trading solutions in the form of online order matching; apply advanced software technology and management systems for carbon trading floors similar to stock exchanges or commodity exchanges for transactions that comply with regulations.

Fifthly, create a primary market with legal regulations for voluntary transactions such as carbon loans; carbon offset...

Regarding the group of solutions to build mechanisms and coordination tasks between ministries and branches in realizing the GHG emission trading market:

- Propose to the National Assembly, consider that in the process of building laws, ordinances, Resolutions on socio-economic development strategies and plans, there should be integration and mainstreaming of the content of building and forming a carbon market, initially integrating and mainstreaming into the 10-year socio-economic development strategy (2021-2030) and the 5year socio-economic development plan (2021-2025).
- The Ministry of Natural Resources and Environment shall preside over and coordinate with relevant ministries and sectors to focus on completing the review and updating of Vietnam's Nationally Determined Contribution (NDC) report, providing necessary information for public and transparent implementation, making efforts to implement contributions according to international commitments according to the emission reduction roadmap, and disclosing information to enterprises.
- The Ministry of Planning and Investment shall preside over and coordinate with the Ministry of Finance and the Ministry of Natural Resources and Environment to study and propose mechanisms and policies to prepare and mobilize resources to gradually proactively implement the contributions committed to international commitments on emission reduction.

Article 21 of Decree No. 06/2022/ND-CP clearly stipulates that the Ministry of Finance shall preside over the development and establishment of a carbon credit trading floor and promulgate a financial management mechanism for the operation of the carbon market. The Ministry of Natural Resources and Environment shall preside over and coordinate with relevant ministries to organize the pilot operation and official operation of the carbon credit trading floor to serve the management, monitoring and supervision of the carbon market; regulate the activities of connecting the domestic carbon credit trading floor with the regional and global carbon market; regulate the implementation of carbon credit exchange and offset mechanisms; develop propaganda documents and carry out capacity building activities for carbon market participants.

In addition, ministries, ministerial-level agencies, and provincial People's Committees shall be responsible for coordinating with the Ministry of Natural Resources and Environment and the Ministry of Finance to implement and promote the development of the carbon market; organize dissemination and propaganda on mass media to raise public awareness of the carbon market.

Sandbox legal framework solution based on international experience:

Firstly, carbon markets with large and complex scale and scope will often bring more efficiency but at the same time require more detailed preparation and legal and technical basis. Vietnam needs to consider the scale level at the initial stage of market establishment, which can be piloted at the industry scale (like the European Union) or voluntary (like Thailand), or local level mechanism (like China). The level of scope and scale of the market depends on the current status of policies, experience and the system of measuring, reporting and verifying GHG emissions reduction in Vietnam. With these factors still in the initial stage, Vietnam needs to have initial stages of

understanding market demand. Accordingly, the market structure can go from simple level to plans with more complex structures as the level of readiness of parties to participate in the market increases. Developing countries including Vietnam can implement simplified policies when the willingness to engage in transactions is low and gradually increase to more complex systems over time.

Although the scale of the carbon credit and quota trading system in Vietnam cannot be compared with China or cannot be as massive and detailed as the European Union market or as crosssectoral as the New Zealand market, the challenges and other potential solutions can be suitable for Vietnam's policy making and Vietnam can absolutely learn from the development steps of other countries and come up with an initial pilot roadmap. Specifically, it is possible to conduct pilot trading in one sector (for example, the steel industry, the cement industry, the electricity generation industry, the waste industry, etc.), with the view of adding other sectors at a later stage, or it can be piloted in some cities and regions with strong economic development (for example, Hanoi, or the Mekong Delta) and gradually expand the scale of the market.

Secondly, regarding market organization and operation, there are many lessons on state management to create a basis for readiness to trade on the carbon market that we can learn from international experience in building a carbon market for Vietnam such as the experience of China or Thailand, two countries with similar circumstances that are also piloting carbon market operations. Another advantage of Vietnam is that it has many years of experience and is actively operating in bilateral and multilateral credit creation mechanisms such as JCM and CDM. However, state management of carbon credit trading as a special commodity is quite new, with a wide scope, multi-sectoral, multi-field, carbon market management requires participation from the central level to the ministerial, sectoral, and local levels.

Thirdly, a system for measuring, reporting, and verifying GHG emission reductions (MRV) needs to be built and deployed. In the world, the successful development and implementation of MRV systems is the first step towards the formation of domestic carbon markets (as in the case of Thailand, Kazakhstan). The methods for measuring and assessing GHG emissions of actions and projects must be a product of a specifically regulated process to form a legal framework for mitigation activities in general and the MRV system in particular. The national MRV system will be based on a top-down approach for national mitigation targets and should be reflected in national legal documents such as Decrees and Decisions of the Prime Minister. Meanwhile, the proposed sectoral MRV will be based on a bottom-up approach without relying much on a centralized data collection system. Sectoral MRV systems will guide measurement at the project or sector level. The decentralization of approaches also brings practical benefits. Sectors that develop and implement MRV systems early will be able to enter the market sooner. Furthermore, the capacity to monitor, report and verify GHG emission reduction actions can be learned from existing experiences such as CDM, JCM, or ISO standards in environmental and energy management that are widely applied in Vietnam.

Fourthly, the future trend of “cryptocarbon”. In the study by Sarah Hall and Robert Fletcher (2018), the authors mentioned a fairly new concept for the GHG emission trading market, which is “cryptocarbon”, which is a combination of transactions on the GHG emission trading market with the application of blockchain technology in smart contracts to solve the problem of forest protection on a global scale. The “cryptocarbon” initiative also creates new legal challenges when applying blockchain - a distributed and immutable database to link carbon emissions in a natural asset market, contributing to attracting capital similar to the currently booming “cryptocurrency” market.

IV. CONCLUSION

Reducing greenhouse gas emissions is an important content of Vietnam's overall goal by 2020 to respond to climate change (Central Committee, 2013, Section II.2.a Resolution 24/NQTW), followed by the roadmap to perfect the domestic carbon market in Decree 06/2022/ND-CP. This shows the vital significance of reducing greenhouse gas emissions not only for Vietnam but also for the global scale. Currently, new activities stop at investigating, inventorying, and developing emission reduction plans for each sector, field, and locality without really focusing on a specific and effective solution to achieve internationally committed goals. The solution of a greenhouse gas emission trading market that has been and is being researched and effectively applied by the world will be a valuable lesson for the

State to soon apply in practice in Vietnam in the near future. With prepare for the birth of Vietnam's greenhouse gas emissions the available potential, the immediate task is to prepare the first trading market.

basic legal bases and gradually pilot market components to

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