Management strategy for carbon trading in Indo-Pacific common market

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Abstract: The global climate change caused by greenhouse effect is the most important thing that everyone is paying attention to today. The use of carbon trading to achieve carbon reductions is a recognized and effective way. However, in the face of complex economic development, there are different regions in the world that have formed a market for carbon trading. This paper proposes a common market mechanism based on the Indo-Pacific region. Under the reality that all member countries in the region have complementary, it is possible to achieve the goal of reducing emissions through carbon trading. First, explain the current carbon reduction trends and major carbon trading markets around the world. These include the region in which the market is located, the benefits of the exchange, the form in which the transaction can be used, and the legal norms that must be in place in actual operation. Secondly, discuss the reduction target strategies of countries and the operating conditions of the carbon trading market. Finally, the integration structure of the multi-country carbon trading market under the Indo-China common market are proposed.

1. Introduction

1.1 Why do we trade carbon?
The existence of developed industry has caused a lot of energy use in recent years. During the process of using energy, a large amount of carbon dioxide is emitted due to combustion, which causes the Earth to gradually rise its temperature, causing many negative ecological effects. For example, the Arctic iceberg melts, the water evaporation increases, the atmospheric circulation changes, the sea level rises, and the human activity area decreases, all because of the temperature raise [1]. Therefore, reducing the use of carbon and reducing emissions of carbon dioxide is the fundamental way to prevent the negative effects of climate change.

Many researchers have focused on how to reduce carbon emissions, such as reducing energy use [2], developing better equipment to make combustion more efficient [3], or changing people's living habits through education so as to let energy conservation become a kind of life quality for people [4]. However, the use of energy is an inevitable result of industrial development. Without affecting the sustainable development of the economy, it is a feasible way to adopt the tools of economics to manage carbon emissions. Based on this idea, this paper uses carbon trading as an argument to discuss how to properly extend this system to areas where carbon emission reduction is needed, so that the Earth's climate change
problem can be meliorated.

The United Nations Framework Convention on Climate Change and the Kyoto Protocol have clearly stipulate the obligations of the State party to reduce the carbon emissions in 2020 to 2008 levels. Carbon trading is a financial tool designed by economists to reduce carbon emissions. This trading method has been widely used in the EU [5][6]. The United States also has successful cases. China has experienced rapid economic growth in recent years, and its carbon dioxide emissions have grown rapidly. Therefore, in 2019, it has become the world's largest carbon trading market.

After China, Southeast Asia has also developed rapidly and become another emerging industrial economic system after China. India will become the most populous country in the world after China. The demand for industrial products will inevitably increase due to a large number of people, so it is expected that carbon emissions will also occur. How to make the economic development and ecological protection of this region equally important is exactly what environmental researchers concern with. Based on this, this paper proposes a common market for the Indian Pacific carbon trading, hoping to enable this financial instrument to be specifically implemented in this market through academic discussion.

Therefore, this article intends to explore the following issues:
1. The regional definition and vision of the Indo-Pacific Carbon Common Market.
2. The niche and development strategy of the Indian carbon trading market.

2. Literature Review

2.1 Global climate change
The demand for carbon trading originates from global climate change, so the current international agreement on carbon emissions is the most important source of market power for carbon trading. The United Nations Framework Convention on Climate Change (UNFCCC) is the beginning of carbon emissions control. The "Consultation Committee of the Intergovernmental Framework Convention on Climate Change" established by the UN General Assembly has been discussed at several meetings. In 1992, the UNFCCC was deployed [7]. In the third meeting of the Conference of the Parties (COP-3) in Kyoto, Japan, in 1997, the Kyoto Protocol was used to set specific reduction targets for six greenhouse gases, one of which is carbon dioxide. According to Article 2 of the Convention, the purpose of the Convention is to stabilize the concentration of greenhouse gases in the atmosphere, to adapt the climate system to climate change without human disturbance, and to take into account food production and economic development [8].

The members of the Convention can be divided into Annex I members, Annex II members, and non-Annex I members. Members of Annex I includes the Economic Development and Cooperation Organization (OECD) countries, the European Union, the United States, Japan, and Russia and Eastern European countries, whose responsibility is to return greenhouse gas emissions to their 1990 levels by the year 2000 and submit them. National newsletter describes the action plan and expected effect of achieving the goal. The Convention classifies developed countries as Annex II countries, including the above-mentioned OECD countries and the European Union, which are responsible for providing funds and technology to assist developing countries in response to climate change. Non-Annex I members includes the developing countries and emerging industrial countries headed by the Group of 77 and China. Those countries include South Korea and Singapore, whose mission is to conduct statistics on their greenhouse gas emissions and to describe their national conditions in the first national newsletter, greenhouse gas statistics, and prevention steps to be adopted. Non-Annex I countries have no commitment to reduce greenhouse gas emissions.

Parties build consensus to prevent climate change, reduce greenhouse gas emissions, and protect the climate system for the benefit of humans and future generations. In taking relevant actions, the objectives of the Convention should be achieved in accordance with the basic principles of the Convention, including the different reduction responsibilities assumed by each member. At the same time, it should be in line with the principle of fairness. It should also implement effective and consistent minimum cost control measures and take into account economic development needs.
2.2 Carbon trading
Due to the regulation of the Kyoto Protocol, the total amount of carbon emissions in various countries has been limited, resulting in a bottleneck in industrial development [9]. Carbon trading is a financial instrument developed in response to this dilemma. Its significance is to regard the carbon emitted by the enterprise as an object that can be traded. The amount of carbon that companies are allowed to emit can be considered as one of the assets of a company. Therefore, it is also called carbon emission right [10].

Carbon emission rights can be owned by the company from the beginning, or it can be bought by the company through other transactions. The right to buy and sell carbon emissions involves many issues, such as the checking of carbon emissions, the price of carbon emissions trading, and the regulations in different countries. Therefore, it must operate through a more rigorous financial market. The place that provides legal and normal operation of carbon trading is called the carbon trading market. The way of trading can be a futures or an option [11][12].

2.3 Today's carbon trading market
Since the emergence of the carbon trading system, there has been markets for carbon trading in all parts of the world. Generally, it can be divided into three major blocks: the EU carbon trading market, the North American carbon trading market, and the China carbon trading market.

The EU carbon trading market is the most mature market today. The United States reached its peak in emissions in 2007, the EU has steadily declined, and other countries (including Russia and Canada) have been relatively stable over the past 10 years [13][14]. During the same period, the greenhouse gas emissions in China and the United States increased by 4.3% and 1.4%, respectively. Even though the emissions of the largest emitters were growing in 2012-2013, their emissions had remained unchanged over the past 10 years if interpreted from a larger timescale. China is expected to surpass the EU in 2020 and become the largest carbon trading economy [15][16][17].

Some major emitters are reversing their trends. During 2012 to 2013, emissions from the top 10 emitters increased by 2.2%, while the average annual growth rate over the past 10 years was 2.4%. Energy-related CO₂ emissions data show that in 2014-2016, despite the growing global economy, the global energy-related CO₂ emissions data have remained stable, which is an encouraging trend. Further data also need to take into consideration if other types of greenhouse gas emissions increase or decrease, and whether this trend will continue [18].

2.4 Indo-Pacific Carbon Trading Common Market
Due to the rapid changes in the global economic situation, the Indo-Pacific region is expected to become another developing carbon trading market. In this study, the Indo-Pacific carbon trading market was excluded from North America and mainland China. The main reason is that these two regions already have mature markets, so they are not included. The remaining regions mainly include Japan, South Korea, Taiwan, Southeast Asia, Australia, New Zealand, India, and South Asian countries. These regions have different carbon trading needs due to their different levels of development, so they are expected to be integrated into a common market with market value. Figure 1 is the area of Indo-Pacific Carbon Trading Common Market.
3. Research Method

3.1 Strategic planning

In order to promote the carbon trading market with the Indo-Pacific Common Market as the main region, it is necessary to make a good assessment of the strategy of this program. This paper intends to make a more detailed evaluation of this program by means of strategic planning.

Strategic planning refers to the management of resources used by the program mission, organizational goals, basic plans and strategies to standardize the achievement of this goal. It is a process of developing analysis, communication and execution of selected strategies. Barry pointed out that, "Strategic planning is the organization's decision on the future development goals and how to achieve a decision-making process." Therefore, the strategic planning content includes: (a) elements; (2) evaluation; (3) choice; (4) Implementation; and (5) Evaluation and other five items [19].

Michael Porter proposed in 1985 the theory of value chain in the book, "Competitive Advantage", providing an important consideration of the strategic rules. He pointed out that: (1) various value activities that enterprises must undergo from raw material input to product output to the delivery of products to the final customer and (2) this value activity is divided into primary activities and support activities [20].

The main activities include: (1) inbound logistics, that is, incoming materials storage and transportation, and the establishment of resource markets; (2) manufacturing operations, that is, processing and production, and the manufacturer's market; (3) outbound logistics, that is, finished product storage and transportation, and belong to the middleman market; (4) marketing and sales, namely marketing (4P), to enter the consumer market; and (5) after sales service.

Support Activities include other activities that support core operational activities, also known as joint operations. Those includes: (1) human resources management training; (2) technology development, R & D; and (3) procurement, that is, procurement management.

3.2 SWOT strategy planning method

The steps of the strategic planning of this study are as follows: (1) first, self-assessment, looking for advantages and disadvantages, reviewing past strategies, analyzing the resources and the advantages of cost, quality, brand, efficiency, scale, technology, etc. (2) the second is to detect the environment (including the overall environment, industrial environment, and competitive environment) to identify the opportunities and threats of the environment; and (3) finally, propose a strategic vision, and must
consider whether it is consistent with the objectives of the plan. SWOT analysis was proposed by scholar Steiner in 1965 [21]. It is a thinking tool for analyzing the environment and its advantages and disadvantages. The main connotations are as follows: (1) first, under the opportunities and threats faced by the organization, assess its main advantages and disadvantages; (2) second, its main components include S: strengths, W: weaknesses, O: opportunity, and threats, T. SWOT provides a clear approach to strategic planning, allowing us to have a clear plan for promoting the Common Market for Indo-Pacific Carbon Trading.

4. Results and discussion

4.1 The scope of the Indo-Pacific Carbon Trading Common Market
The idea of the Indo-Pacific Carbon Trading Common Market is derived from the concept of the Indo-Pacific Geographical Region, which is the main target of the Indian Ocean and the adjacent regions of the Pacific Ocean. This area was originally a concept of a geographical area, but after a comprehensive consideration of economic geography and physical geography, it has different meanings. Cultural and economic exchanges have created the possibility of this common market development. Figure 1 shows the major areas that the Indo-Pacific common market cover [22].

![Figure 1. The Indo-Pacific Common Market](image1)

Figure 2. Areas covered by the Indo-Pacific Carbon Trading Common Market (Google, n.d. [24])

4.2 The Indo-Pacific common market and its social economic conditions
Existing carbon trading markets include: (1) EU carbon trading market; (2) North American carbon trading market; (3) China carbon trading market; and (4) East Asian carbon trading market.

Since 1990, the population growth, living standards and the dependence of fossil fuel as a source of energy have increases in this area. We should discuss the social and economic condition in particular. Because China has a close relationship with ASEAN, and it is already the world's largest carbon trading region, the two regions have economic complementarities. Also, India has the tendency to become the largest economic area, so before delving into it, we need to know more about it. Table 1 shows the social and economic conditions of the countries.
### Table 1 Social and economic conditions of Indo-Pacific countries [23]

| Country     | Population (10,000 people) | GDP (2017 US dollars) | Per capita GDP (2017 USD/person) | GDP Annual average growth rate% (2017) | Share of world GDP |
|-------------|----------------------------|-----------------------|----------------------------------|---------------------------------------|--------------------|
| Brunei      | 43                         | 12,128,089,002        | 41383.7                          | 1.33%                                 | 0.01%              |
| Cambodia    | 1652                       | 22,158,209,503        | $1,384                            | 7.10%                                 | 0.03%              |
| Indonesia   | 27108                      | $1,015,420,587,285    | $3,837                           | 5.07%                                 | 1.25%              |
| Laos        | 718                        | 16,853,087,485        | $2,424                           | 6.89%                                 | 0.02%              |
| Malaysia    | 32015                      | 314,710,259,511       | $10,118                          | 5.90%                                 | 0.39%              |
| Myanmar     | 54103                      | 67,068,745,521        | $1,256                           | 6.76%                                 | 0.08%              |
| Philippines | 10651                      | 313,595,208,737       | $2,982                           | 6.68%                                 | 0.39%              |
| Singapore   | 564                        | 323,907,234,412       | $56,746                          | 3.62%                                 | 0.40%              |
| Thailand    | 6918                       | 455,302,682,986       | $6,579                           | 3.91%                                 | 0.56%              |
| Vietnam     | 9616                       | 223,779,865,815       | $2,366                           | 6.81%                                 | 0.28%              |
| China       | 139500                     | $12,237,700,479,375   | $8,612                           | 6.90%                                 | 15.12%             |
| Japan       | 12650                      | $4,872,415,104,315    | $38,214                          | 1.71%                                 | 6.02%              |
| South Korea | 5123                       | $1,530,750,923,149    | $29,958                          | 3.06%                                 | 1.89%              |
| Taiwan      | 2357                       | $535,500,000,000      | $22,683                          | 1.7%                                  | 0.67%              |
| Hongkong    | 730                        | $341,449,340,451      | $46,733                          | 3.79%                                 | 0.42%              |
| Macao       | 62                         | 50,361,201,096        | $80,890                          | 9.10%                                 | 0.06%              |
| India       | 128193                     | $2,650,725,335,364    | $1,980                           | 6.68%                                 | 3.28%              |
| Nepal       | 2763                       | 24,880,266,905        | $900                             | 7.91%                                 | 0.03%              |
| Bhutan      | 74                         | 2,528,007,911         | $3,391                           | 4.63%                                 | 0.00%              |
| Pakistan    | 20790                      | 304,951,818,494       | $1,467                           | 5.70%                                 | 0.38%              |
| Bangladesh  | 15968                      | 249,723,862,487       | $1,564                           | 7.28%                                 | 0.31%              |
| Sri Lanka   | 2240                       | 87,357,205,923        | $4,135                           | 3.31%                                 | 0.11%              |
| Australia   | 2489                       | $1,323,421,072,479    | $53,831                          | 1.96%                                 | 1.64%              |
| New Zealand | 450.0                      | 204,139,049,909       | $43,145                          | 3.03%                                 | 0.25%              |
| USA         | 32508                      | 19,485,394,000,000    | $59,939                          | 2.27%                                 | 24.08%             |
| Canada      | 3673                       | 1,647,120,175,449     | $44,841                          | 3.05%                                 | 2.04%              |
| Mexico      | 12477                      | $1,150,887,823,404    | $9,224                           | 2.04%                                 | 1.42%              |

### 4.2 The niche of the Indo-Pacific Carbon Trading Common Market

#### 4.2.1 Demand analysis from the Kyoto Protocol’s restrictions on total carbon emissions worldwide

Total demand comes from the Kyoto Protocol's restrictions on total carbon emissions worldwide. This long-term limit on carbon emissions has forced companies to find the amount of emissions that can be allowed within this range. When the company requires the needs for new expansion, it has to look for tradable objects in the carbon trading market. At the same time, it has also created the development of the industry for carbon reduction technology development. Therefore, we must explore from more aspects.
Table 2 National Autonomous Decisions Asia Pacific Countries [7]

| Country     | Submission time | Mitigation target type | Quantitative target                                                                 |
|-------------|----------------|------------------------|-------------------------------------------------------------------------------------|
| China       | 2015.6.30      | Peak target            | Carbon dioxide peaks around 2030                                                    |
|             |                | Intensity target       | Carbon intensity is 60% to 65% lower than that in 2005                                |
| Japan       | 2015.7.17      | Absolute emission      | 20% lower than 2013 by 2030                                                          |
|             |                | reduction target       |                                                                                                |
| Korea       | 2015.6.30      | BAU drop target        | Greenhouse gas is 36% lower than BAU in 2030                                         |
| Brunei      | 2015.12.1      | BAU drop target        | Total energy consumption in 2035 was 63% lower than BAU;                              |
|             |                |                        | New energy accounts for 10% of power generation                                        |
| Cambodia    | 2015.9.30      | BAU drop target        | Greenhouse gas is 27% lower than BAU in 2030                                         |
| Indonesia   | 2015.9.24      | BAU drop target        | 2020 greenhouse gas is 26% lower than the BAU scenario,                                 |
|             |                |                        | 29% reduction in 2030 (conditional target 41%)                                        |
| Laos        | 2015.10.1      | Action measures        | –                                                                                     |
| Malaysia    | 2015.11.27     | Intensity target       | The greenhouse gas emission intensity in 2030 is reduced by 35% compared with 2005 (conditional target 45%) |
| Myanmar     | 2015.9.28      | Action measures        | –                                                                                     |
| Philippines | 2015.10.1      | BAU drop target        | 2030 greenhouse gas emissions are reduced by 70% compared to BAU                      |
| Singapore   | 2015.7.3       | Peak target            | Peaking around 2030                                                                  |
|             |                | Intensity target       | Emissions intensity is reduced by 36% compared to 2005                                 |
| Thailand    | 2015.10.1      | BAU drop target        | Greenhouse gas emissions in 2030 are 20% lower than the BAU scenario (conditional target 25%) |
| Vietnam     | 2015.9.30      | BAU drop target        | Greenhouse gas emissions in 2030 are 8% lower than the BAU scenario.                  |
|             |                | Carbon intensity       | Carbon intensity is reduced by 20% compared to 2010, and forest coverage is 45%        |
|             |                | reduction target       |                                                                                                |

4.2.2 Demand and opportunities in the financial industry

The new business is a potential profitable business model found in the increasingly booming carbon finance market. They are mainly divided into the following categories, as shown in Table 3.
| No. | Opportunity                        | Explanation                                                                                   |
|-----|------------------------------------|-----------------------------------------------------------------------------------------------|
| A   | Platform investment                | At present, there are many platforms in the carbon trading market. These platforms will become an important part of the future market structure. Equity investment in platform institutions is an important measure for the strategic layout of companies within the industry. |
| B   | Spot trading and innovative services | Controlling the quota between emissions companies and buyers, using buy-in options products can help control emissions companies to avoid economic losses caused by excessive quotas. |
| C   | Swap trading and arbitrage          | Interpolating transactions using the difference between each type of quota and emission reductions and regional quotas can provide investors with arbitrage space. |
| D   | Asset optimization management       | The self-developed energy product asset optimization management system, including the optimal combination of carbon quota assets, emission reduction assets, fuel, and energy output. In the context of the marketization of fuel prices and energy product prices, this emerging business will have a profound impact on all emissions companies. |
| E   | Pledge of carbon assets            | Carbon assets have the function of pledge financing. Exploring the possibility of pledge financing is a major breakthrough in seeking business innovation. At present, some financial institutions have already tried this business. This new asset can be used to build a new profit model when appropriate. |
| F   | Third party verification business   | Verification refers to the government's designation of a third-party verification agency with certain qualifications to calculate and verify the carbon emissions of the emission enterprises, so that the carbon emissions of the emission enterprises can be measured and verified to ensure the transparency and authority of their emissions. The company's carbon emission reduction lays the data foundation. (International Petroleum Economy, 201?) |
Table 4 Innovative traditional business of the energy industry

| Innovative service content                                      |
|-----------------------------------------------------------------|
| A  Carbon asset management                                      |
| B  Low-carbon planning for companies                            |
| C  Carbon inventory                                             |
| D  Enterprise quota declaration                                  |
| E  Construction of carbon emission information reporting and optimization system |
| F  Development of emission reductions                           |
| G  Carbon market analysis tool innovation                       |
| H  Trading and management of quotas and emission reductions      |
| I  Company carbon constraint analysis                           |
| J  Carbon market analysis                                       |

4.2.3 Energy industry needs
The energy industry under the carbon trading market is an innovative traditional business. It means that the business is based on the original business model, as shown in Table 4.

With the decline of the international carbon market and the rise of the domestic one, the original CDM project development has now become a voluntary emission reduction project development in China. The development of voluntary emission reduction projects in China includes the development of new projects, the development of emission reductions generated by the original CDM projects before registration, and the conversion of the original CDM projects into the development of domestic voluntary emission reduction projects.

4.2.4 Market forecast for industrial opportunities under carbon trading
Table 5 shows the future opportunities of the Indo-Pacific Common Market for carbon trading based on the economic factors of several carbon trading and the information on the activities collected Table 5 is the industrial opportunities arising from carbon trading in the Indo-Pacific Common Market.

4.3 SWOT analysis for Indo-Pacific Common Market
Table 6 is a SWOT analysis table for the Common Market of the Indo-Pacific Carbon Trading.

Table 5. Industrial opportunities under carbon trading

| Country | Industrial opportunity example                                                                 |
|---------|-------------------------------------------------------------------------------------------------|
| A       | Singapore Energy tax                                                                           |
| B       | Malaysia First National Emissions Test Center (NETC)                                           |
| C       | Cambodia Install a rural microgrid system fueled by renewable energy.                          |
| D       | Laos Conduct action plan teams, energy efficiency labeling standard policy advice.              |
| E       | Myanmar Share experience in sharing emission reduction policy plans, and capacity building to improve climate change |
| F       | Brunei Developing green technology                                                              |
| G       | Indonesia Developing green technology                                                            |
Table 6 SWOT analysis for Indo-Pacific Common Market

| S : Strength | W : Weakness |
|-------------|-------------|
| This market is now growing. | No historical market link |
| High population | Lack of financial support now. eg. No |
| Many countries | Carbon trading financial exchange |

| O : Opportunities | T : Threat |
|-------------------|------------|
| Global warming force every country cut down their emission. | Competition from the existing carbon exchange market. |
| There are a lot of existing carbon emission in some countries, which can be the target for carbon trading | For example |
| This area will be the next motivation for economic growth of the world | 1.EU |
| | 2.North American |
| | 3.China |

5. Conclusion

This paper uses the strategic planning method to conduct the feasibility analysis of the common market of the Indo-Pacific carbon trading. Forecast and analysis with SWOT and future trading volume. The results show that the Indo-Pacific Carbon Trading Common Market is a viable concept and deserves further implementation.

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