

Research on Risks of Clean Technologies Introduction Under CDM Mechanism

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Abstract

As the only flexible mechanism that involves in developing countries of the ‘Kyoto protocol’, CDM has received more and more attention. China is the largest supplier of CERs, and it’s significant to resolve ‘green dilemma’ by studying CDM introduction strategies .This paper, based on our predecessors’ achievements, analyzed the positions and interests of all subjects in CERs trading market. Meanwhile, it also studied the potential risks in the CDM projects in our country and put forward some solving strategies.

Key words: Clean development mechanism; Market; Risk; Strategy

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world have been affected in varying degrees, and they have been gaming and negotiating on this issue for a long time, finally adopted the “Kyoto Protocol”, an agreement which has landmark significance, at Tokyo in December 1997, and it created three pioneering flexible mechanisms, that is Emissions Trading, (ET), Joint Implementation (JI) and Clean Development Mechanism(CDM). Among these mechanisms, only the Clean Development Mechanism (CDM) provides a cooperation mechanism for developed and developing countries to collaborate internationally in reducing greenhouse gas emissions. The so-called CDM refers to the permission of Annex I group of countries in Kyoto Protocol by providing financial and technical support to implement greenhouse gas emission reduction projects in the Non-Annex I parties, thus obtains the Certification Emission Reduction (CER) and makes Appendix I parties comply with their promised binding emission reduction obligations in the Protocol.

However, clean technology that developed countries provide to developing ones consists of complex interests. Through the CDM, developing countries access to advanced clean technologies to improve production efficiency and promote sustainable development; But on the other hand, developing countries need to remain alert to developed countries which will utilize the ‘current’ efficiency and the capacity of emissions reduction to make them assume more, inconsistent emission reduction obligations, which is easy to get developing countries into a “duty expanded, technology relied, burden added” circular dilemma. Therefore, through researches on the introduction strategies of clean technologies to resolve potential difficulties of CDM mechanism, and make use of technical cooperation under the CDM to enhance China’s technological innovation and R & D capabilities which now seems to be urgent.

INTRODUCTION

Faced with the grim global warming, countries in the

1. RESEARCH STATUS AND THEORETICAL REFERENCE

CDM, as the only flexible mechanism which can contact developed and developing countries, has become one of the world's primary means of energy saving and been concerned by more and more scholars. Muller, A. Adrian^[1], a Swedish scholar, via his research of strategic behavior of developing countries, suggests that the developing countries are perhaps not interested in CDM projects when considering for their long-term interest, even if the reality proved that CDM mechanism has a positive effect for developing countries. Just as described by a German scholar Andreas Holzer^[2], CDM mechanism is the sole and the most effective market mechanisms which can change production mode with high energy consumption and emissions in developing countries. Notwithstanding, Emma Paulsson^[3] has pointed that most developing countries implement the CDM projects aiming at reducing the current production costs and chasing short-term interests, ignoring the long-term sustainable development.

On the other hand, domestic scholars Yang Hongqiang^[4] expressed fears that the attach importance only to short-term interests of developing countries, he contend that China should be cautious about the CDM mechanism based on market transactions; besides, Government should act as an important role in preventing our enterprise from short-term benefits into the long-term environmental stress caused by "Green dilemma." On these bases, Jin Yunhui, Liu Xue and Yang Wanhua^[5] analyzed the consistence between the short-term and the long-term effects of the introduction of technology to China's sustainable development goals; Zhang Kunmin, He Xueyang^[6] examined the potential opportunities and problems along with the implementation of the CDM, and discussed the implementation in China. Zheng Zhaoning, Pan Tao and Liu Deshun^[7] discussed how to use CDM to promote technology transfer, proposed to strengthen the technical digest and promotion and enhanced China's independent innovation capability. However, the literature above reflects a part or a certain Party of the CDM project, not the whole picture, thus we try to dissect the interests behavior of each player based on previous studies in CDM, analyze potential risk exists in the implementation of CDM project in our country and propose some solutions.

2. ANALYSIS OF THREE PARTIES (AS SHOWED IN FIGURE 1)

2.1 The Supply Party - Developing Countries Composed Mainly of China

In the CDM mechanism, on the one hand, developing countries due to economic backwardness and other

reasons, don't assume the corresponding emission reduction obligations in the Kyoto Protocol; On the other hand, because of their weakness of the industrial system and energy-saving technologies, result in inefficient use of resources and severe pollution. According to the prediction of International Energy Agency (IEA), the cumulative emissions of developing countries in the period 2008-2012 will reach 37850mtC (one million tons of carbon)^[6]. This will lay the foundation of a great deal of carbon trading in CDM mechanism.

2.2 The Demand Party - Developed Capitalist Countries Consist Mainly of European Union

Ruled in the protocol, developed countries undertake emission reduction obligations chiefly, because they have strong economic strength and emission reduction technological advantages, they get the upper hand in reducing emissions. However, they have been adopted fairly advanced energy saving technology during the industrialization, which makes the cost of further emission reductions increased significantly in the case of resources, are fully utilized, while under the same circumstances, the marginal cost of emission reduction in developing countries is pretty little. This prepared the ground of the demand party in CDM project. CDM projects are seemingly that developed countries provide technology and capital to developing countries to help them, However, as a result of game, the developed countries in the process can both fulfill their emission reduction commitments (also disguised lower their costs and increase profit margins), and expand their channels of technology and product to increase market share, gain greater profits.

2.3 The Third Party - International Emissions Trading Market Dominated by Developed Countries

With the carbon supply of developing countries which composed mainly of China, and the carbon demand in developed countries which mainly consist of EU, the implementation of the project also needs emissions trading market as a platform to make the connection. The cost of CER in developing countries is \$5-15/MT, while it is \$256/MT in developed countries. According to the report (September 1998) of the U.S. "Pacific Northwest National Laboratory", the cost is \$26/MT^[8] when CER trades freely worldwide, hence, carbon emissions trading will have a huge market. However, developed countries dominate the international emissions trading market using the advantages of buyer's market at this stage, making the transaction has the potential unfairness.

3 POTENTIAL RISKS AND STRATEGIC ANALYSIS ALONG WITH IMPLEMENTING CDM IN CHINA

3.1 The Necessity of the Introduction of CDM

China as the largest developing country, although its per capita emission is low, the total annual emissions are more than 10% of the global, ranked after the United States, and is most likely to surpass the United States in global emissions between 2010 and 2020^[6]. Despite there is not need to undertake emission reduction obligations now, but in the future, especially in the upcoming a new round negotiations in 2012 “Kyoto Protocol”, China will face intense international pressure, furthermore, it may become the excuse that United States and other developed countries do not fulfill obligations of reducing emissions.

In addition, as the largest supplier of the CDM projects, China needs to think seriously how to make better use of the CDM market mechanism now, which has no pressure to cut emissions, to promote technological progress and optimize industrial structure. China can take advantage of its status as the largest supplier, employing the CDM appropriately on an equitable basis to gain capital and technology, achieve technology absorption and innovation, and reduce energy consumption and pollution, to realize the goal of sustainable development. Therefore, China should seize this opportunity to actively participate in CDM projects and promote a new round of economic growth. Table one was the prediction of China’s market share of CDM in 2010.

Table 1
The Market Size of CDM and China’s Market Share in 2010 (Estimation from Ed Simmons, etc.)^[9]

Country or region	CDM market size (MMTCe)	The share of countries or regions (%)
China	341	75.1
India	37	8.1
Korea	3	0.7
Mexico	19	4.2
Rest of the world	54	11.9
Total	454	100

3.2 The Potential Risk of the Implementation of CDM Projects in China

Through the analysis above, we know that the participants in the market mechanism are all economic man, maximizing the benefits as their target. CDM as the result of game, it seems to be beneficial to developing countries in the short term, especially China, but in the long run, then there exists a variety of potential risks.

3.2.1 In the Short Term: A Single Buyer

Because the United States has not ratified the Kyoto Protocol, EU was the biggest buyer of CDM projects, viewed from the implementation of the CDM project. Its trading volume accounted for more than 75% since 2002. The circumstance of “single buyer” is extremely risk to the largest seller--China. Since in the project process, the pre-investment of CDM projects has been provided by China (the seller), the buyer pay in the end of the process.

This means once the largest partners--EU stops the CDM trade, the whole market will collapse, and the investment of projects started is very difficult to recover, China will suffer huge losses. As depicted in figure 2.

3.2.2 In the Short Term: The Passiveness of Deal Price

The deal price of CERs is significantly low in China, only is 5-8 euro / ton, while the international price is 13-14 euro / ton, and sometimes up to 25 U.S. dollars / ton^[10]. This is because the developed capitalist countries dominate in the CDM project, with strong capital and technology, so they can maximize profits by screening and developing the CDM projects, and also have the actual power to price. On the other hand, the trading market information is unenlightened and asymmetric information is existed in developing countries (China), generating passive and low price.

3.2.3 In the Long Run: the Impetus Declined in Active Emission Reduction

First of all, in the project, developed countries provide energy saving technologies and equipments which are at reserve price or even free, making corporations in developing countries use their technology to product, and lost their desire to spend the cost to research and development, which will increase the dependence of Chinese CDM joint venture on developed countries’ technology and equipment. Secondly, in the progress of actual CDM project implementation, developed countries hardly afford the core technology, most of them only provide equipment or funds. Due to technical limitations, China is unable to supply a similar device, so it needs to import from developed countries. By and by, there will be a gap among the abatement equipment market, and the motivation of active reduction will be declined. After the project ended, China has to buy emission reduction facilities from developed countries at high prices, restricting China’s economic development.

3.2.4 In the Long Run: the Loss of Future Benefits

As a big developing country, China needs to guard against emission reduction pressure that developed countries impose in the future. In the new round negotiation, China is likely to be required to perform emission reduction obligations. Because China is a big carbon emissions country, and through the technical cooperation in CDM projects, China is easy to accomplish the reduction, so this will be the excuse required to perform duties. If China does not agree to perform, it will be subject to international condemnation and punishment, which reflected in international trade; On the contrary, the absence of a corresponding advanced technology, China has to resort to developed countries buy at high prices. This will increase the cost of China’s economic development, and be most likely subject to the developed countries.

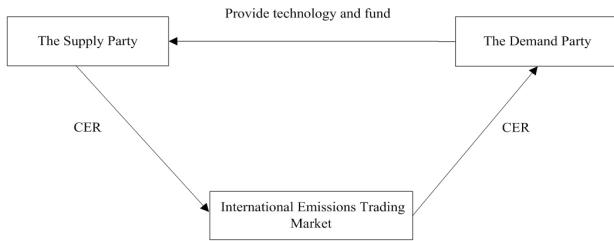


Figure1
Analysis of Three Parties

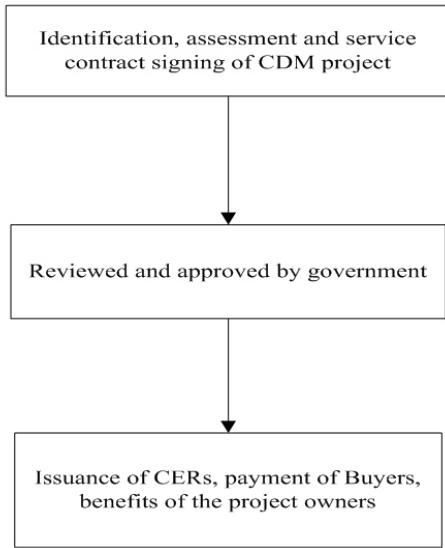


Figure2
Brief Procedures of CDM Project

3.3 Strategies to Cope with Risk

To minimize the risk, China needs to take the initiative from existing strengths in the implementation of the CDM project, notices the application of strategy, nip the risk in the bud. From the analysis of the risk above, the situation of a single buyer (as a seller) cannot be controlled, moreover, due to the international public opinion and their own economic development, Obama is very concerned about environment protection and energy. He says the U.S. will earnestly implement greenhouse gas emission reduction obligations and join the CDM project market. So, we are starting from China's initiative to analyze strategies of the risk.

3.3.1 Establish an International Emissions Trading Market

Transactional price is the result of the game between buyers and sellers. At present, in the international market, the trading price of CERs is only 13-14 euro / ton, the emission reduction cost of Western countries is 146 euro/ton, and there exists obvious imbalance. China, as the project's main stakeholders, can utilize the advantage as the largest suppliers of CERs and the broad market prospects to actively establish an international carbon

emissions trading market. Currently, China's first large-scale carbon trading summit held in Shanghai in April 2008; In September, China's first national emissions trading market also set up in Tianjin. Furthermore, investment banks and carbon funds from UK, Germany, Italy, the Netherlands, Japan and other countries established their agency in China.^[11]

3.3.2 Technical Introduction, Absorption and Innovation

In the project, the main body is the industrial and commercial enterprises; they aim at profit, unable to care the high costs of the introduction, absorption and innovation of technology, thus requires government's support. Through the risk analysis above, we know that CDM not only correlate with the environment but also with a country's future economic development, and the key is to master the clean technology. Since the company may not afford the fare of clean technology, government should have the consciousness to cultivate talents of clean technology, and provide favorable conditions to promote the development of emission reduction. But how to use the advantages of the project to introduce high-level cleaning technology, making our country not be subject to the developed countries in this regard in the future, which will be described in another paper.

3.3.3 Participating Actively in International Climate^[10] and Training First-Class Negotiator

Both the carbon emission obligations that fulfilled by countries and the rights of allocation of emissions are gained by gaming and negotiating in the Global Climate Change Conference. There is a big challenge in the emission reduction targets and obligations between developed and developing countries because of different economic interests and specific condition. Under the principle 'common but differentiated responsibilities', developed countries bear a certain amount of obligation, which inevitably had an impact on their economy. In contrast, China was exerted a lot of pressure by so many countries, especially the developed countries, in the global climate change conference. Therefore, China should participate actively in international climate negotiations, take part positively in the enactment of international climate rules and train high-quality negotiator, making the international climate negotiation is favorable to the interests of China.

CONCLUSION

Clean Development Mechanism (CDM) is a win-win and innovative mechanisms for developed and developing countries, whether to achieve sustainable development in developing countries or to complete the task of emission reduction in developed countries. China, as the largest greenhouse gas emissions country and the biggest developing country in the world, faces opportunities

and risks equally. Although some scholars have already seen the ‘green dilemma’ in the implementation of CDM projects from the technical viewpoint, it seems not to integrate CDM into a collectively analytical framework. Therefore, we must look at the interests the project bring to our country dialectically, study the role and interests of all participants. At the same time, China should face the potential risks, learn the correct treatment of risks and evade them. CDM project is a trend of clean production in line with the tide of historical development. If China grasps this good opportunities of international cooperation in CDM, the goal will be realized that accelerate the development of clean technology and innovation and enhance China’s sustainable development.

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