

# How Do Clean Development Mechanism Projects Contribute to Sustainable Development in China: An Assessment of the Performance of the CDM in China

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## *Editors' Summary*

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The Clean Development Mechanism under the Kyoto Protocol has been in place in China for several years, and today, China exists as the global center of CDM project development. Although the CDM has brought and is expected to bring considerable benefits to China, its limited and in some cases negative impacts may affect China's sustainable development in the long run. Moreover, as the first Kyoto period is set to expire in 2012, the climate legal regime and the CDM are likely to be changed. The limitations of the CDM in promoting sustainable development in China beyond 2012 could be addressed by setting up clear sustainable development standards, effective management of the CDM, and legal strategies for emission reductions.

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Global warming has been described as one of the greatest challenges for the 21st century.<sup>1</sup> The international community has been working together to combat global warming through the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and its innovative 1997 Kyoto Protocol. The Kyoto Protocol, for the first time, set legally binding Quantified Emissions Limitation and Reduction Objectives (QELROs) for industrialized countries' (Annex I Parties) anthropogenic emission by source, and removal by sinks, of greenhouse gases (GHGs) during the commitment period 2008-2012.<sup>2</sup> However, the most innovative aspect of the Protocol may in fact not be these strict commitments, but the introduction of the three market-based mechanisms.

The Clean Development Mechanism (CDM), which is the object of this study, is a flexibility mechanism defined in Article 12 of the Kyoto Protocol designed to help Annex I countries achieve their emission reductions targets within the Kyoto Protocol. As the only one among the three Kyoto mechanisms open to Contracting Parties classified as industrialized countries and developing countries, the CDM allows industrialized countries to achieve a portion of the required emission reductions through providing financial assistance or clean technology transfer in emission-abatement projects undertaken in countries without emission targets, while the latter may define the conditions in which these projects take place. It was designed with the dual aim of helping developing countries in achieving sustainable development and of assisting industrialized countries in achieving compliance with their GHG emission reductions.

Operational since the beginning of 2006, the CDM has been widely carried out. To date, over 2,000 CDM projects have been registered and Certified Emission Reductions (CERs) amounting to more than 2.7 billion tons of carbon dioxide (CO<sub>2</sub>) equivalent are anticipated to be produced in the first commitment period of the Kyoto Protocol, 2008-2012.<sup>3</sup> China, in particular, with its large carbon emission potential and favorable investment environment, has dominated the CDM and has become the largest beneficiary.

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1. See, e.g., KEVIN WATKINS ET AL., UNITED NATIONS DEVELOPMENT PROGRAMME, HUMAN DEVELOPMENT REPORT OF 2007/08: FIGHTING CLIMATE CHANGE: HUMAN SOLIDARITY IN A DIVIDED WORLD (2007), available at <http://hdr.undp.org/en/reports/global/hdr2007-2008>.
  2. Removal by sinks means removing carbon dioxide (CO<sub>2</sub>) from the atmosphere, which could include the sequestering of carbon by land use, land-use change, or forestry (LULUCF). According to the Kyoto Protocol, industrialized countries (Annex I Parties) are assigned legally binding reduction targets for GHG emissions by an average of 5.2% below 1990 levels during the first commitment period (2008-2012), while developing countries (non-Annex I Parties), whose paramount task at the present stage is economic development and poverty eradication, are free of legally binding emissions obligations during this period.
  3. UNFCCC website, <http://cdm.unfccc.int/about/index.html> (last visited Feb. 3, 2011).

With the booming of CDM projects, the issue of how the CDM contributes to sustainable development in developing countries has become a hotly debated topic worldwide. A main conclusion made by the relevant literature reveals that there is growing concern that a significant part of the CDM credits does not reflect real emission reductions, and that the mechanism is inadequate to assist developing countries in their transition toward a low-carbon economy.<sup>4</sup> In spite of the overwhelming criticism on the potential flaws of the CDM to contribute to sustainable development in developing countries, there is a dearth of literature that seriously or thoroughly explores the sustainable development issues of the CDM from China's perspective. Accordingly, this study intends to address this gap and contribute to the current discussion by exploring the application of the concept of sustainable development in terms of the CDM in the context of China.

In addition, as the first phase of the Kyoto Protocol is set to expire in 2012, the international climate change regime will likely be changed in the post-2012 period. China, as a major GHG emitter and developing country, will play an indispensable and crucial role in combating global warming in the post-2012 period. It is expected to take on more reduction responsibilities, and thus will be under considerable pressure to reduce carbon emissions without undermining its economic development. Against this background, in spite of the Chinese dominance in the CDM, the CDM has become one of the most significant subjects under the post-2012 negotiations, due to the current questions about its performance. Any decision to maintain the CDM in its current form within a post-2012 climate agreement has to be considered with great care.<sup>5</sup> Therefore, it is important to discuss how the CDM could assist in promoting sustainable development and meet the challenge of climate change in the post-2012 period by analyzing its prospects.

Based on the above introduction, this Article aims to explore how the CDM contributes to sustainable development in China. Part One discusses sustainable development and its application in the CDM. The potential flaws of the CDM to contribute to sustainable development are critically analyzed, based on the concept of sustainable

development and the CDM project cycle. Part Two assesses the performance of the CDM on promoting sustainable development in China based on the introduction to China's national circumstances and critique of policy and legal initiative undertaken by the Chinese government to ensure sustainable development of projects. Part Three focuses on the CDM in the post-2012 period. The last part draws a conclusion and puts forward suggestions on how to deal with the limitations of the CDM in promoting sustainable development in China.

## I. Sustainable Development and Its Implication in the CDM

### A. *The Basic Concept of Sustainable Development and the CDM*

The term sustainable development originally came from the World Commission on Environment and Development 1987 Brundtland Report: *Our Common Future*, which addresses the problem of conflicts between environment and development goals. The most frequently quoted concept of sustainable development is "the development which meets the needs of the present without compromising the ability of future generations to meet their own needs."<sup>6</sup>

Sustainable development has been established as a significant principle in international environmental law. Article 3(4) of the UNFCCC clearly set out that "[t]he Parties have a right to, and should promote sustainable development."<sup>7</sup> The CDM is also designed with sustainable development in mind—GHG reductions projects must assist in promoting sustainable development and bring about emission reductions. In spite of the fact that CDM projects have been implemented with the object of sustainable development for many years, there are no international protocols that assess the sustainable development benefits achieved through the CDM. According to Decision 17/CP.7 for Article 12 of the Kyoto Protocol, "it is the host Party's prerogative to confirm whether a clean development mechanism project activity assists it in achieving sustainable development."<sup>8</sup> However, the U.N. 2005 World Summit Outcome Document refers to the "interdependent and mutually reinforcing pillars" of sustainable develop-

4. See, e.g., Joëlle de Sépibus, *The Environmental Integrity of the CDM Mechanism—A Legal Analysis of Its Institutional and Procedural Shortcomings*, Working Paper No. 2009/24, NCCR Trade Regulation (2009), available at [http://82.220.2.60/images/stories/research/header\\_ip6/environmental%20integrity%20CDM.pdf](http://82.220.2.60/images/stories/research/header_ip6/environmental%20integrity%20CDM.pdf); Michael Wara & David G. Victor, *A Realistic Policy on International Carbon Offsets*, Program on Energy and Sustainable Development Working Paper 74, Stanford Univ. (April 2008); LAMBERT SCHNEIDER, *IS THE CDM FULFILLING ITS ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT OBJECTIVES? AN EVALUATION OF THE CDM AND OPTIONS FOR IMPROVEMENT* (2007).

5. See Sépibus, *The Environmental Integrity of the CDM Mechanism*, *supra* note 4.

6. REPORT OF THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT: *OUR COMMON FUTURE* (1987).

7. United Nations Framework Convention on Climate Change (UNFCCC), May 29, 1992, U.N. Doc. A/AC.237/18 (1992), reprinted in 31 I.L.M. 849 (1992) (available in ELR STAT. 50343).

8. Modalities and Procedures for a Clean Development Mechanism as defined in Article 12 of the Kyoto Protocol, Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, U.N. Doc. FCCC/CP/197/L. 7/Add. 1, art. 3.1 & Annex B, reprinted in 37 I.L.M. 22 (1998).

ment as economic development, social development, and environmental protection.<sup>9</sup> Hence, it is generally accepted that the CDM project activities are assessed based on economic, environmental, and social aspects.<sup>10</sup>

As a matter of fact, there is a wealth of literature available on the discussions of linkages between sustainable development and the CDM.<sup>11</sup> Although there are no universally recognized sustainable development criteria, most of the literature expresses the concern that the CDM has institutional and procedural shortcomings, particularly regarding additionality, to safeguarding environmental integrity and sustainable development.<sup>12</sup> The next two parts will explore the potential flaws of the CDM to contribute to sustainable development.

## B. The CDM Project Cycle

Because the CDM is an emerging market-based legal cooperation mechanism, transparency and clearly defined rules are needed to ensure its continuing acceptance and workability. Article 12 of the Kyoto Protocol sets out the basic provisions of the CDM, but left out many details of its operation. These details were completed by the Marrakesh Accords, which laid down the principal modalities and procedures of the CDM.<sup>13</sup>

The requirements and operational rules of the CDM projects are extremely complex and detailed. The first step of undertaking a CDM project is to design a project. A project developer should complete a project design document (PDD) in accordance with the requirements set up by the CDM Executive Board (EB).<sup>14</sup> The PDD must demonstrate that the project will generate reductions in emissions that in addition to those that would have occurred under a business-as-usual scenario, which is the so-called additionality.<sup>15</sup> Moreover, the PDD must include stakeholder

comments and an analysis of environmental impacts to make sure that local stakeholders participate in the process of designing the project.

In order to be considered for registration, a project must first be approved by the host country and get the validation of the PDD by a third independent Designated Operational Entity (DOE).<sup>16</sup> Following this, the project developer may request registration by the CDM EB.

Once the project activity has been registered, the participants can operate the project and meanwhile monitor emissions during the crediting period in accordance with the monitoring plan contained in the registered PDD. Then, the DOE verifies the project monitoring activities and certifies the amount of reduced emissions. Following this, the participants may request the issuance of CERs by the CDM EB. These CERs can be traded and sold, and used by industrialized countries to meet a part of their emission-reduction targets under the Kyoto Protocol.

## C. Institutional and Procedural Shortcomings of the CDM to Contribute to Sustainable Development

Despite rapid development of the CDM, the mechanism is not a panacea for efficient global warming mitigation. As mentioned earlier, it is not an easy task to implement CDM projects, as there is an intricate regulatory system that ensures the project quality. Hence, CDM developers have to undergo a complex and time-consuming procedure to develop a CDM project. Consequently, many potential problems may be incurred by the operational rules of the CDM.

### I. The Additionality of a CDM Project

There is a growing concern that a significant part of the CDM credits does not reflect real emission reductions. There are many reasons for concern leading to this problem.

First, the additionality standard is not objective and is hard to validate. In order to explain how and why a project's activity is additional, it is necessary for project participants to identify baseline scenarios in accordance with the selected baseline methodology. The problem of determining a baseline scenario for a CDM project is that the situa-

9. World Health Organization (WHO), 2005 World Summit Outcome Document, art. 48 (Sept. 15, 2005), available at <http://www.who.int/hiv/universalaccess2010/worldsummit.pdf>.

10. For example, in order to implement a CDM project in India, the potential project must meet three criteria regarding additionality, sustainable development, and emissions baseline to get approval. The sustainable development indicator includes social well-being, economic well-being, and environmental well-being.

11. *Supra* note 4.

12. See, e.g., Sépibus, *supra* note 4.

13. See Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol [hereinafter Report of the COP], 1st sess., UN Doc. FCCC/KP/CMP/2005/8/Add.1, 7-8, (2005), available at <http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf>.

14. The PDD shall include descriptions of the project activity itself and the application and justification of a proposal baseline methodology, a statement of the estimated operational lifetime of the project and the selected crediting period, stakeholder comments and an analysis of environmental impacts, a demonstration of sources of public funding for the project and an explanation of how the additionality requirements will be met, how the emission reductions will be monitored by drawing up monitoring plan, and how to calculate the reduced emissions and project leakage. *Id.* app. B.

15. A CDM project activity is additional if anthropogenic emissions of GHGs by sources are reduced below those that would have occurred in the absence of the registered CDM project activity. However, the additionality assessment process is complex and technical. In order to explain how and why the project activity is additional, it is necessary for project participants to identify baseline scenarios in accordance with the selected baseline methodology. The baseline for a CDM project activity is the scenario that rea-

sonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed project activity. The difference between the baseline emissions and project emissions (GHG emissions after implementing the CDM project activity) is emission reductions. The Marrakesh Accords set out some guidance on how to calculate baseline emissions. A baseline shall be calculated by project participants in accordance with approved methodologies, which are publicly available on the UNFCCC CDM website or new methodologies, which need the approval by the EB prior to a submission for registration of this project activity. Besides, project participants should take into account their national policies and circumstances when establishing a baseline and choosing a baseline methodology. For details, see Draft Decision -/CMP.1 (Article 12), *Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol, The Marrakesh Accords & The Marrakesh Declaration*, 43-8, available at [http://unfccc.int/cop7/documents/accords\\_draft.pdf](http://unfccc.int/cop7/documents/accords_draft.pdf) (last visited Feb. 3, 2011).

16. See Report of the COP, *supra* note 13, at Decision 3/CMP.1, ¶ 26.

tion it describes will never exist because of the project.<sup>17</sup> In other words, a baseline scenario for a CDM project activity is a hypothetical reference case that cannot be monitored and verified.<sup>18</sup> Hence, numerous projects that would have been implemented regardless of the CDM have become beneficiaries of the system.

Moreover, one of the most problematic issues to arise so far with respect to the establishment of baselines is related to ¶ 45(e) of the CDM rules, which requires that project proponents must take into account national and/or sectoral policies and circumstances.<sup>19</sup> The concern this requirement raised was that it had a deterrent effect on the implementation of legislation addressing climate change. Many developing countries became reluctant to implement climate-friendly policies for fear that fewer projects would be hosted in their countries. Indeed, if a country decided to pass a law encouraging renewable energy sources through the grant of preferential electricity tariffs, it ran the risk that such projects would become the “economically most attractive course of action” and therefore ineligible for the CDM.<sup>20</sup>

Second, the danger that the CDM leads to “false” emission reductions is significant, as all parties to a CDM transaction have an interest in demonstrating the additionality of a project and in inflating the level of emission reductions of a project.<sup>21</sup> Possible fraud by companies in the developing countries may turn up under the current CDM application and operation system. Despite the complex regulatory framework, there is both the incentive and the opportunity for project developers to distort key information to make a project appear more effective. Distorted projects would earn more CDM credit to trade with industrialized countries looking to meet their Kyoto Protocol emission targets.<sup>22</sup> There is virtually no way to determine which projects are genuine reductions, and which are not.<sup>23</sup>

In the meantime, the bureaucratic procedure of managing CDM projects may produce corruption. Implementation of the CDM involves both international and domestic processes. Under the international process, the EB is given

a regulatory and supervisory role, while domestic governments have the responsibility of approving CDM projects in their countries by applying their own sustainable development standards. Although the CDM provides for the participation of the public and contains rules on transparency, the decisionmaking process, in particular the highly influential expert panels, remains opaque.<sup>24</sup> In this scenario, even if the CDM has rigid supervisory rules, there is also a possibility that corruption might occur.

In addition, the CDM project verification process carried out by the third-party DOE has its problems. With the increase of CDM projects, the problems of understaffing and asymmetrical information are compounded in the CDM EB. As a result, the CDM system relies on verifiers to validate the claims of the project developers. In practice, the verifiers, who are paid by the project developers, have strong incentives to approve the projects they check.<sup>25</sup> A leading expert, Axel Michaelowa, acknowledges that with growing competition, DOEs have increasingly entrusted tasks to employees hired recently and trained in a hurry, while more experienced employees tend to work in a more superficial way, due to increased workloads and time pressures.<sup>26</sup> Further, there is scant oversight of the integrity of the verification process, and no record of punishing verifiers for misconduct.<sup>27</sup> In this case, the verification of the CDM project lacks objectivity and equality.

## 2. Other Shortcomings of a CDM Project Design

First, investors and financiers may suffer high transaction costs as a result of the CDM's time-consuming approval process and its ongoing reduction emissions monitoring. These costs do not only include the fees to implement the project, but also go through the long process of accreditation and certification, with all the attendant expenses of carbon consultants, third-party verifiers, and so forth. Thus, this factor would deter businesses from taking part in CDM projects. Yet, this problem is even worse for the potential small-scale companies in developing countries, as the transaction cost is generally similar regardless of project size. Large, high-carbon credits-volume projects can pay off their investment costs quickly, while the ones with smaller credit volumes would be more vulnerable. Therefore, many

17. Sépibus, *supra* note 4, at 6.

18. *Id.*

19. Report of the COP, *supra* note 13, at Decision 3/CMP.1, ¶ 45(e).

20. Sépibus, *supra* note 4, at 9.

21. *Id.* at 5 n.26. Flues et al. show in their study about the political economy of the CDM that the majority of actors involved in the mechanism have an interest in highlighting its benefits: the host country of a project country, because it generates financial flows for its country, the buyer country, because it limits its commitments under the Kyoto Protocol, the designers of the CDM, as they have conceived it, the project developer, the verifiers of the projects, and several international organizations, like the World Bank, which all have important financial stakes in its development. See Florenz Flues et al., *UN Approval of Greenhouse Gas Emission Reduction Projects in Developing Countries: The Political Economy of the CDM Executive Board*, Univ. of Zurich and Center for International and Comparative Studies (CIS), Zurich (2008); Ernestine Meijer & Jacob Werksman, *Keeping It Clean—Safeguarding the Environmental Integrity of the Clean Development Mechanism*, in David Freestone & Charlotte Streck (eds.), *LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS: MAKING KYOTO WORK* (2005).

22. David Victor, *Life After Kyoto*, Speech at the UCLA International Inst. (Feb. 1, 2001).

23. *Id.*

24. See Sépibus, *supra* note 4, at 22 n.135. Experts and nongovernmental organizations have repeatedly underlined that project developers have provided scant attention to the comments of stakeholders, and criticism has remained largely unheard. See also Patrick McCully, *The Great Offset Swindle: How Carbon Credits Are Gutting the Kyoto Protocol, and Why They Must Be Scrapped*, in LORI POTTINGER, *BAD DEAL FOR THE PLANET: WHY CARBON OFFSETS AREN'T WORKING . . . AND HOW TO CREATE A FAIR GLOBAL CLIMATE ACCORD, DAMS, RIVERS AND PEOPLE REPORT 2008 2-14* (International Rivers, Berkeley, Cal. 2008).

25. Michael W. Wara & David G. Victor, *A Realistic Policy on International Carbon Offset* 14 (Program on Energy and Sustainable Development Working Paper No 74, Stanford Univ., 2008).

26. Sépibus, *supra* note 4, at 14; see also Axel Michaelowa, *Le Mécanisme de Développement Propre Nait-Il à la Protection Internationale du Climat?*, 9 *REVUE DE POLITIQUE ÉCONOMIQUE* 20, 22 (2007).

27. Wara & Victor, *supra* note 25.

smaller but still environmentally beneficial projects would be excluded from entering the scheme.

Second, delays and inefficiencies along the project cycle exist as a result of the long-term and detailed regulatory process, leading to higher transaction costs, loss in CER volumes, and lower market values. Furthermore, overload of the EB can occur as more and more eligible developers begin to undertake CDM projects. Consequently, a large number of potential projects in the pipeline must sit idle as they await registration.<sup>28</sup>

Third, stakeholder comments are one of the sustainable development aspects that the CDM projects contribute to host countries. In order to safeguard environmental integrity, a project developer must make sure that local stakeholders participate in the process of designing the project, and the report of stakeholder consultation should be made public. However, there are no internationally recognized requirements for ensuring good-quality stakeholder consultation processes in CDM projects, apart from voluntary certification schemes, such as the CDM Gold Standard.<sup>29</sup> In line with national sovereignty considerations, it is up to each host country to establish its own requirements for stakeholder consultation.<sup>30</sup> Some countries may not do so at all, leaving it up to the project developer to decide in which manner they invite stakeholders to participate.<sup>31</sup> Therefore, whether the stakeholder consultation process could fulfill the objective of safeguarding environmental integrity is another issue.

## II. Assessment of the Contribution of the CDM to Sustainable Development in China

China takes an overwhelming lead in the development of the CDM: it has not only had the most registered CDM projects and largest amount of issued CERs, but also is expected to generate more than one-half the amount of total expected CERs. As of February 3, 2011, China had 1,200 registered CDM projects, accounting for 42.8% worldwide, and issued 300,483,566 tons of CERs, accounting for 55% of worldwide CERs.<sup>32</sup> Moreover, the expected average annual CERs from registered project activities by

China accounts for 63%.<sup>33</sup> Accordingly, it can be said that China has dominated the CDM regime and is expected to exert greater influence on the CDM in the future. Given the crucial role China plays in mitigating global warming, this part discusses the contribution of the CDM to sustainable development, starting with an introduction to China's basic national circumstances with regard to climate change and a critique of policy and legal initiative undertaken by the Chinese government.

### A. China's Basic National Circumstances With Regard to Climate Change

#### I. Physical Features and Administrative Divisions

China, located in eastern Asia on the western shores of the Pacific Ocean, is the third largest country in the world by area after Russia and Canada, with 9.6 million square kilometers in total. China's coasts are on the East China Sea, Korea Bay, Yellow Sea, and South China Sea. The country has a continental coastline extending over 18,000 kilometers and an adjacent sea area of 4.73 million square kilometers.<sup>34</sup>

The terrain of China contains a large variety of landscapes. In the East, there are extensive and densely populated alluvial plains, while in the North, grasslands dominate the landscape. China's grassland area for 2005 was 400 million hectares, most of which are high-cold prairie and desert steppes, while the temperate grasslands in northern China are on the verge of degradation and desertification, because of drought and environmental deterioration.<sup>35</sup> Southern China is dominated by hill country and low mountain ranges. The central East possesses the deltas of China's two major rivers, the Yellow River and Yangtze River (Chang Jiang). The western part of China mostly consists of mountains, notably the Himalayas, high plateaus, and deserts.

China has administrative control over 23 provinces, including Taiwan Province. There are also five autonomous regions, which have traditionally been referred to as Outer China, because they are located beyond the Great Wall of China, four municipalities, including Beijing (Capital of China), Shanghai, Chongqing, and Tianjin, and two Special Administrative Regions that enjoy considerable autonomy.

28. Over 2,000 projects have been approved by the Chinese DNA and are awaiting the EB's registration. For details, see Clean Development Mechanism in China website, [http://cdm.ccchina.gov.cn/english/item\\_data.asp?ColumnId=69](http://cdm.ccchina.gov.cn/english/item_data.asp?ColumnId=69) (last visited Feb. 3, 2011).

29. PAULA CASTRO & ALEX MICHAELOWA, *EMPIRICAL ANALYSIS OF PERFORMANCE OF CDM PROJECTS, CLIMATE STRATEGIES REPORT, POLITICAL ECONOMY AND DEVELOPMENT 8* (Inst. of Political Science, Univ. of Zurich, 2008). Currently, only four registered CDM projects are officially acknowledged as Gold Standard. Information is not complete as to how many projects are requesting registration as Gold Standard, but there are at least 12 in this process. CDM Gold Standard website, <http://www.cdmgoldstandard.org/projects.php> (last visited Feb. 3, 2011).

30. *Id.*

31. *Id.*

32. UNFCCC, CDM Statistics, <http://cdm.unfccc.int/Statistics/index.html> (last visited Feb. 3, 2011).

33. UNFCCC, CDM Statistics, expected average annual CERs from registered projects by host party, <http://cdm.unfccc.int/Statistics/Registration/AmountOfReductRegisteredProjPieChart.html> (last visited Feb. 3, 2011).

34. NATIONAL DEVELOPMENT AND REFORM COMMISSION, PEOPLE'S REPUBLIC OF CHINA, *CHINA'S NATIONAL CLIMATE CHANGE PROGRAMME 15* (2007), available at <http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/File188.pdf> (last visited Feb. 3, 2011).

35. *Id.*

## 2. Population

China has the largest population in the world. In 2005, the population of China's mainland was 1.31 billion, accounting for 20.4% of the world's population.<sup>36</sup>

Along with industrialization, an urbanization movement is taking place in China: the urban population accounted for only 26.4% in 1990, and increased to 43% in 2005.<sup>37</sup> However, China is still at a low level of urbanization, with 750 million people living in rural areas, and urban population accounting for 43% of the national population, which is lower than the world average.<sup>38</sup>

Consequently, huge population and urbanization movements bring about huge employment pressure for China, with annually more than 10 million new workers in urban areas.<sup>39</sup>

## 3. Economic Development

China's economy has been developing rapidly since the Reform and Opening Up Policy,<sup>40</sup> which was proposed by Xiaoping Deng in 1978. As a consequence, living standards in China have been improved dramatically. Although great economic changes have taken place, China is currently at a relatively low level of economic development. In 2005, the per capita gross domestic product (GDP) of China was about US \$1,714 (based on the exchange rate of the same year), only about one-fourth of the world average.<sup>41</sup>

Remarkable disparity in economic development exists among different regions of China. In 2005, the per capita GDP of the eastern areas of China was US \$2,877, while that of the western areas was US \$1,136, only 39.5 % of the former. Especially, Shanghai in the eastern areas is experiencing fast economic development. According to international standards on statistics, the per capita GDP in Shanghai in 2006 was over US \$7,000.<sup>42</sup>

The income disparity between rural and urban residents is also great. In 2005, the per capita disposable income of the urban residents was US \$1,281, while that of the rural residents was only US \$397, equivalent to 31.0% of the former.<sup>43</sup> Furthermore, poverty eradication is still a huge challenge for China. By the end of 2005, the poverty-stricken people in China's rural areas numbered 23.65 million, with the per capita annual pure income less than 683 Chinese Yuan (less than US \$100).<sup>44</sup>

36. *Id.*

37. *Id.*

38. The data was issued in 2001. *See* Chinese Cities and Provinces Information and Links, A China Information Base, *available at* <http://www.chinatoday.com/city/a.htm> (last visited Feb. 3, 2011).

39. *Supra* note 35, at 15.

40. The economy has changed from a centrally planned system that is under a rigid political control to a more market-oriented economy that has a rapidly growing private sector and is a major player in the global economy.

41. *Supra* note 35, at 16.

42. This is according to the news conference held by the Information Office of Shanghai Municipal Government on February 7, 2007.

43. *Supra* note 35, 16.

44. *Id.*

## 4. Climatic Conditions

The climate of China is extremely diverse, with tropical areas in the South, to subarctic areas in the North, owing to China's extensive territory and complex topography. The northern zone (containing Beijing) has summer daytime temperatures of more than 30 degrees Celsius and winters of arctic severity, with the lowest temperature of minus 30 degrees Celsius in northernmost Heilongjiang Province. The central zone (containing Shanghai) has a temperate continental climate, with very hot summer and cold winter. There are also the famous Three Ovens cities along the Yangtze River in summer: Chongqing, Wuhan, and Nanjing. The summer temperature in these cities may reach up to 40 degrees Celsius. The southern zone (containing Guangzhou) has a subtropical climate, with very hot summers and mild winters.

Moreover, most parts of China have a continental monsoon climate, with more drastic seasonal temperature variations. As a result, the temperature in China in the winter is 5 to 18 degrees Celsius lower than that in other areas on the same latitude, such as North America and western Europe.<sup>45</sup>

## 5. Air Quality

Air quality in China is poor. Although the trend of worsening air quality in the cities of China has slowed, the overall pollution level is still high.<sup>46</sup> According to the 2006 *China Environmental Quality Communiqué*, 62.4% of the monitored cities have met the national air quality standard of Grade II, and 37.6% are worse than Grade II. Fifty-one cities had air quality worse than Grade III, accounting for 9.1% of the total monitored cities.<sup>47</sup>

Air pollution brings about acid rain.<sup>48</sup> China is one of the countries in the world suffering from severe acid rain contamination, which brings many hazards to the environment, affects the standard of living, and is even harmful to human health. Central, South, Southwest, and East China are the regions with serious acid rain impacts.

## 6. Energy Demand

China's energy demands will continue to grow with economic development. Coal dominates the energy supply in China. In 2005, coal was 63.4% of China's total energy supply, while the share of renewable and waste energy accounts for 13% of the total energy supply.<sup>49</sup> According

45. *See* General Information of the People's Republic of China (PRC), A China Information Base, *available at* <http://www.chinatoday.com/general/a.htm> (last visited Feb. 3, 2011).

46. MINISTRY OF ENVIRONMENTAL PROTECTION OF THE PEOPLE'S REPUBLIC OF CHINA, CHINA ENVIRONMENTAL QUALITY COMMUNIQUES 1996-2008 8 (July 2008), *available at* <http://jcs.mep.gov.cn/hjzl/zkgb/> (last visited Feb. 3, 2011).

47. *Id.*

48. Acid rain is caused mainly by SO<sub>x</sub> and NO<sub>x</sub> from burning coal and oil.

49. International Energy Agency (IEA), IEA Energy Statistics (Aug. 10, 2008), [http://www.iea.org/textbase/stats/pdf\\_graphs/CNTPESPI.pdf](http://www.iea.org/textbase/stats/pdf_graphs/CNTPESPI.pdf) (last visited

to World Energy Outlook 2007, China's energy demand is expected to more than double by 2030, with coal expected to fuel about one-half of the increase.<sup>50</sup> Coal-dominated energy demands will thus lead to increased carbon emissions. Though China has already overtaken the United States as the world's largest carbon emitter,<sup>51</sup> its historical and per capita GHG emissions are relatively low.

## 7. Conclusion

In conclusion, it can be clearly seen that, first, China is vulnerable to the impacts of sea-level rise, because China has a long continental coastline, and most of the relatively developed cities in China, including Shanghai, are along the continental coastline. Second, China is facing the challenge of reducing employment pressure caused by a large population and increasing urbanization. Third, the priority for China at this stage is reducing poverty and developing its economy, goals that demand more energy and will inevitably lead to increased carbon emissions. Fourth, China has relatively harsh climactic conditions, and thus, inhabitants use more energy to maintain a relatively comfortable room temperature. Fifth, air pollution in China is serious, and more efforts are needed to improve air quality. Finally, due to the country's already large share of global emissions, China is under considerable international pressure to reduce emissions without undermining its economic development.

### B. Policy and Legal Initiative Taken by the Chinese Government to Ensure Sustainable Development of Projects

Although there is no officially recognized set of indicators for a quantified assessment of the contribution of CDM projects to sustainable development in China, the Chinese government has taken a series of policy and legal initiatives to promote the development of projects and sustainable development.

#### I. Provisions Under the Measures for the Operation and Management of CDM Projects in China

The Chinese government issued Measures for the Operation and Management of CDM Projects in China (the Measures),<sup>52</sup> which are regarded as basic regulations to

guide the implementation of CDM projects in China. The rules under the Measures, which may influence the CDM projects' contribution to sustainable development, are as follows:

- CDM project activities should promote the transfer of environmentally sound technology to China.<sup>53</sup>
- Chinese-funded or Chinese-holding enterprises within the territory of China are eligible to conduct CDM projects with foreign partners.<sup>54</sup>
- The priority areas for CDM projects in China are energy-efficiency improvement, development and utilization of new and renewable energy, and methane recovery and utilization.<sup>55</sup>
- The national CDM Board has the responsibility to review CDM project activities mainly for expected sustainable development effectiveness.<sup>56</sup>
- Whereas emission-reduction resources are owned by the government of China and the emission reductions generated by specific CDM projects belong to the project owner, revenue from the transfer of CERs shall be owned jointly by the government of China and the project owner, with the allocation ratio defined as below:
  1. the government of China takes 65% of the CER transfer benefit from hydrofluorocarbon (HFC) and perfluorocarbon (PFC) projects;
  2. the government of China takes 30% of the CER transfer benefit from nitrous oxide (N<sub>2</sub>O) projects;
  3. the government of China takes 2% of the CER transfer benefit from CDM projects in priority areas defined in Article 4 and forestation projects.

The revenue the government collects from CER transfer benefits of CDM projects will be used in supporting activities on climate change.<sup>57</sup>

Based on these rules, one may conclude that first, the Chinese government values the transfer of clean technology. However, there are no complementary documents providing guidance for attracting this technology.

Second, the Chinese government tries to promote the improvement of energy efficiency and utilization of new and renewable energy through stipulating the priority areas for CDM projects and providing financial incentives. These measures are beneficial for sustainable development in China.

Feb. 3, 2011).

50. Nobuo Tanaka, World Energy Outlook 2007: China and India Insights Energy Statistics (Nov. 9, 2007), available at [http://www.iaea.org/textbase/speech/2007/Tanaka/weo\\_beijing.pdf](http://www.iaea.org/textbase/speech/2007/Tanaka/weo_beijing.pdf) (last visited Feb. 3, 2011).

51. See, e.g., NETHERLANDS ENVIRONMENTAL ASSESSMENT AGENCY, CHINESE CO<sub>2</sub> EMISSIONS IN PERSPECTIVE (2007) ("the surging power demand from China's rapidly expanding economy caused CO<sub>2</sub> emissions to rise by 9% in 2006 . . . that increase, coupled with a slight United States decline meant that China's emissions for the year surpassed those of the U.S. by 8%").

52. Measures for the Operation and Management of CDM Projects in China 2005 (promulgated by the Ministry of Foreign Affairs, Ministry of Science and Technology, Ministry of Finance and State Development and Reform

Commission, Order No. 37, Oct. 12, 2005, effective Oct. 12, 2005), available at <http://cdm.ccchina.gov.cn/english/NewsInfo.asp?NewsId=905> [hereinafter the Measures].

53. *Id.* art. 10.

54. *Id.* art. 11.

55. *Id.* art. 4.

56. *Id.* art. 15(8).

57. *Id.* art. 24.

Although China has the largest share of CERs issued, a large share of the CERs is generated from the “low-hanging fruit” CDM projects that reduce end-of-pipe emissions of HFC-23.<sup>58</sup> The 10 Chinese HFC-23 projects alone account for 27.27% of the total expected CERs and 53.37% of the CERs from Chinese projects.<sup>59</sup> Seven out of the 10 HFC-23 projects were registered in 2006.

The HFC-23 destruction projects were very popular in China, because they have a relatively short project-cycle time and offer large volumes of credits for a low capital-investment and mitigation cost. Furthermore, additional assessments are relatively straightforward. In addition, China is estimated to account for more than one-half of global emissions of HFC-23.<sup>60</sup> Therefore, developing the HFC-23 CDM projects could bring industries more economic benefits than innovating technology to reduce HFC-23 emissions. Based on the above, most Chinese industries would rather apply for CDM projects with the current HFC-23 emission level than reduce it. However, there is limited potential for these projects, as a significant proportion is already in the CDM pipeline. Facing this situation, China began to attach greater importance to the energy sector, primarily renewable energy and energy efficiency. The majority of registered and issued credits in China after 2007 are concentrated in the energy sector.

Third, the Chinese legal system has not clearly defined the legal nature of CERs and who has the right to them. Only the Measures mention the ownership issues surrounding CERs. According to these provisions, GHG reduction is considered to be tied to a natural resource, and therefore the property of the Chinese government. Also, the Chinese government allows eligible private CDM project owners to enter into concession arrangements to manage these resources and create CERs from them. Because CERs are sovereign property, the Chinese government may take a proportion of the CERs from the project and revenue from the transfer of CERs, which are owned jointly by the Chinese government and the project owner.

The problem here is these provisions on the CERs are in violation of existing legislation in China. Item 1 Article 9 of the Constitution of the People's Republic of China of 1982 states that all mineral resources, water, forests, mountains, grasslands, unreclaimed land, beaches, and other natural resources are owned by the state, that is, by the whole people.<sup>61</sup> On the one hand, there is no clear indica-

tion in Chinese law that the emission-reduction resource is classified as a natural resource; on the other hand, even if assuming that the GHG reduction belongs to a natural resource, the statement in the Measures that the emission reduction resource is owned by the Chinese government does not comply with the relevant provision in the Constitution. Therefore, it is necessary to review the current ownership issues concerning CERs in China.<sup>62</sup>

Fourth, according to the provision concerning the participation eligibility, the Chinese partner must have a minimum of a 51% share in a CDM project.

Although the ban on foreign majority ownership of CERs is made with a view to maintaining the initiative of Chinese CDM developers in implementing CDM projects, this regulation could actually undermine the development of CDM projects in China. First of all, this regulation on project ownership could deter potential investors. Many factors, including investment in a CDM project, technology transfer, and economic profits in particular, are of great significance when investors are considering participating in a CDM project in China. They therefore want to hold a larger share in CDM project ownership or take the initiative in implementing a CDM project in order to protect their own interests. By comparison, the Chinese project developers, who lack the funds and the clean technology to reduce emissions, could only provide the project itself. Moreover, the proceeds of CERs cannot be obtained until a transaction is made in the international carbon market. In this circumstance, the project ownership limit could have an adverse impact on the implementation of CDM projects in China, making the potential investors abandon directly investing in projects in China and choose to invest in other host countries, or buy CERs on the carbon market instead. Second, this unfavorable position of investors not having a majority interest may pose problems for introduction of technical know-how, which is regarded as the key to a low-carbon economy in China. In this case, most investors are more cautious about transferring their advanced technologies under the existing legal frameworks in China. Finally, the limitation on the CDM project ownership makes it impossible to allocate the CERs according to an ownership structure.<sup>63</sup> Otherwise, the foreign partner, who is expected to invest more funds and technologies than the Chinese partner in CDM projects, on the contrary, could be allocated relatively fewer CERs and, accordingly, obtain less in proceeds from selling CERs.

58. HFC-23 (trifluoromethane) is generated as a waste gas in the manufacturing process of HCFC-22, a gas used as refrigerant and as a raw material for other products. It has a global warming potential 11,700 times greater than CO<sub>2</sub>. The UNFCCC and the Kyoto Protocol list HFC-23 as a major potential GHG and one of the first types of projects established under the CDM was the investment in the destruction of the compound HFC-23.

59. These percentages are calculated according to the information on registered CDM projects disclosed by the UNFCCC. CDM Statistics, *supra* notes 32, 33. The Chinese HFC-23 projects are expected to generate 57,785,472 tons of CERs.

60. JANE ELLIS & SAMI KAMEL, *OVERCOMING BARRIERS TO CLEAN DEVELOPMENT MECHANISM PROJECTS 10* (Organization for Economic Cooperation and Development and International Energy Agency, 2007).

61. Constitution of the People's Republic of China (promulgated by the Nat'l People's Cong., Dec. 4, 1982, effective Dec. 4, 1982, last amended Mar. 14,

2004) 1982 Nat'l People's Cong. Gaz., art. 9, item 1 (P.R.C.), available at <http://english.peopledaily.com.cn/constitution/constitution.html>.

62. See also Mingyuan Wang, *Supervision of Clean Development Mechanism Projects in China—Illusory Rules of Law and Real Government Intervention*, 11 ASIA PACIFIC J. ENVTL. L. 121, 129 (2008).

63. See, e.g., Law of the People's Republic of China on Chinese—Foreign Equity Joint Ventures 1979 (promulgated by the Standing Comm. Nat'l People's Cong., July 1, 1979, last amended Mar. 15, 2001) 1979 Standing Comm. Nat'l People's Cong. Gaz. art. 4, ¶ 3 (P.R.C.) (“The parties to the venture shall share the profits, risks and losses in proportion to their contributions to the registered capital.”), available at [http://www.china.org.cn/business/laws\\_regulations/2007-06/22/content\\_1214773.htm](http://www.china.org.cn/business/laws_regulations/2007-06/22/content_1214773.htm).



## 2. CDM Fund

The CDM Fund (CDMF), managed by the Ministry of Finance, was launched in Beijing in November 2007, to finance the country's efforts to address climate change.<sup>64</sup> The CDMF was proposed as a specialized financing mechanism to support promotion of CDM-eligible projects through enhancing capacity-building and awareness and other climate-change mitigation and adaptation activities in China. According to the current situation of CDM projects, more than \$3 billion will be injected into the CDMF, which may help China improve energy efficiency, protect the environment by using clean energy for power generation, and raise money from various sources, which mainly include the levies on incomes generated through the selling of CERs by CDM projects in China and capital cooperation with the international finance organizations.<sup>65</sup>

The Chinese government has set up the CDMF aimed to provide long-term financial support for CDM projects and other projects addressing climate change. Although the nature, purpose, structure, and other general issues about the CDMF are clear, the detailed rules for implementation and management are not transparent and public. Therefore, detailed management measures should be formulated in order to ensure financial support for CDM projects.

## 3. Other Regulations or Laws

The Circular Economy Promotion Law of 2008 was promulgated with a view to increasing resource utilization, protecting and improving the environment, and realizing sustainable development through promoting the circular economy in China.<sup>66</sup> According to the law, restructured and new industrial facilities must incorporate energy-efficiency designs and must undergo environmental assessment.<sup>67</sup> In addition, in order to promote its development, the circular economy appraisal and assessment would be established as a criterion for evaluating the performance of officials at local governments.<sup>68</sup>

Although CO<sub>2</sub> is not a pollutant regulated under Chinese environmental legislation, some provisions in envi-

ronmental protection laws may affect implementation of CDM projects in China. A CDM project requires developers to undertake an appropriate environmental impact assessment. In addition, developing or restructuring a project in China requires the necessary environmental consents and licenses to build and operate the project. The relevant provisions in the Environmental Protection Law of 1989 are as follows:

... The environmental impact statement on a construction project must assess the pollution the project is likely to produce and its impact on the environment and stipulate the preventive and curative measures; the statement shall, after initial examination by the authorities in charge of the construction project, be submitted by specified procedure to the competent department of environmental protection administration for approval. The department of planning shall not ratify the design plan descriptions of the construction project until after the environmental impact statement on the construction project is approved.<sup>69</sup>

The Renewable Energy Law of 2005 confirms the role of renewable energy in China's national energy strategy and promotes the development and utilization of renewable energy.<sup>70</sup> It provides a legal guarantee for supporting renewable energy development and utilization in China through protecting legal interests and rights of the projects developers, removing barriers to the development of the renewable energy market, setting up a financial guarantee system, and creating a social atmosphere conducive to renewable energy. In this sense, CDM projects concerning renewable energy would be encouraged and could enjoy a favorable legal environment in China.

With the main purpose of encouraging the import of advanced foreign technology and equipment, the Chinese government formulated the Circular of the State Council on Adjustment of Imported Equipment Taxation Policies in 1997 (the Circular) stating that "starting from January 1, 1998, imported equipment of domestic investment projects and foreign investment projects encouraged by the State shall enjoy exemption from tariff and import-stage value-added tax within the special scope."<sup>71</sup>

According to the Circular, equipment imported for foreign-invested and domestic-invested projects that are encouraged and supported by the state, which involve technology transfer, foreign government loans, and inter-

64. China Clean Development Mechanism Fund website, <http://www.cdm-fund.org> (last visited Feb. 3, 2011).

65. Lindsay Beck, *China Emission-Cutting Fund to Reap up to \$3 bln*, REUTERS (Beijing), Nov. 9, 2007, <http://www.reuters.com/article/idUSPEK28505> (last visited Feb. 3, 2011).

66. After the proposal of a new industrialization model, the circular economy was introduced into China and started to flourish. Circular economy is a new economic development model believed to be environmentally friendly because it makes full and efficient use of resources and energies and minimizing waste discharge through the technological innovation of the traditional industries. Under the circular economy, a facility's waste, including energy, water, materials—as well as information—may be reused as another facility's input. By working together, the whole society obtains a larger collective benefit, with lower resources input, higher efficiency, and lower emissions.

67. Circular Economy Promotion Law of the People's Republic of China 2008 (promulgated by the Standing Comm. Nat'l People's Cong., Aug. 29, 2008, effective Jan. 1, 2009) 2008 Standing Comm. Nat'l People's Cong. Gaz. art. 29, ¶ 4 (P.R.C.), available at [http://www.fdi.gov.cn/pub/FDI\\_EN/Laws/GeneralLawsandRegulations/BasicLaws/P020080919377641716849.pdf](http://www.fdi.gov.cn/pub/FDI_EN/Laws/GeneralLawsandRegulations/BasicLaws/P020080919377641716849.pdf).

68. *Id.* at art. 14.

69. Environmental Protection Law of the People's Republic of China 1989 (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 26, 1989, effective Dec. 26, 1989) 1989 Standing Comm. Nat'l People's Cong. Gaz. art.13 (P.R.C.), available at <http://www.china.org.cn/english/environment/34356.htm>.

70. See Renewable Energy Law of the People's Republic of China 1989 (promulgated by the Standing Comm. Nat'l People's Cong., Feb. 28, 2005, effective Jan. 1, 2006, amended Apr. 1, 2010) 2005 Standing Comm. Nat'l People's Cong. Gaz. (P.R.C.), available at <http://www.ccchina.gov.cn/en/NewsInfo.asp?NewsId=5371>.

71. Circular of the State Council on Adjustment of Imported Equipment Taxation Policies 1997 (the State Council of the People's Republic of China, Dec. 29, 1997, effective Dec. 29, 1997) 1997 State Council, ¶ 1 (P.R.C.), available at [http://www.chnlaw.net/englishlaw/HTML/englishlaw\\_1632.htm](http://www.chnlaw.net/englishlaw/HTML/englishlaw_1632.htm).

national financial organization loans, shall enjoy tariff and import-state value-added tax exemption.<sup>72</sup> Therefore, CDM projects that involve technology transfer and foreign loans may enjoy preferential import duties

### C. *The Performance of the CDM in China*

Considering the pillars of sustainable development as economic development, social development, and environmental protection, this section discusses the contribution of the CDM to sustainable development in China from environmental aspects, economic aspects, and social aspects.

#### I. Environmental Aspects

##### a. Emissions Reduction

Generating CERs is the goal of implementing a CDM project. As mentioned earlier, China has become the No.1 host country of CDM projects, with the most registered projects, as well as 209,625,170 tons of CERs issued from these projects, accounting for 50% of the overall CDM emission reductions. In spite of the fact that the huge amount of CERs shows the contribution of CDM projects to emission reductions in China, two problems persist.

First, there is a concern that a large share of CERs is generated from the CDM projects that reduce end-of-pipe emissions of HFC-23 or N<sub>2</sub>O. As mentioned earlier, there is limited potential for these projects, as a significant proportion is already in the CDM pipeline, and thus cannot bring long-term benefits to China.<sup>73</sup>

Second, there is concern that CDM credits do not reflect real emission reductions. This is the problem of determining additionality. For example, in China, coal-fired power plants generate approximately 80% of all electric power.<sup>74</sup> In order to support rapid economic development, China is building new power plants at an astonishing rate. In order to reduce the country's dependence on coal, the Chinese government has implemented a series of policies and laws to promote the development of renewable energy. China's current five-year plan<sup>75</sup> calls for major investments in hydropower, wind, nuclear, and natural gas-fired power. The Renewable Energy Law<sup>76</sup> also provides strong financial incentives and takes other measures for development of the wind sector. Even with such favorable legal and financial environments, each new dam, wind farm, or natural gas power plant applies individually under the

rules of the CDM and argues that it would not be growing at all without help from the CDM. Based on the above, many scholars question the authenticity of the additionality of projects.<sup>77</sup> Actually, dozens of Chinese wind projects have been delayed or rejected due to concerns over their additionality.<sup>78</sup>

The fact that China has a relatively low CER issuance rate also reflects the problems in additionality. The CER issuance rate demonstrates the ratio between expected CER issuance volume and actual CER issuance volume. Considering CERs only from registered projects, China's CER issuance rate is only 9.1%, as opposed to 86.5% and 57.7% for India and Brazil.<sup>79</sup>

There are three reasons for concern leading to the low project CERs issuance rate in China. First, project developers or CDM service agencies may overestimate the amount of CERs that would actually be generated when designing the project, in order to attract foreign investors. Second, the project cannot perform as expected and generate CERs, due to the inappropriate monitoring plan in the PDD. Finally, the DOE's tendency to overestimate the expected CERs is another cause for concern. Project owners present the expected CERs volume, and have incentive to overestimate. Since the DOE is employed and paid by project developers, the DOE is likely to approve the developer's estimation of CERs in the PDD.

##### b. Environmental Quality Improvement

CDM projects lead to less local pollution. As mentioned earlier, air pollution in China is severe, and acid rain is one of the most serious problems in China. The energy-related climate-change abatement produced by certain CDM projects reduces emissions into the air of sulfur dioxide, particulates, N<sub>2</sub>O, heavy metals, such as mercury, and a range of organic compounds.<sup>80</sup> Lower emissions into the air help decrease the frequency of induced acid rain and improve local air quality. Correspondingly, water and groundwater qualities are improved.

According to the relevant provisions in the Environmental Protection Law of 1989 and the Circular Economy Promotion Law of 2008, developing CDM projects in China need to meet the relevant environmental requirements and must undergo environmental impact examination by the competent departments. These provisions assist in ensuring the environmental integrity of the CDM in China.

72. *Id.* pt. I. Provided that such items are not among commodities listed in the Catalogue of Imported Commodities Not Entitled for Tariff Exemption for Projects With Foreign Investment, available at <http://www.customslawyer.cn/fkg/hgtgygs/jmsfg/200212/30980.html>.

73. This is according to the Project Activities on the UNFCCC website, <http://cdm.unfccc.int/Projects/index.html> (last visited Feb. 3, 2011).

74. Wara & Victor, *supra* note 25, at 12.

75. See The Eleventh Five-Year Plan for the Development of National Economy and Society (2006-2010) (promulgated by the Nat'l People's Cong., Apr. 14, 2006), ch. 6, available at [http://en.ndrc.gov.cn/hot/t20060529\\_71334.htm](http://en.ndrc.gov.cn/hot/t20060529_71334.htm).

76. See *supra* note 79, ch. 6.

77. See Wara & Victor, *supra* note 25, 12-14.

78. The decisions of the EB have been numbered serially and can be downloaded at the website of the UNFCCC under <http://cdm.unfccc.int/EB/index.html>.

79. Yiqun Huang, Assessing and Managing Regulatory Risk in China's CDM Market 4 (2007) (unpublished Masters Thesis, Oxford Univ.).

80. Haakon Vennemo et al., *Domestic Environmental Benefits of China's Energy-Related CDM Potential* 75(1-2) CLIMATE CHANGE 215, 221 (2006).

## 2. Economic Aspects

### a. Profits

There have been no official statistics concerning the economic profits brought by CDM projects in China. However, it is estimated that some \$95 billion in clean energy investment benefited from the CDM over 2002-2008.<sup>81</sup> In addition, the research documents of the Tsinghua University CDM Project Research Group and the CDM projects listing of the National Climate Change Coordinating Committee showed that about \$930 million in capital was invested into four CDM projects in China between 2002 and 2005. The Huitengxile wind farm alone brings 270 million euros in economic profits to Chinese enterprise.<sup>82</sup> Moreover, Zhenhua Xie, Vice-Minister of the National Development and Reform Commission (Chinese DNA) said that there had been 885 CDM projects approved by the Chinese DNA by the end of October 2007. If these projects were implemented, they would reduce GHG emissions equivalent to 1.5 billion tons of CO<sub>2</sub> and generate credits worth \$15 billion.

The CDM makes enterprises aware that they can derive economic benefits from taking social responsibilities. More and more entrepreneurs are beginning to realize the commercial benefits of reducing emissions through CDM projects. Reducing carbon emissions and improving energy efficiency has become a trend in China.

### b. Revenue Increase

The implementation of the CDM would not only improve the financial performance of industry, but also increase tax revenues for the nation. Given rapid growth in energy and electricity demand in China, systematic uptake of the CDM by Chinese developers could lead to large volumes of credit generation. Thus, the CDM provides a new revenue stream by placing CERs for sale in the carbon market, which may earn a good rate of return for project developers, and at the same time reduce the cost of products. In addition, China may obtain more tax revenues through imposing business taxes for project implementation, income taxes for employees, and taxes on selling CERs.<sup>83</sup> Some of these revenues contribute to sustainable development in China. For example, the CDMF, funding for which is derived from the levies on sales of CERs by CDM projects in China, works to address global warming in China.

81. KARAN CAPOOR & PHILIPPE AMBROSI, *STATE AND TRENDS OF THE CARBON MARKET 2009* 28 (World Bank, 2009).

82. The first CDM project, Huitengxile Wind Farm Project of Inner Mongolia, with credits purchased by the Dutch government, started bidding at the end of 2001 and was approved by the Chinese government in November 2004. Half a year later, it was successfully registered in June 2005, becoming the first registered CDM project in China and the first registered project for wind energy in the world.

83. See *supra* note 61, art. 24.

### c. Employment Expansion

In China, employment is one of the top concerns for the government at all levels, due to the country's huge population and increasing urbanization. CDM projects may ease the pressure by providing more job opportunities from newly established CDM projects. In addition, the CDM may help to start up new domestic industry sectors for renewable energies, which had been lagging, due to the lack of advanced technologies or capital. Hence, more new jobs would be created.

The CDM has given rise to some new businesses, such as carbon market consultants and CDM trading lawyers, and has preliminarily helped to create a team devoted to the development, implementation, and administration of CDM projects.<sup>84</sup> Also, with the contribution of the CDM, the advanced environmental consultant service industry in China has been greatly promoted.<sup>85</sup>

### d. Regional Economic Disparity Reduction

Implementing CDM projects would also be beneficial to promote economic development in rural and remote areas. As mentioned earlier, remarkable disparity in economic development exists among different regions of China. The remote areas in the western part of China are the least developed regions, and more than 30 million households without electricity are concentrated there where the large grid cannot reach.<sup>86</sup> Facing this situation, China is carrying out the Large-Scale Development of West China Policy.<sup>87</sup> However, these regions are ideal for renewable energy projects, which may promote the development of solar and wind energy as a favorable factor to attract CDM developers.

According to the information disclosed by the official CDM website in China, CDM projects cover all the provinces in China.<sup>88</sup> Among them, Yunnan Province, which is located in western China, conducts the most CDM projects. In addition, Sichuan Province, Inner Mongolia Province, Hunan Province, and Gansu Province undertake relatively more CDM projects. Therefore, the western China, a relatively poor region in China with abundant

84. POLICY RESEARCH CENTER FOR ENVIRONMENT AND ECONOMY OF THE MINISTRY OF ENVIRONMENTAL PROTECTION, RESEARCH CENTER OF URBAN DEVELOPMENT AND ENVIRONMENT OF THE CHINESE ACADEMY OF SOCIAL SCIENCE AND ENERGY RESEARCH INSTITUTE OF NATIONAL DEVELOPMENT AND REFORM COMMISSION, *ASSESSMENT OF THE IMPACT OF CHINA'S CDM PROJECTS ON SUSTAINABLE DEVELOPMENT 153* (EU-China CDM Facilitation Project, 2009), available at [http://www.euchina-cdm.org/media/docs/Sustainable%20Impact%20Assessment%20of%20China%20CDM%20Project%20\\_EU%20China%20CDM%20Facilitation%20Project.pdf](http://www.euchina-cdm.org/media/docs/Sustainable%20Impact%20Assessment%20of%20China%20CDM%20Project%20_EU%20China%20CDM%20Facilitation%20Project.pdf).

85. *Id.*

86. See Clean Energy Changes Life of People in Remote Regions, Xinhua News Agency, Nov. 23, 2005, <http://www.china.org.cn/english/features/poverty/149595.htm> (last visited Feb. 3, 2011).

87. Due to the remarkable disparity in economic development in different regions of China, the Chinese government introduced the strategy of large-scale development of its western regions in 2000 with a view to promoting the development in western regions.

88. See CDM Information Platform, Clean Development Mechanism in China, <http://cdm.ccchina.gov.cn/english/ItemList.asp> (last visited Feb. 3, 2011).

wind resources, attracts numerous CDM project investors with its natural and geographic advantages for renewable projects. The projects implemented in these regions would not only improve local economic development, but would also help to reduce regional economic disparity in China. For example, a \$150 million loan under the CDM project Lanzhou Sustainable Development Urban Transport Programme has been granted to Lanzhou City, the provincial capital of Gansu Province.<sup>89</sup> This money will be used to improve the transport system in Lanzhou.

### e. Technology Transfer

In many instances, international environmental regimes include provisions to support clean technology transfer to developing countries, due to the fact that technological advances are often the key to environmental gains.<sup>90</sup> The CDM is thus designed to mobilize financial resources and to promote technology transfer from industrialized countries to developing countries. There is no doubt that environmentally sound technology is the decisive factor influencing sustainable development in China. However, the CDM in China has its limitations in promoting energy-related technology transfer and diffusion.

Widespread technology transfer and diffusion through the CDM faces many difficulties. Despite clear encouragement by the international community, technology transfer is a very complex process, as under the CDM, there is no obligation for the developed countries to treat technology as anything different than any other commodity. Since it is a competitive project-based CER-generating and trading scheme, the pursuit of cost-effectiveness and commercial profits dominates the CDM scheme. Moreover, public-owned technologies in developed countries that governments have control over are few. Most of the technologies are invented through research by public investments, and then developed by private entities who then claim ownership. Accordingly, the potential technology transfer between the private sector in developed countries and China is relatively rare. Most CDM investors in developed countries choose to achieve their emission targets in the easiest and most cost-effective way, with the least investment and least technology transfer, in order to keep competitive advantages. Therefore, the extent of technology transfer taking place via the CDM is limited.

In addition, the actual ownership of the technology and know-how in the project implementation process is in the hands of private ownership, which is subject to trade secrecy and intellectual property rights under the Trade-

Related Aspects of Intellectual Property Rights (TRIPs) Agreement. Therefore, their use is subject to the payment of royalties and licensing fees, and such technology is diffused on commercial market terms.<sup>91</sup> Meanwhile, there are inadequate funds and a legal system to support technology transfer in both the international and domestic environmental regimes. As mentioned earlier, the provisions relating to participation eligibility under the Measures also influences technology transfer to China.<sup>92</sup>

As a matter of fact, the promotion of technological innovation and diffusion in China has not been very successful. From the description of the PDD, the CDM projects that include technology transfer account for less than 40% of total projects.<sup>93</sup> Even among these projects referred by the PDD as having technology transfer, field research shows that two-thirds of their transfer is equipment input, and the equipment is actually purchased at the market price, with no discount offered.<sup>94</sup> The remaining one-third of the transfer includes knowledge and ability training, but it is only the operation and maintenance training for ordinary equipment, not the transfer of equipment manufacturing technology.<sup>95</sup> These realities have directly limited what the CDM can contribute to sustainable development.

China is benefitting financially from the CDM. First, the introduction of foreign investment to CDM projects and the revenues from selling the generated CERs have brought massive economic benefits to project participants and the Chinese government. Secondly, according to the geographic distribution of CDM projects in China, the western region possesses the most CDM projects, which helps to improve the local economic development and reduce regional economic disparity in China. However, and most importantly, China is not realizing the technology transfer intended by the CDM.

## 3. Social Aspects

### a. Health

Implementation of CDM projects in China could improve local environmental quality and thus provide immediate benefits to human health. If China were to realize its CDM potential, it could save between 2,700 and 38,000 lives annually through increased air quality.<sup>96</sup> Further, the economic benefits brought by CDM projects could promote national health and medical welfare.

89. Benefiting From the CDM, Lanzhou Gets a US \$0.15 Billion Loan From Asian Development Bank, CNR CN, Dec. 16, 2009, available at [http://www.cnr.cn/allnews/200912/t20091216\\_505766758.html](http://www.cnr.cn/allnews/200912/t20091216_505766758.html) (last visited Feb. 3, 2011).

90. Daniel C. Esty & Maria Ivanova, Globalization and Environmental Protection—A Global Governance Perspective, Working Paper No. 0402, 15 (Yale Center for Environmental Law and Policy, 2004). See also MARION R. CHERTOW & DANIEL C. ESTY, THINKING ECOLOGICALLY: THE NEXT GENERATION OF ENVIRONMENTAL POLICY (1997).

91. Zainal Abidin Sanusi, Technology Transfer Under Multilateral Environmental Agreements: Analyzing The Synergies, Working Paper No. 134, UNU-IAS 2 (2005).

92. *Supra* note 61, art 11 (“Chinese-funded or Chinese-holding enterprises within the territory of China are eligible to conduct CDM projects with foreign partners.”).

93. *Supra* note 92, at 154.

94. *Id.*

95. *Id.*

96. Vennemo, *supra* note 80, at 220.

### b. *Environmental Awareness*

The implementation of CDM projects in China could, in theory, increase public awareness of environmental challenges. The CDM is a complex mechanism involving the participation of public sectors, private sectors, and local communities, as well as cooperation with international entities. Accordingly, in order to successfully implement a CDM project in China, it is necessary to understand CDM-related rules in both the international context and the domestic context. China has set up 27 provincial CDM information and education centers at the local levels, and has carried out CDM training at a grassroots level. In this manner, the CDM could play an important role in realizing national climate change programs and environmental protection policies at local levels.<sup>97</sup> Moreover, CDM projects could also play a positive role in improving policymakers' and energy industries' awareness and understanding of climate change, clean technology, and carbon trading, thus helping to enhance a sense of urgency about global warming.<sup>98</sup>

Although the CDM brings clean development ideas, and the Chinese government and industries have taken part in carbon-reduction projects, the CDM does not significantly enhance environmental awareness. The CDM per se is designed to be a market-based instrument. As a result, project participants are bound to pursue the maximum economic profits at the lowest possible cost. In this circumstance, most of the CDM developers in China undertake the projects so that those projects can bring financial and technological benefits. That is, they are still responding to market incentives, rather than a feeling of obligation to work for environmental protection.

### c. *Public Participation*

A CDM project must receive national approval from the DNA, which approval is based on reviewing how the project will contribute to sustainable development. To this end, the PDD has to detail explicitly what expected sustainable benefits are to be achieved by a project, through presenting the documentation related to the environmental impact assessment of the project and describing how the relevant local stakeholders are allowed to participate and provide comments and feedback. The Chinese government has not satisfactorily fulfilled this CDM requirement.

First of all, under the existing institutional framework, there is no specific procedure for carrying out stakeholder consultation in CDM projects in China. Then, with respect to consultation processes described in the PDD, there is still a lack of transparency or an effective way to reflect the local population's demands. Most of the CDM projects in China do not take stakeholder consultation seriously in their PDD.<sup>99</sup> Some of the CDM projects do not

state in their PDDs what kind of consultation process they organize at all; most of them may use a written survey or questionnaire as a tool to gather comments, and only a few of them may organize a public meeting or public discussion with the local population.<sup>100</sup> Given the written media limiting the range of stakeholders allowed to participate, it seems that the current stakeholder consultation process in China is not sufficient for gathering opinions from local residents and reflecting their concerns.<sup>101</sup> Therefore, public participation needs to be improved when developing CDM projects in China.

Though the CDM does bring some benefits to China, there is concern that implementing CDM projects may exert a negative impact on low-carbon development in the long term. On the one hand, transfer of environment-friendly technologies through the CDM is limited. On the other hand, in order to develop a low-carbon economy in the future, a significant breakthrough of high-efficiency technological innovation is much needed. The CDM sends a signal that carbon emissions and poor technologies could be a favorable condition to attract foreign investment and cooperation. Under the CDM, there may be a lack of incentive to stimulate self-innovation. In this regard, CDM is not beneficial for technological innovation in China.

In addition, over the long term, the CDM would bring challenges, in that China is expected to take on more obligation of reducing carbon emissions in the post-2012 period. As a result of additionality issues, real emission reductions through the CDM are limited. Moreover, without intending it, the CDM had created a perverse disincentive for developing countries to pass laws encouraging emission reductions.<sup>102</sup>

## III. Implications of the CDM for China Beyond 2012

As the expiration of the first Kyoto period looms, various negotiations on a new international agreement on climate change beyond 2012 are underway. International criticism of the CDM's contribution to global warming and sustainable development will be one of the major topics of these negotiations. According to the U.N. documents relating to the CDM, reforms of the CDM could have an impact on China.

Post-2012 climate-regime options concerning the CDM were discussed at the Bali Conference and the Copenhagen Conference, including an expanded scope for CDM projects, simplified procedures for CDM project implementation, and improving the CDM EB and DOE's

100. *Id.*

101. *Id.*

102. WILLIS MONIQUE ET AL., *THE CLEAN DEVELOPMENT MECHANISM: SPECIAL CONSIDERATIONS FOR RENEWABLE ENERGY PROJECTS, RENEWABLE ENERGY & ENERGY EFFICIENCY PARTNERSHIP* (2006), available at [http://www.reil-project.org/Publications/REIL\\_CDM\\_Paper.pdf](http://www.reil-project.org/Publications/REIL_CDM_Paper.pdf). See also S epibus, *supra* note 4, at 9.

97. *Supra* note 92, at 153.

98. *Id.*

99. CASTRO & MICHAELOWA, *supra* note 29, at 52-59.

performance.<sup>103</sup> These improvements in the CDM would further promote its development in China beyond 2012. However, other improvements, including reducing projects' geographical disproportion and providing preferential rules for least-developed countries to implement the CDM, would make competition for project siting more intense.<sup>104</sup>

The EB and the DOEs have begun to tighten their supervision and verification on China's CDM projects, as China has become the largest beneficiary and the questions about Chinese projects' additionality arise.<sup>105</sup> This increased scrutiny puts CDM projects in China at a disadvantage, in that it would be more difficult for project owners and developers to gain registration from the EB.

Finally, the European Union (EU) sees itself as a champion in the fight against climate change, leading the world in legislation, action, and technology regarding energy saving and emission reduction. In addition, the EU's active participation promotes the development of global carbon market. It is the biggest buyer of CERs, dominating the CDM market with over 80% of volumes transacted for the three consecutive years from 2006 to 2008.<sup>106</sup> Although the EU has committed to battling global warming with the binding target beyond 2012, it is watching the move of the United States and the major developing countries. Moreover, the European Commission has proposed freezing new demand for new CDM projects in 2012, unless the major polluters like China, India, and the United States set emissions reductions.<sup>107</sup> This proposal creates uncertainty about the development of CDM projects in the post-2012 period. Accordingly, without the demand for CERs from the EU, the momentum of implementing CDM projects in China would be hindered.

Therefore, although the CDM operation rules and management are expected to be improved, uncertainty and instability in the global carbon market would affect the performance of CDM projects in China in the post-2012 period.

#### **IV. Conclusion and Recommendations: Dealing With the Limitations of the CDM in Promoting Sustainable Development in China**

It can be concluded from the previous sections that although the CDM has brought and is expected to bring

considerable benefits to China, its limited and in some cases negative impacts may affect China's sustainable development in the longer term. China should therefore, on the one hand, rely on other measures to realize sustainable development, while at the same time make full use of the positive contributions of properly administrated CDM projects. There are some measures that can be taken to deal with the limitations of the CDM.

##### **A. Setting Up Clear Sustainable Development Standards**

It would be very significant for the Chinese government to set up clear sustainable development standards when approving the proposed projects in order to ensure the CDM's contribution to sustainable development. Due to China's national circumstances, sustainable development standards for CDM projects in China encompass four factors.

##### **(1) Economics**

The principal priority for China at this stage is to alleviate poverty and to further develop its economy. In this sense, CDM projects must be beneficial for China's economic development. In other words, the CDM project activities should bring in additional investment and could promote economic well-being in China.

##### **(2) Environment**

Environmental problems are critical in China. Thus, sustainable development in China will not be realized without environmental protection. In this regard, CDM project activities should promote environmental well-being. The CDM should not only bring carbon-emission reductions to help address climate change, but should also not have any negative impact on other environmental issues. However, the current stakeholder consultation process is weak in China. Thus, there must be a strict environmental impact assessment procedure to force project developers to consider the potential environmental impact of the project activity before applying for government approval of a CDM project.

##### **(3) Social Factors**

In spite of rapid economic development, China still faces great social problems, which include widespread economic disparity in different regions, as well as significant employment pressure caused by its huge population. Therefore, the CDM must be beneficial to assist in addressing these social problems in China, by bringing in foreign investment and clean technology in less-developed regions, generating additional employment, and improving quality of life.

103. The Bali Conference released a document concerning the CDM in 2007. For details, see Decision -/CMP.3, *Further Guidance Relating to the Clean Development Mechanism*, UN Doc. FCCC/KP/CMP/2007/3 (2007). The Copenhagen Conference also released a document concerning the CDM in 2009. For details, see Draft Decision -/CMP.5, *Further Guidance Relating to the Clean Development Mechanism*, ¶¶ 2, 8, 17, UN Doc. FCCC/KP/CMP/2009/16 (2009).

104. UN Doc. FCCC/KP/CMP/2009/16 (2009), *supra* note 103, ¶ 48.

105. UN Doc. FCCC/KP/CMP/2007/3 (2007), *supra* note 103, at II.

106. CAPOOR & AMBROSI, *supra* note 81, at 31.

107. See Anita Gordon, *State and Trends of the Carbon Market 2008*, World Bank website, Cologne, Germany, May 7, 2008, <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTENERGY2/0,,contentMDK:21759158-menuPK:4137780-pagePK:64020865-piPK:149114-theSitePK:4114200,00.html> (last visited Feb. 3, 2011).

#### (4) Technology

Clean technology is no doubt a key factor leading to sustainable development. However, it is a weak point in China. Thus, in order to promote the transfer of environmentally sound technology throughout China, a technological indicator should be included in all proposed and approved projects.

#### B. *Effective Management of CDM Projects*

CDM projects inevitably possess economic attributes, as the CDM is a market-based mechanism. For this reason, most CDM developers undertake projects with a view to pursuing maximum commercial benefits, rather than focusing on the need to address climate change and promote sustainable development in China. Government intervention is therefore needed to moderate the conflict between public interests and private interests. Accordingly, the Chinese government should play an active role in mitigating the limited or negative impact of the CDM projects on China's sustainable development in the long term by providing effective management and regulation. The effective management and regulation of CDM projects in China can be realized by regulating participation eligibility of CDM projects, government oversight of CDM projects, and managing CDM projects through financial measures.

#### (I) Regulation of project participation eligibility

As mentioned earlier, project participation eligibility in China is not necessarily beneficial in promoting clean technology transfer.

Foreign partners have expressed their concern about this restriction.<sup>108</sup> European companies are major buyers of China-generated CERs. The EU is also the largest source of China's technology imports.<sup>109</sup> However, European companies hope that restriction can be relaxed. According to Ambassador Serge Abou, Head of the Delegation to the European Commission to China, EU developers would be more willing to bring the most advanced technologies to China if they remain the controlling party to protect their intellectual property rights.<sup>110</sup>

Given the importance of clean technology to sustainable development in China, the Chinese government should extend the requirement for participation eligibility of the specific CDM projects that could bring advanced clean technology to China.

108. See Transnational Review Mechanism Pursuant to Paragraph 8 of the Protocol on the Accession of the People's Republic of China, WTO Doc G/TRIMS/W/60 (2008) (Request to the Delegation of the European Communities—Communication From the European Communities).

109. See European Commission Trade, China, <http://ec.europa.eu/trade/creating-opportunities/bilateral-relations/countries/china/> (last visited Feb. 3, 2011).

110. He said this at a press conference in Beijing for the Second EU-China High-Level Economic and Trade Dialogue held in Brussels, Belgium, on May 7-8, 2009.

#### (2) Government oversight of CDM projects

The Chinese government may regulate the development of CDM projects in China and promote sustainable development over the long term by providing guidance on project scope, scale, and geographic distribution.

As mentioned above, project developers tend to pay attention to the economic benefits that result from CDM projects, while ignoring the other aspects that would affect sustainable development in China. For example, projects that reduce end-of-pipe emissions of HFC-23 or N<sub>2</sub>O accounted for large a part of CERs. However, this type of project cannot bring long-term benefits to China. Accordingly, the Chinese government encourages the development of the projects belonging to energy industry.

Besides the project scope, the Chinese government should also provide guidance on project scale and operational models. Other countries, such as India, currently attract more small and medium sized projects than China. The role that small and medium sized CDM projects play in emission reduction should not be neglected, and the Chinese government could promote the development of these projects by employing a sectoral CDM approach and/or programmatic CDM approach.<sup>111</sup>

Moreover, CDM projects should be fully utilized to reduce the economic disparity in different regions of China. Impoverished regions in China abundant with favorable natural resource conditions could attract foreign investors to undertake CDM projects in these areas. In this regard, the Chinese government should pay attention to the geographic distribution of CDM projects and encourage the development of CDM projects in these regions. Local governments in particular are supposed to assist in identifying and implementing the CDM projects according to their local circumstances.

#### (3) Management of CDM projects through financial measures

In addition to the above measures, the Chinese government could mitigate the negative impact of implementing CDM projects on sustainable development in the long term through the adoption of financial measures and incentives.

111. The scope of the CDM will be expanded and be more flexible. Program activity and sectoral approaches have been included in CDM projects and nuclear, deforestation, or carbon capture and storage projects are under consideration. A program of activities (PoA) is a voluntary coordinated action by a private or public entity that coordinates and implements any policy/measure or stated goal, i.e., incentive schemes and voluntary programs, that leads to anthropogenic GHG emission reductions or net anthropogenic GHG removals by sinks that are additional to any that would occur in the absence of the PoA, via an unlimited number of CDM Program Activities (CPAs). Sectoral CDM is an approach where emissions reduction credits are generated from public and private actions in a single sector or subsector that reduce emissions below the level that would have occurred without the project. For more details, see Decision 7/CMP.1, *Further Guidance Relating to the Clean Development Mechanism*, ¶¶ 20, 97, UN Doc FCCC/KP/CMP/2005/8/Add.1 (2005), and Christiana Figueres, *Sectoral CDM: Opening the CDM to the Yet Unrealized Goal of Sustainable Development*, 2 INT'L J. SUSTAINABLE DEV. L. & POL'Y 12 (2006).

It has intervened in the CDM market by imposing a tax on proceeds from the transfer of CERs.<sup>112</sup> In addition, the Chinese government could adopt favorable financial policies for the developers of the CDM. These policies could include preferential import duties, income taxes, and loans for this type of CDM project.

### C. Legal Strategy for CERs

The Chinese government could also mitigate the limitations of the CDM in promoting sustainable development in China over the long term by creating an appropriate legal framework. As mentioned earlier, the current Chinese legal system has not clearly defined the legal nature or ownership issues of CERs. However, in light of efforts to reduce GHGs and the possibility of carbon trading in the future, it is necessary to ensure the legitimate interests and rights of affected parties.

First, the legal nature of CERs needs to be clarified. The Chinese legal system has given little consideration to clearly defining the legal nature of CERs. Viewed practically, however, the Chinese legal arrangement takes a property-based approach to environmental protection. That is to say, the right to CERs is also considered to be a property right.

The traditional analysis in the environmental legal regime is between private, public, and common property rights, which are mainly divided based on different owners. Private property right refers to ownership by individuals, while public property right refers to ownership by a governmental body. Common property rights in an environmental legal regime is a principle according to which the environment or resources are held indivisibly, rather than in the names of the individual members or by the government. Thus, rather than being owners of the environment and resources, its members are held to be trustees of them for future generations. Some scholars argue that clear and full ownership rights should be given to CDM project owners and meanwhile safeguarding Chinese national interest by holding back a specific proportion of CER from each CDM project in order to reduce the high investment risk for foreign investor.<sup>113</sup>

However, the inevitable response has been the imposition of some regulatory control on behalf of the citizenry and in restraint of any potential abuse of a commercially privileged position.<sup>114</sup> State intervention has silently generated a novel species of property—a category of regulatory property—that stands the traditional paradigm of private property on its head.<sup>115</sup> In this intervention of the property norm, an overriding control over specific categories of vital resource—let us call this control a form of regulatory property—is confirmed to the public, who, by force of con-

sumer choice, can determine whether, how, and by whom a resource may be exploited.<sup>116</sup> The regulatory property is with government agencies allocating and managing inalienable rights.<sup>117</sup> Actually, most property rights markets today trade in regulatory property, rather than private property.<sup>118</sup>

In the case of China, the regulatory property rights regime is a more appropriate model. Establishing a regulatory property right for CERs may be a great benefit to sustainable development in the long term. Taken individually, the CER means enormous amounts of money to CDM project owners. When establishing a private property right in CERs, it would be possible that the eligible CDM project companies, with their “Economic Man”<sup>119</sup> attribute, could pursue the maximum economic profits brought by selling CERs, regardless of the environmental aspect of developing the CDM projects. Although the projects need to be approved to meet Chinese sustainable development criteria and to meet the CDM rules, the project owners may be doing this for the sake of getting project approval, with the purpose of making money rather than considering environmental impacts. As a result, they may have a tendency to sell the emission reductions from CDM projects, rather than use the revenue to promote technological innovation. Therefore, the Chinese government should play a significant role in balancing the advantages and pitfalls of implementing CDM projects and the carbon market. In this scenario, it is necessary and reasonable to establish the regulatory property right in CERs in China.

Based on the above reasons, CERs should fall within a regulatory property rights regime. First, the emission reduction resource should be clearly delineated to be owned by project owners. Second, in order to avoid negative effects caused by pursuing maximum economic benefit and to balance the public and private interests, regulatory property rights in CERs should be established. Under such a circumstance, the project owner is the seller, while the Chinese government represents the whole people to allocate and manage the emission reduction and determine whether, how, and by whom a CER may be exploited. Based on that, the Chinese government could allocate the revenues from the transfer of CERs.

112. See *supra* note 61, art 24.

113. See, e.g., Tobias Koch, *Proposal for Further Development of Chinese CDM Rules*, Presentation to the Conference on Financing Renewable Energy Projects in China, Brussels, May 19-20, 2005, available at <http://www.erec.org/projects/finalised-projects/building-res-in-china/conference.html>.

114. Kevin Cray, *Regulatory Property and the Jurisprudence of Quasi-Public Trust*, SINGAPORE J. L. STUDIES 58, 82 (2010), available at <http://law.nus.edu.sg/sjls/articles/SJLS-Jul10-58.pdf>.

115. *Id.*, at 58.

116. *Id.*, at 66.

117. Bruce Yandle, *Grasping for the Heavens: 3D Property Rights and the Global Commons*, 10 DUKE ENVTL. L. & POL'Y F. 13, 30 (1999), available at <http://www.law.duke.edu/Journals/10DELFPYandle>.

118. *Id.*, at 16.

119. Economic Man is a term used in classical economic theory denoting the individual's rational deployment of labor or resources in the marketplace, in systematic pursuit of his or her own self-interest.