

“WALKING ON TWO LEGS” TO THE ACCREDITATION OF CERS?

AN INSTITUTIONAL ANALYSIS OF CDM IN CHINA

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1. Introduction

Climate change is dominating the environmental agenda's at least since the mid 1990s, first especially in developed countries but increasingly around the world. A wide variety of strategies and measures has been and are being proposed and implemented, at different scales. Many of these measures and strategies have a clear nation-state focus, as nation-states remain the main categories and platforms for designing, implementing and 'governing' climate change. However, some measures and strategies move beyond the 'nation-state container' (Beck, 2005) and follow a different logic in combating climate change. The so-called flexible mechanisms, proposed under the Kyoto protocol, seem to belong to this latter category. The Clean Development Mechanism has been the most important flexible mechanism.

The Clean Development Mechanism (CDM) was launched in 1998 and was operationalised in 2000. Under the CDM industrialized countries pay for projects that cut or avoid emissions in less developed countries, by buying Certified Emission Reductions CERs (1 CER equals one ton of CO₂ equivalents) that can be applied to meet their own greenhouse gas emission targets. The CDM has created the first global market mechanism in international environmental law and as such has spawned a market in a regulatory commodity that is worth millions of dollars (Steck and Lin 2008). The Executive Board (EB) is the international regulatory agency for the supervision of this market. Its role was stipulated in Article 12 of the Marrakesh Accords, i.e. to oversee, as an independent governance body, the implementation and administration of the CDM, develop procedures for the CDM, accredit Designated Operational Entities (DOEs), register projects and issue CERs. Hence, with the CDM a new hybrid institution is created, in-between state and market and in-between national and global.

In less than 10 years the Clean Development Mechanism has developed into an institutionalized global trading mechanism and practice. Entities in recipient countries benefit from the infusion of advanced technology and investment that allow factories or energy generation plants to operate more efficiently and/or clean. Moreover, it rewards developing countries for reducing emissions, without punishing them if they fail to do so. The CDM is thus widely perceived as a win-win mechanism, allowing developed (annex 1) countries to cut greenhouse gas emissions cheaply, while developing countries gain in economic and technological development. Estimations of the global CER supply potential for the first commitment period (2008-2012) range between 1.4 and 1.7 billion, while projections of global requirements to meet Kyoto targets range between 1.8 and 3.3 billion CO₂ equivalents (Sikorski, 2009; Michaelowa, 2008; UNEP Risoe Center 2009).

But the Clean Development Mechanism has also raised criticism of various kinds. Some argue that most CDM projects would also have been implemented without CDM incentives, questioning the current use of the additionality criteria and claiming that most CERs are ‘hot air’ (Haya, 2007)¹. Criticism is also targeted to the verification and control capabilities of the current institutional lay-out for such a complex global carbon market. Wara (2007) claims that CDM directs investments mainly to the ‘low hanging fruits’ such as end-of-the-pipe hydrofluorcarbon projects, leaving the less profitable and more valuable multiple-goal projects (such as on renewables) for the developing countries after the CDM period.² Michaelowa and Jotzo (2005) point to the substantial transaction costs involved with baseline development, project registration, verification and certification, especially for small scale projects, making CDM a cost-ineffective arrangement. Others have pointed to the conflicts of interest of especially validators of CDM projects: as they are paid by project they would have little incentives to stringently apply validation criteria (Haya, 2007). Stern (2008) criticized CDM for its emphasis on projects, and not focusing on sector-specific efficiency targets and sector-based decarbonisation plans, which could more easily enlarge annual carbon revenue flows.³ Wara and Victor (2008) make a similar plea for programmatic CDM; but they also criticize CDM for preventing other involvements and commitments from Non-annex 1 countries to the Kyoto Protocol. Little attention has furthermore been given to the design of complementary national policies relevant for the uptake, development and implementation of the CDM (Minang et al. 2007). A number of authors conclude that for these reasons CDM should be seen as an inefficient instrument to combat global warming (Tollefson, 2008; Wara and Victor, 2008), and even that the legitimacy of CDM is at risk. Hence, during the preparations of the Copenhagen COP (2009) CDM is one of the main discussion points and its future beyond 2012 is uncertain.

This paper wants to deal with part of this criticism by asking how the new institution CDM may be integrated into or complementary to existing institutions. The interaction of the CDM institutional structures in a host country with existing institutional structures will, as we will show, critically determine CDM project assessment. While the implementation of the CDM foresees standardized procedures to be applied in all hosting countries, states are free to decide the institutional design of their Designated National Authority (DNA), i.e. the agency responsible for overseeing the implementation of the CDM nationally, specifying selection criteria for projects, appraising them and granting approval. Ganapati and Liu (2008) correctly observe that the role of DNAs has hardly received any attention in CDM reviews. Given the states’ independence in setting up DNAs, institutional designs for DNA’s differ across states. National governments may favor institutional innovation with the setting up of a DNA, i.e. by designing a new organization, or they may incorporate the DNA in existing institutional structures. With the choice for the structure, governments also define through which national level institutional structures the CDM is transferred to a project level and in this way provides the institutional environment for CDM

¹ In China most CDM projects are on hydropower, and most CDM hydropower projects are in China. While hardly any hydropower project is now build without CDM (and even many hydropower projects already under construction ask CDM registration), there is no increase in hydropower projects after CDM has been installed. This criticism of International Rivers (cf. Haya, 2007) has definitely played a role in the fact that its site is blocked in China.

² That seems to have changed more recently as most governments have limited HFC projects and the amount of HFC projects and CERs in the pipeline are clearly decreasing (Wara and Victor, 2008).

³ This option is now further discussed in the preparations towards the COP in December 2009 at Copenhagen, but is rejected by China, especially when it takes the form of sectoral energy efficiency standards (Wang Can, personal communication, May 2009).

projects. However, the DNA is not the only institutional environment on the project level, other policies and institutions will further play a role in project implementation. This is especially the case for renewable energy CDM projects, with policies supportive to renewable energy development increasingly being devised in developing countries (REN21 2009). How then may these new policies interact with the CDM on a project level?

In the following, we will analyze DNA structures as well as CDM projects in order to learn about the relation of the CDM with host country institutions. For this analysis we focus on China, the country most successful in hosting CDM projects, providing an institutional structure that seems to be effectively mediating potential projects and CER buyers, receiving CDM related financial inflow and marketing CERs. Furthermore, from an institutional perspective, China is interesting since it has undertaken considerable reforms for the development of the renewable energy sector. On the level of the DNA, it could be assumed that it may take CDM as a further driver for reform. On a project level, synergies with renewable energy policies may exist.

We start with the presentation of assumptions for our analysis of CDM implementation which we derive from institutional theory (Section 2). After a brief introduction to China's general positioning in the CDM in Section 3, we will present the two institutional environments for CDM project implementation, i.e. the DNA and previous and contemporary policies and institutions for renewable energy (Section 4). Out of these two environments, we develop specified hypotheses on how they act upon projects. On the basis of Project Design Documents, we will, in Section 5, verify these hypotheses with empirical cases from hydropower and wind energy. The conclusion will focus on the question how the interaction of the CDM institutional structures with existing ones determines CDM project assessment.

2. Institutional analysis of CDM implementation

According to Keohane (1989), institutions are “persistent and connected sets of rules (formal and informal) that prescribe behavioral roles, constrain activity, and shape expectations” (Keohane 1989, 3). Different approaches have developed over time to analyse institutions (Hall and Taylor 1996). For the analysis at hand, we take from the Sociological and Historical Institutionalism since they focus on the interplay of organisations, their power and impact on institutions, as well as the historical context which they themselves provide, - processes which are deemed crucial to understand CDM implementation in China. Historical institutionalism defines institutions as “the formal or informal procedures, routines, norms and conventions embedded in the organizational structure of the polity or political economy” (Hall and Taylor 1996, 938). Institutions can range from the rules of a constitutional order or the standard operating procedures of a bureaucracy to the conventions governing trade union behaviour or bank-firm relations. Important is the constraining nature of initial policy choices, and the institutionalized commitments that grow out of them (e.g. procedures of a bureaucracy), which determine subsequent decisions. A central concept of Historical Institutionalism is path dependency which means that once a country has started down a track, the costs of reversal are high (Pierson 2004, 20). In positive feedback processes, the probability of further steps along the same path increases with each move down that path since outcomes in the early stages of a sequence feed on themselves. For policies, this means that “even when policy makers set out to redesign institutions, they are constrained in what they can conceive of by these embedded, cultural constraints” (Thelen 1999, 386). Furthermore, since only certain actors are in a position to impose rules on others, the employment of power may be

self-reinforcing. “Actors may utilize political authority to change the rules of the game ... to enhance their power. These changes may not only shift the rules in their favour, but increase their own capacities for political action while diminishing those of their rivals. And these changes may result in adaptations that reinforce these trends, as undecided, weakly committed, or vulnerable actors join the winners or desert the losers” (Pierson 2004, 36). By applying path dependency in a rigid manner, Historical Institutionalism runs the risk of being contingent and deterministic (Thelen 1999, 385). Thelen accordingly favours an understanding of institutions according to which they “continue to evolve in response to changing environmental conditions and ongoing political maneuvering but in ways that are constrained by past trajectories” (Thelen 1999, 387). Important for such an understanding are the “critical junctures” at which actors can choose the adoption of a new institutional arrangement. After the selection of a new option, it becomes progressively more difficult to return to the initial point when multiple alternatives were still available (Mahoney 2000). In the analysis of critical junctures, importance then needs to be given to the question what may sustain the institutional arrangements that emerge from these critical junctures, i.e. if power relations are reproduced.

Sociological institutionalism focuses on the interaction of organisations, or actors, and institutions. Of interest are processes of organizational change and the capacity of organisations and institutions to persist even after their original purposes have been achieved. In this regard, organisations and institutions can be mutually enhancing. While institutions are accumulated in organisations, institutions shape behaviour of organisations. Organisations are part of the reason why institutions are maintained over a long period of time without further justification or elaboration; organisations live on their existence. The resulting stability may either enhance organisational performance or decrease effectiveness if more efficient ways of organizing are ignored. Organisations are further crucial for the implementation of new institutions since the latter, through the incorporation by organisations, become common practice.

The CDM hence can be understood as such a new institution which needs an organization/s and institutional structure in order to be realized. The central question to any institutional analysis is how institutions do affect the behaviour of individuals or organizations? (Hall and Taylor 1996) Furthermore, extending this question with the focus on the interaction between institutions and organizations by Sociological Institutionalism, the second, related question is how may the implementing organisation have an effect on the definition of a new institution? Moreover, with the implementation of a new institution, the interaction with existing institutions and their implementing organisations becomes important as well as how such interaction may influence the outcomes of the new institution (Corbera and Brown 2008). We accordingly assume three different kinds of interaction. In all cases, the new institution was devised to create structures which bring about outcomes which are additional to outcomes brought about by the existing institutional structure. In a first case, the implementing organisation would be set up independently from existing organisations. Its power in relation to these organisations, operating in similar realms, would be crucial in the implementation of the new institution. If the organisation implementing the new institution is powerful, it can use the new institution to reinforce its power. In a second case, the institution is realized by an existing organisation. Two scenarios can be distinguished, one in which the new institution is supplemental to existing ones which are also brought into effect by the organisation. The organisation may incorporate the new institution into its procedures, which may result in synergies with other institutions and resulting changes in institutional structures, as well as changes in the organisation (e.g. change in operational procedures). In such a case, the outcomes from the new institution may be less

distinguishable than in the first case. In a second scenario, the new institution is taken in and “absorbed” or overlaid by the existing institutional structure which joins in the organisation. In this scenario, additional outcomes may be reduced to a minimum.

These assumptions will be considered for two institutional environments with which the CDM interacts: the CDM implementing agency and its institutional CDM structure on the one hand and accompanying renewable energy policies on the other (see Sections 4.1 and 4.2). At the end of each section assumptions will be derived relating to above described interactions. Before going to the analysis part, we will first, in following, briefly review different institutional types of DNAs that will help us to assess China’s institutional CDM set up against other existing models. The section will conclude with a reflection on the understanding of “additionality” from an institutional perspective. This part is important for the later empirical part on CDM projects.

2.1. Institutional designs for DNAs

Institutional designs for DNAs are important for an effective implementation of the CDM. The development of effective institutions is important to compete for and benefit from CDM investments (Michaelowa 2003). Michaelowa claimed that the optimum institution will be a CDM office that is independent from governmental agencies but has full approval powers. Such a structure is supposed to endure changes in the political situation of the host country as well as to be able to sustain a permanent staff, both criteria being considered crucial for reducing uncertainties for investors and the success for CDM (Michaelowa 2003, Morera et al. 2003). However, independent agencies may lack a clear legal foundation that entitles them to confer national CDM approval (Morera et al. 2003). Furthermore, countries may not take the risk of setting up institutional infrastructures when they are uncertain about foreign CDM investments. Simple DNA structures, as well as structures building on existing institutional capacity may in this case be better suited (Winkler et al. 2005).

Literature (Lee et al. 2004; Winkler et al. 2005; Ganapati and Liu 2008) differentiates the following types of DNA institutional structures. Analyzing China’s CDM implementation along these types will help to position it in the overall context of national CDM realization.

Under the “single government department model”, one, most likely environmental, department or ministry undertakes all the activities of the DNA. However, upon demand, it will invite technical experts from other government agencies/ministries. According to the “two-unit model”, functions shall be separated across two independent departments. This structure takes into consideration potential conflicts of interests like, for example, for the formulation and approval of projects (Lee et al. 2004), or differences in the organizational capacities of departments, as for example in their regulatory and promotion functions (Winkler et al. 2004; Ganapati and Liu 2008). In the latter case, one unit evaluates and grants projects and may be placed in a governmental department dealing with sustainable development, e.g. of the environmental ministry. The second unit engages in investment promotion, developing a portfolio of CDM projects for marketing to investors, capacity building and outreach. It may best be affiliated with a department dealing with FDI. The “inter-departmental government model” foresees a structure in which all relevant government departments are integrated into the DNA as permanent members, being responsible for project approval, while one ministry, e.g. the ministry of the environment, may act as the coordinator. The “FDI-piggyback model” highlights the investment nature of the CDM. CDM activities are overlaid on an existing structure which overlooks foreign direct investment (FDI). The advantage of hosting CDM in agencies already dealing with FDI is that it can reduce

operation costs as well as that the FDI office can promote the CDM along with its other investment promotion activities. In the “outsourcing model” then, a private agency evaluates projects and reports to a government agency that plays the role of the DNA.

For the case of Africa, Winkler et al. (2005) suggest that the institutional effort required to get the CDM working shall be proportional to the size of the task, and the scale of expected benefits. For African countries, they suggest that little of total CDM investment may flow to Africa, which is why they consider a strategy of building on existing institutions a better approach, i.e. the FDI-piggy-back model or the single-department model. The “inter-departmental government model” can be found in India, Brazil and Mexico, which are among the countries leading in the number of CDM projects⁴.

2.2. Institutional understanding of “additionality”

As indicated in Section 2, the additional outcomes of a new institution may be considerably lowered when implemented by an organization that overlays the new institution by existing ones; the additional outcomes may be less distinguishable when realized by an organization that looks for synergies with existing institutions; and the outcomes may depend on the power of the organization against other organizations in the same realm. From an institutional perspective then, the “additionality” that is generated in the frame of a new institution becomes questionable.

Additionality determines whether a project should be awarded carbon credits that can be used by the Annex I country to meet its Kyoto commitments. The Kyoto Protocol defines additionality as the reductions in emissions that are additional to any that would occur in the absence of the certified project activity (Kyoto Protocol, Article 12.5(c)). In the annex of the Marrakesh Accords, it is stipulated that a “CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (Marrakesh Annex Article 43). In a strict implementation, carbon credits only are given to those projects that cannot be implemented without CDM; projects that could be carried out as regular business Business-As-Usual accordingly are disqualified.

From an institutional perspective, additionality is a relational term in the sense of “additional to the outcomes from current institutional structure”. Projects in countries with a weak institutional structure for the implementation of carbon reduction policies will have it easier to prove their additionality than those projects in countries where governments already have drafted policies, institutions and set up organizations for the mitigation of CO₂ emissions. In this sense, the weaker the institutions for renewable energy are, the more likely the project is additional. The existence of complementary policies hence defines whether projects are additional or not, or, stated in a different way, additionality points at lacking supplemental institutional structures. If local know-how can be used for the development of projects, and no technology transfer is required, local institutions are reinforced and not made dependent on external monetary flows. However, since no technology transfer is required, the project loses its argumentative power for “additionality”. The reinforcement of local institutions however far more “adds up” to the building of carbon reduction institutional structures. China has been questioned regarding the additionality of its CDM projects (Wara and Victor 2008). Through tracing back the institutional environment of CDM application, we will in the following analyze in how far this lack of additionality is “housemade”, i.e. due to China’s previous efforts in promoting renewable energy.

⁴ CDM Market Brief Mexico, Brazil and India, <http://www.gtai.de/DE/Navigation/Spezialthemen/CDM-Markt/cdm-markt-node.html>

3. China and the Clean Development Mechanism

Per May 2009 over 1600 CDM projects were registered at the UNFCCC, almost 1000 were requesting registration, while another 4200 were in the pipeline. Annual average CERs per May 2009 ran up to almost 300 million. Prospects for the end of 2012 were 1600 million CERs. In its short history (since the Kyoto protocol came into force in 2005) CDM has leveraged almost twice as much funding for projects as the Global Environmental Funds did since 1991. The countries involved in CDM business are not equally spread around the world. Figure 1 illustrates from which countries the main investors in CDM come. Figure 2 pictures the distribution of CERs among the recipient countries. While western Europe is the main location of investors, China and India are the main recipients of CDM investment, both in terms of amount of projects and in terms of CERs.

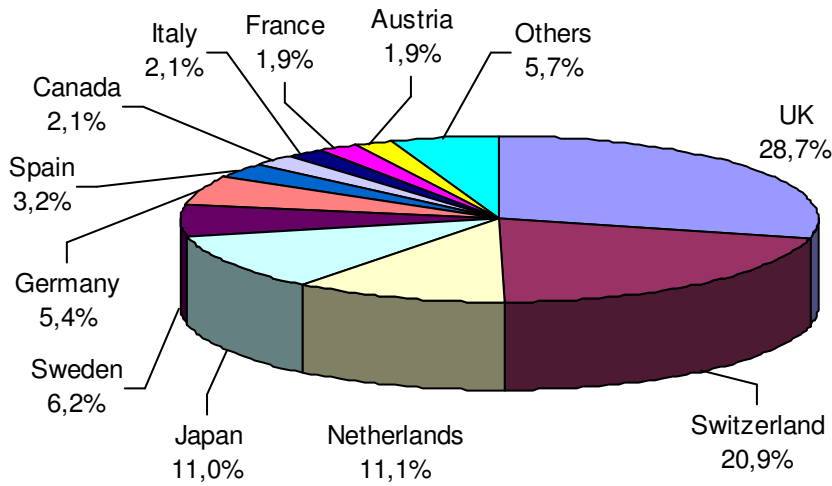


Figure 1: Registered CDM projects among Annex 1 and non-Annex 1 countries per May 2009 (Source: <http://cdm.unfccc.int/Statistics/index>)

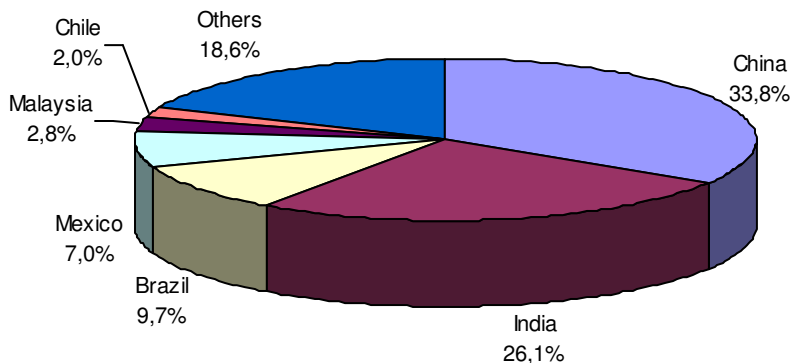


Figure 2: Registered CDM projects by recipient countries per May 2009 (Source: <http://cdm.unfccc.int/Statistics/index>)

China is the major recipient of CDM projects, with over 2,000 projects approved, 550 projects registered at the UNFCCC and 185 million CERs annually of these registered projects by May 2009. The fact that China leads the list of recipient countries for CDM projects might be surprising at first sight, as up till recently China has not been frontrunning in international environmental agreements and activities. As a non-annex 1 country, China has repeatedly insisted on the responsibility of developed (annex 1) countries in combating climate change. China's 2007 National Climate Change program further stresses that climate change is primarily an issue of development, and that China's actions and measures will depend on the resources made available by developed countries. CDM fits nicely in the basic strategy of equity and common but differentiated responsibilities, which China has always endorsed in international climate change policy negotiations. But there are a number of other reasons why it should not surprise us too much that China leads in hosting CDM projects. As the second largest energy consuming nation, the largest energy-related carbon-dioxide emitting country, with a very energy inefficient economy and major energy related environmental and health problems, China has major opportunities to profit economically (via technology transfer and foreign economic investments), environmentally and politically from CDM projects. Moreover, if we understand the economic nature of CDM, emission trading fits in the opening up of China to the international economy, especially since its membership to the WTO in 2001.

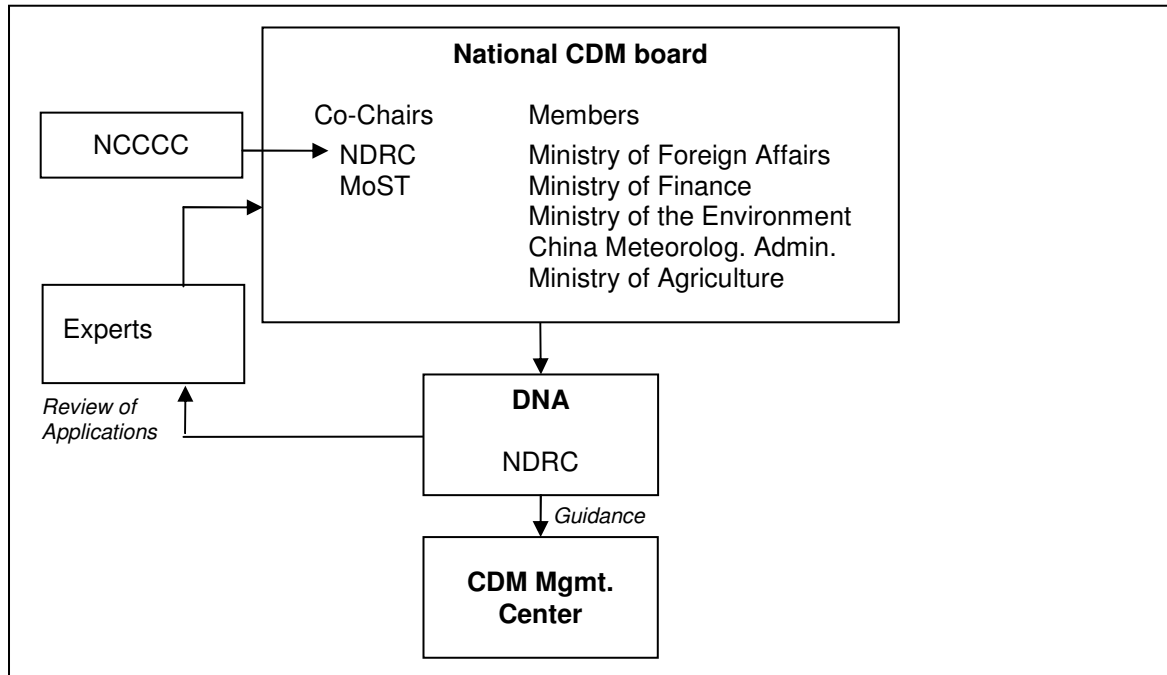
CDM has brought additional FDI capital to China, specifically in the area of energy innovation. The total is estimated to rise to 0.2-0.3% of total inward bound FDI by 2012, marginal in terms of FDI but more substantial in terms of foreign investment in energy. Some even believe that there is limited foreign investment in renewable energy in China outside CDM. Whether this will continue in the future is dependent on the continuation of CDM after 2012 and whether China will still be seen as a developing country at that time. CDM projects do focus on the most cost-effective CER credits, and may leave China with the more expensive CERs after 2012. This can result in a major set-back in renewable energy investments after 2012, if China can no longer profit from FDI in energy innovations. Hence, we see that the Chinese government constantly focuses on two things: stress article 4(7) of the Climate Change Convention, and stress the need for technology transfer in the CDM system. The main aim of China is “that CDM, as a comparatively effective and successful cooperation mechanism, should continue to be implemented after 2012. However, efforts should be made to promote fairness, transparency, simplicity, certainty and environmental completeness during the implementation of projects, and to encourage the transfer of advanced technology to developing countries” (NDRC, 2008). CDM has become the key preferred mechanism for China to work under the Kyoto protocol (certainly compared to mandates). It uses its active role in CDM to downplay any international discussions on obligations for the second phase after 2012, whether it is on sectoral plans or caps.

4. China's CDM and renewable energy policy and institutions

In this section, we will present the two different institutional environments for CDM implementation in China, i.e. the structures through which the CDM is implemented (Section 4.1), and the institutions which have been existing before the CDM and may interact with it on a project level (Section 4.2). At the end of each section, hypotheses will be drawn regarding which effect these structures may have on CDM, using the general assumptions developed in Section 2.

4.1. CDM policies and institutional structure

Various national and international studies identified at an early stage a broad portfolio of eligible and economically interesting CDM projects in China (Cf. Zhang, 2000; World Bank 2004). After some initial hesitations to participate in emission trading (Heggelund, 2007), China developed rapidly and smoothly a supporting institutional framework for promoting CDM in the early years of the new millennium⁵.



(composed out of Zeng and Yan 2005, Tulyasuwan 2008, Ganapati and Liu 2008)

The NCCCC (National Coordination Committee on Climate Change) is the leading national supervising and coordinating agency for all climate change policy and measures, including CDM, and is responsible for policy making and coordination of CDM-related issues. It has its secretariat at the Climate Change Department of National Development and Reform Commission (NDRC) and is headed by the chairman of the NRDC (Ganapati and Liu 2008). The NRDC is a macro-level central agency under the Chinese State Council. Its mains tasks are to formulate policies for economic and social development, maintain the balance of economic development and guide the restructuring of China’s economic system. However, as we see from the above figure and as will be explained in the following, the NDRC hosts far more functions than economic development only.

The NCCCC is responsible for the review and coordination of important CDM policies, rules and standards as well as approving members of the CDM Board. The CDM Board accordingly is established under the NCCCC; it needs to report to the Committee on the overall progress of CDM project activities. Under the NCCCC the National CDM Board has developed regulations and procedures for the operation and management of CDM projects and for reviewing and

⁵ Countries have been ranked annually according to their CDM investment climate and China has moved from an initial bottom line position to one steady among the top (second in May 2009, behind India; see www.pointcarbon.com).

approving CDM applications. In 2005 the NCCCC launched the “Measures for Operation and Management of CDM Projects in China” to regulate the legal modalities of CDM implementation in China.⁶ One of the major objectives of these measures is to balance the economic and sustainability goals of CDM.

The national approval system for CDM projects in China is dynamic, predictable and transparent (Heggelund, 2007: 182). The national CDM board is composed of five ministries / agencies, and co-chaired by the NDRC and the Ministry of Science and Technology (MoST). It is responsible for reviewing and approving CDM project proposals. The NDRC at the same time operates as the DNA. Project applications are directed to the NDRC who invites independent experts to review the project documents. The DNA checks proposals on; (i) consistency with China’s laws and regulations, its sustainable development strategy and policies, and the overall requirements for national economic and social development planning; (ii) requirements of the UNFCCC, the Kyoto protocol and the agreements made at the COPs on transparency, accountability and efficiency; (iii) absence of introduction of new obligations; (iv) promotion of environmentally sound technology transfer, in particular in the governmental priority areas of energy efficiency and renewable energy; (v) absence of funding from ODA or from resources earmarked for other Convention-related financial obligations in the investors country. In addition, the contribution of projects to economic development, poverty reduction and other environmental goals, as articulated in the 2007 National Climate Change Programme, is emphasized. Project Documents and expert comments are sent to the National CDM Board which takes a decision. If positive NDRC prepares a letter of Host Country Approval, after which the project needs to be registered with the Executive Board. Then follows verification by a Designated Operational Entity, certification by the Executive Board and finally the CERs are issued. Tasks on a project level are taken over by the CDM Management Center which works under the guidance of the NDRC. It receives material for project application, does an initial review of Project Design Documents (PDDs), organises experts, maintains the project database, develops China’s CDM information system and is responsible for capacity building work.

From this overview of the institutional set up for national CDM implementation, we could conclude that China follows the inter-departmental governmental model with a CDM board of ministries and one agency as the Secretariat. However, the NDRC dominates the structure with its Co-chair in the CDM board, its power of approval of board members, and its role as the DNA. Furthermore, according to Article 25 of the Measures, The NDRC is, in consultation with MoST and the Ministry of Finances, responsible for the interpretation of the Measures. Moreover, the head of the NCCCC, the organization responsible for devising climate policies, at the same time is the director of the NDRC.

With the NDRC at the center of the CDM, China has ensured that CDM projects remain in line with the national priorities on energy security, sustainable development and climate change mitigation as formulated in their Five Year Plans and various laws. In regard to energy, the functions of the NDRC include the approval of major power projects, formulating plans for the development of the energy sector, the coordination of energy saving and emission reduction within China and the organization of the formulation and coordination of the implementation of plans and policy measures of the national energy strategy, as well as promoting a sustainable development strategy. The NDRC is crucial for the implementation of the government’s targets of

⁶ National Coordinating Commission on Climate Change (2005), *Measures for Operation and Management of Clean Development Mechanism Projects in China*, Beijing: NCCCC.

increasing renewable energy supply. In the field of climate change, the NDRC coordinates governmental departments on climate change policies (together with the Ministry of Science and Technology and the Ministry of Foreign Affairs), participates in international climate change negotiations, carries out national strategy studies on climate change and formulates China's policies for international negotiations, administers international cooperation projects in the climate change field and organizes nationwide awareness raising and publicity on climate change (see Zeng and Yan 2005).

Apart from its involvement in the energy sector and climate policies the NDRC foremost is responsible for tasks of economic development. Its Department of Foreign Capital and Overseas Investment is, among others, responsible for analyzing the situation of foreign capital utilization, for devising strategies, plans and structural optimization of foreign capital utilization, as well as monitoring and controlling the total size of foreign liabilities and optimizing their mix. Together with relevant agencies, it drafts the Catalogue for the Guidance of Foreign Investment Industries. According to its mandate stipulated by the State Council, it examines and approves foreign investment projects in priority areas. Depending on the size of investment, the national or local NDRC is responsible for ratification. The NDRC hence reaches down to the provincial and local level, on which its officials are responsible for the examination and approval of foreign direct investment projects. They take the sole responsibility for smaller scale projects⁷. The local NDRC offices are required to review and examine all FDI applications taking into consideration, among others, their economic security, public interests, resource exploitation and environmental protection. Against previous claims that CDM project submission does not involve local governments (Zeng and Yan 2005) or that even provincial agencies would have little voice in the CDM process (Ganapati and Liu 2008), Article 18 of the Measures explicitly states that relevant departments and local governments may facilitate project application. In the “National CDM project Auditing Council's Meeting Notifications”⁸, the local NDRC is explicitly mentioned as one of the entities involved in the application procedure⁹. The local level does of course check projects against national NDRC standards and in this regard plays a crucial role for policy implementation. However, it at times takes a consultative role for the national level NDRC in the drafting of new plans, such as for a recent plan to increase financial assistance for renewable energy projects¹⁰. Provincial and local NDRCs take an active role in the propagation of renewable energy in general, they take part in international fairs for the finance of renewable energy, and some provinces, such as Hebei and Shanxi, maintain own CDM websites¹¹. Since renewable energy offers them the possibility to obtain tax revenues and satisfy local energy demand, local governments at times, in their drive to attract investment, do not act in line with national orders¹².

⁷ “Encouraged” or “permitted” category projects, where the total investment is below US\$100 million and “restricted” category projects, where the total investment is below US\$50 million must be ratified by the local NDRC; of these, “restricted” category projects must be ratified by provincial-level NDRC, and this ratification right cannot be delegated down to the lower level bodies. Source: Chinalawinfo

⁸ “国家清洁发展机制项目审核理事会第XX次会议会议通知”, which are regularly updated on the governmental CDM webpage.

⁹ 请国家清洁发展机制项目审核理事会各成员单位准时出席, 项目申请单位与地方发改委按上述顺序出席。/待会的项目申请单位与地方发改委请到国家发改委中配楼第五会议室待会。

¹⁰ Xinhua (2009), “China's State Council to discuss stimulus plan for new energy industry”, Xinhua, May 23, 2009.

¹¹ <http://www.sncdm.com/>; <http://www.hebcdm.gov.cn/>

¹² See Wang, T. (2006), “Update: State Council criticizes illegal power construction in Inner Mongolia. China Environmental News Digest, Friday, August 18, 2006.

Concluding, with the NRDC's focus on economic development, including foreign direct investment, and with its dominance in the CDM Board and as DNA, as well as with its key functions in climate and energy policy, the CDM institutional structure in China appears as a mixture of the FDI-piggyback model and a lean inter-departmental government model. Being implemented with the NDRC first of all means that the CDM can be maintained as an institution and does not have to fear neglect within national institutional structures. However, for one, the NDRC has been criticized for promoting CDM projects that conform to only broader goals of climate change mitigation and sustainable development, and for passing over an explicit definition of sustainable development indicators (Ganapati and Liu 2008). With its focus on economic development, coupled with its dominance within the CDM institutional structure, it can be assumed that the NDRC may narrow down the CDM to its economic functions of FDI attraction. According to Article 25 of the Measures, the NDRC is the leading agency responsible for the interpretation of the Measures for Operation and Management of Clean Development Mechanism Projects in China. Among the three different assumptions devised in Section 2, the assumption seems most suited according to which the new institution CDM, the scenario seems most likely in which the new institution is adapted and “absorbed” in the existing structures and procedures of FDI. With the NDRC overseeing both renewable energy projects as well as demands from the international carbon market, it can be assumed to be a crucial knot for channeling CER flows. We hence assume that its incorporation into the NDRC may help the CDM to piggyback on the extensive institutional structure of the NDRC, reaching down to the local level, while at the same time being narrowed down to its economic functions.

4.2. Renewable energy policies

An increasing number of national laws and policy documents have been devised in the energy sector, among which the law on energy conservation (2000), the China Medium and Long-term Energy Conservation plan (2005), and a great number of provincial and local policy initiatives on energy conservation and renewable energy. The 11th Five-Year Plan (2006-2010) set as one target the increase in renewable energy supply, with the renewable energy law taking effect in 2006. This close linkage between existing national (energy) plans and policies and international CDM policies cause Wara and Victor (2008: 13) to criticize the additionality of current Chinese CDM projects in the area of hydropower, wind and natural gas. According to the Chinese government, however, planning targets are not legally binding, which is why renewable energy projects are considered additional¹³.

The most important instrument for renewable energy policies is the Renewable Energy Law. It includes mainly general guidelines for the deployment of renewable energy and in this has given renewable energies strong political support. It remains vague regarding implementation responsibilities and financing.

As we will show, most of the CDM renewable energy projects are hydro power or wind energy projects. For wind power, the concession law for wind power that has been issued in 2001 already, has been important for the support of the national wind energy sector. The law makes public tendering of certain types of wind power parks mandatory which has, due to a price race down to the bottom, put off international investors, resulting in Chinese companies gaining

¹³ CDM & JI Monitor (2007), Chinese official defends additionality of renewables in CDM, *Point Carbon*, 21 March 2007.

ground in the market. However, this development occurred together with the local content requirement according to which 70% of wind power plant technologies need to be supplied by local companies. We can assume that this regulation has considerable impact on technology transfer within CDM.

For the other major renewable energy CDM project category in China, hydro power, technology transfer can also be assumed to be limited. From the founding of the Republic, the opening up of rural energy resources played a considerable role for rural economic development, productivity increases and the improvement of living standards in rural China (Yu 2007). China has been promoting rural electrification through decentralized energy systems from the 1960s on, and in this frame, rural communities developed hydropower from 5MW of total installed capacity in 1949 to 520 MW by 1960 (Yeh and Lewis 2004). The 63,000 small hydropower plants installed by 1988 provided the power requirements of one-third of China's rural counties and 40 percent of its county owned industries (ibid.). In the 1960s, the importance of rural electrification was early highlighted in the “agricultural development outline” (nongye fazhan gangyao) according to which all regions with water resources should develop small hydropower projects in order to progressively respond to rural electricity demand. In the frame of the policy “walking on two legs”, rural electricity stations were understood as complementary to the development of a national electricity network. The policy "walking on two legs" placed equal emphasis on the development of the urban and rural sectors and on modern and traditional methods for development (Lo et al. 1977). In 1963, at the national electricity conference, this need for a simultaneous development of electricity networks and rural small scale projects, was reinforced (Yu 2007). In the end of the 1960s, the government issued the economic guideline “to use agriculture as a basis and industry as a leader” (yi nongye wei jichu, gongye wei zhudao) and decided to further promote food and commodities production in the rural areas, in this way making rural electrification even more important. In the 1970s, the electricity demand from rural industry increased rapidly, while the further construction of small hydropower stations slowed down. This mismatching development led to a policy adjustment resulting into the devolution of electricity management to the respective local government and population in order to keep them motivated in hydropower project construction (Yu 2007). In 1979, the national science conference promulgated that rural energy shall be realized through efforts of rural areas. At that time, schools and research units for rural energy were set up for the extension of knowledge on rural energy, among others also on the construction of small hydropower stations. Their founding should provide the scientific basis to rural development. There hence may be considerable expertise with rural communities in the development of hydropower, which would imply limited technology transfer within wind and hydropower projects since technological expertise is not required.

For the renewable energy sector and its effect on CDM project implementation, we hence can assume that existing structures create synergies with CDM. However, measuring these synergies with the additionality criterion, projects would then be of limited additionality.

5. CDM projects in China

Chinese nationals, Chinese owned enterprises or enterprises with Chinese majority ownership within the territory of China are eligible to conduct CDM projects with foreign partners and are

qualified to submit CDM proposals.¹⁴ According to Zeng and Yan (2005), in practice, Chinese local enterprises will have priority over joint ventures since the latter involve a higher degree of complexity and uncertainty (e.g. in terms of defining CERs). Across projects, priority is given to projects in the areas of energy efficiency improvement, development and utilization of new and renewable energy, and methane recovery and utilization (which have 85% of the registered CDM projects in China, but only 29% of their projected CERs up till 2012; the majority come from N₂O and HFC projects). These priority areas have major spillover effects in terms of energy security, employment, local pollution reduction, and technological demonstration and transfer.¹⁵ The revenues accruing from the sale of CERs is shared by the Government of China and the project owner, quite unlike agreements in other countries. The percentage of the transferred benefit taken by the Chinese government reflects the priority area policy of the DNA: in case of HFC projects 65%, N₂O projects 30%¹⁶, and priority area and afforestation/reforestation projects only 2%. This also corrects the perverse incentive for ‘low hanging fruit’ projects. And these taxes compensate for the external costs imposed by CDM projects. Officially these revenues are put in a CDM Fund managed by the Ministry of Finance and earmarked for investment in climate change related projects in China. China’s policy strongly encourages both bi/multilateral and unilateral CDM projects. In case of absence of a foreign buyer for CERs after a project has been approved, the CERs generated will be transferred into China’s national account in the CDM registry and can only be transferred to a foreign purchaser with explicit authorization of China’s DNA.¹⁷

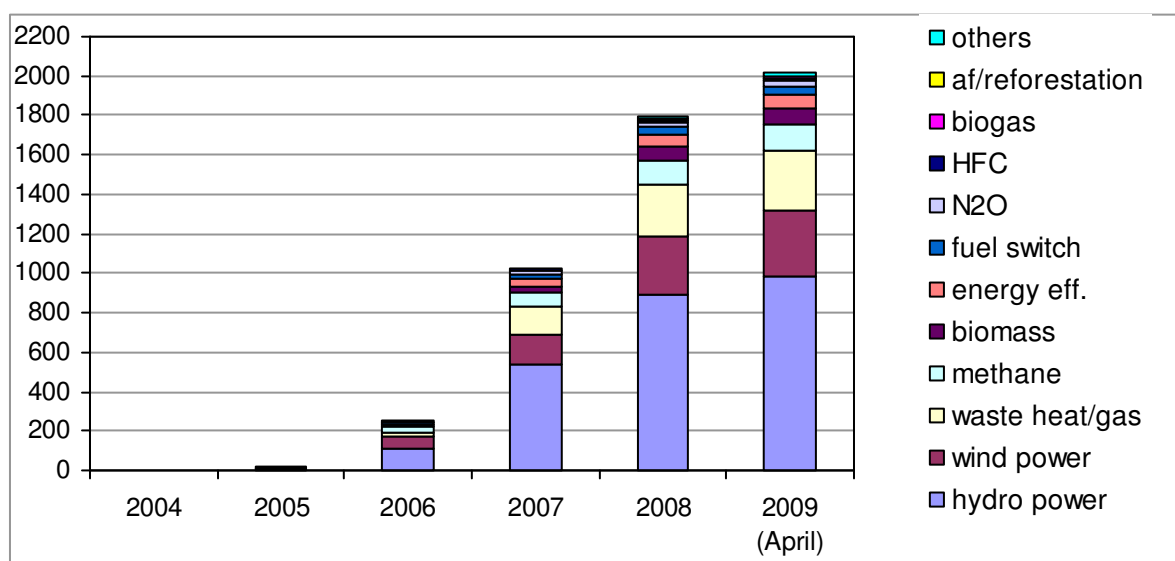


Figure 3: Number of CDM projects approved in China, 2004-2009 (cumulative) (Source: NCCCC data)

¹⁴ The exclusion of (majority) foreign owned companies should prevent the flow of money to abroad, give Chinese companies a comparative advantage and ensure that not only profit goals but also sustainability goals are safeguarded (Heggelund, 2007)

¹⁵ The focus on priority areas and sectors enhances the use of common baseline methodologies, which reduces transaction costs (Ganapati and Liu, 2008: 358).

¹⁶ These two areas were not seen as very sustainable by NDRC, despite their high value in terms of CERs. Sustainability then means the contribution to non-greenhouse gas emission reductions, economic development, energy security and poverty alleviation, goals prioritized by NDRC above GHG emission reductions.

¹⁷ This also happens when a contract with a foreign buyer is broken, for instance following sudden changes in CER prices or economic crisis as of 2008/2009 (interview Can Wang, Tsinghua University, May 2009).

After a slow start (with the first CDM project only approved by the DNA in late 2004) the development and implementation of CDM projects in China has been astonishing fast. Figure 3 shows that hydropower projects were crucial in these dynamics. From a share of 42% of all projects in 2006, they subsequently established around 50% of total project volume in China. This position of hydropower to some extent reflects its general popularity within the CDM. Small hydropower projects make the second most popular project type in the global CDM pipeline (Fenhann and Larsen 2006). The popularity of hydropower can be explained by its relatively mature technology, and, therefore, low risk for project developers (Winkel 2006). While most hydropower potential has been realized in OECD countries, small hydropower projects are being realized under CDM in India, Brazil and China. From this perspective, it could be assumed that buyers, and related project developers, drive towards hydropower projects within the CDM. Technology transfer can accordingly assumed to be taking place from the buyers' side. However, due to the development of hydro power projects in China from the 1960s on, we assumed that technology transfer may not be necessary.

The second largest project category are wind energy projects which as of April 2009 make 16.7% of all CDM projects in China. While the CDM is considered to have propagated the global deployment of wind energy¹⁸, investment activities are directed principally towards India, Brazil and China, the three exceeding 63% of the total number of projects (Georgiou et al. 2008). For the success of wind energy projects, adequate and stable public policies with a strong political commitment are considered crucial (UNDP 2008). In China, 90% of wind energy projects have applied for CDM registration. However, as described before, technology transfer may not be needed or even, according to the local content requirement, legally permitted.

CDM renewable energy projects

Corresponding to the distribution of registered renewable energy CDM projects in China, the sample comprises 13 hydropower and 5 wind energy projects. Based on this criterion of sample distribution, Project Design Documents (PDDs) were randomly selected. We will first show whether the NDRC plays a role in project start up, and then whether technology transfer took place. Then, we will show how the projects claim additionality.

First, however, briefly in general about the distribution of the sample. Sample wind energy projects are in general of larger scale than hydropower projects; they in average have an installed capacity of 54MW, which considerably differs to an average capacity of 18.8 MW for hydropower projects, 69% of which belong to the UNFCCC “small scale” category (projects with an installed capacity below 15MW). Accordingly, the average annual reduction in CO₂ is 59,222 tons for hydropower projects, while for wind energy a project on average reduces 129,040 tons CO₂ per year.

The PDDs showed that in nine out of 15 cases, the local government or NDRC proposed the project developers to apply for CDM. This may happen through a recommendation letter that the local NDRC issues to project developers, in which it recommends to apply for CDM to overcome financial barriers. Project developers may also by themselves approach the local government to ask for support for project development and CDM application. Other sources of information about the CDM were a private consultant and a bank. For four entries, it was not clear from whom the

¹⁸ <http://www.wind-energy-the-facts.org/es/home--about-the-project.html>, viewed August 2009

project developers obtained information. Summarizing, since investment projects have to be approved by the local, or even national, NDRCs, it appears that in the course of project implementation and especially in case of financial constraints, the local NDRC informs project developers on their eligibility for CDM. We see our hypothesis verified that the CDM institutional structure piggybacks on the institutional structure of the NDRC.

Also our hypothesis regarding technology transfer could be verified. Only in one of the 18 wind energy and hydropower projects, new technology was transferred from an Annex 1 country. In the one case, the wind turbines were made by a domestic joint venture and hence transfer took place “within the company”. None of the projects benefits from additional public funding, i.e. is incorporated in a framework of cooperation development programs.

With an implementing agency that recommends participation in CDM to overcome financial barriers, with constraints on technology transfer and with no clearly formulated assessment indicators for sustainability, the question arises how projects made their argumentation for “additionality”?

A project is “additional” when, given the respective socio-technical infrastructure, it would not have been implemented without CDM. That is, by proving additionality, PDDs uncover weaknesses within institutions for renewable energy projects. Analysis of PDDs identified the following institutions of importance: “demonstration projects” in renewable energy projects; the reform of the energy sector with its implications on grid prices; and a national decree which prohibits the installation of small scale fossil fuel energy plants. These institutions and their design made CDM projects additional. They will be further elaborated in the following.

The role of demonstration projects for renewable energy is highlighted in two ways: Projects consider themselves additional to “common alternatives” like other renewable energy resources than wind and hydro. They would not be commercially viable (4 / 13 responses for solar PV; 3 / 13 for biomass) since, for the case of biomass power generation technology, China would still be in the stage of research and development and demonstration projects¹⁹. It is concluded that projects could not be operated without support from the national policies and financial support²⁰. Additionality here refers to a lack of continued policy support in other renewable energy areas.

Projects further need to show their additionality in respect to similar projects (“common practice analysis”). The argumentation here refers to the financial risk of the project activity which distinguishes (in 3 out of 10 PDDs) the project activities from other projects that had been either developed by state-owned organizations (with larger capital reserves and better access to project finance²¹); or by pointing at their benefits from favorable power prices for projects with a demonstration purpose and/or subsidies and governmental soft loans for the purchase of equipment (windturbines) from foreign suppliers²². Project activities consider themselves not a common practice since they compare themselves with demonstration projects which benefited from favorable tariff conditions, subsidies or loans, or were developed by state-owned organizations. The projects hence are additional since they were not accredited the status of a demonstration project.

The argumentation for additionality comes mainly from the argumentation that projects would not be feasible under the current as well as potentially increasing grid prices. In their analysis of the projects’ Internal Rate of Return without CDM accreditation, in 18 out of 18 cases,

¹⁹ PDD Henan Sanmenxia 25.5MW Wind Power Project

²⁰ PDD Guohua Dongying Hekou 49.5 MW Wind Farm Project (Phase 1) & PDD Henan Sanmenxia 25.5MW Wind Power Project

²¹ PDD Guangnan Shangshilong Hydro Project

²² Huadian Inner Mongolia Huitengxile Wind Farm Project

project realization is not considered feasible. The Internal Rate of Return (IRR), a measure of the profitability of investments, in all cases remains below the benchmark of 8% and 10% respectively. In a second step, a sensitivity analysis is carried out to test whether the project is financially attractive under improved conditions such as increase in grid tariff. Even if all PDDs state that they would not be economically feasible under a grid tariff increase of 10%, out of 15 entries, 8 show an IRR that is only 1% below the benchmark, 6 of which are about half a percent below the benchmark. A general tariff increase of 10% hence would considerably increase the prospect of developing a project independent of CERs.

The energy sector reform here plays a considerable role for today's additionality. Before 2002, energy plants were developed by state owned enterprises, most of them were constructed with national or local government funds²³. The tariff for each power plant was determined by the principle of cost recovery. After the reform, power plants are encouraged to lower the costs for electricity generation and thus on-grid tariffs. The result is a downward trend in tariffs as well as planning uncertainty for project developers. Hydropower projects in the sample faced difficulties since a tariff in their Preliminary Design Reports was higher than the tariff at the time of negotiations with the grid company²⁴, or the tariff finally approved by the NDRC²⁵. In one case, the Preliminary Design Report used an electricity tariff that was 20% higher than that set in the Power Purchase Agreement negotiated with the grid company. In many PDDs, the variations in tariffs across time are given as the reason why the project owner applied for CDM. Without CERs, the activity would not have been financially feasible. In further two PDDs, it is concluded that without a higher supporting tariff or favorable financial support, further development of similar wind farms would face financial barriers and would not be feasible²⁶. Projects hence are additional since uncertain and low prices cannot make them financially viable. CDM provides them with reliable income streams.

As a third institution, the “Notice on Strictly Prohibiting the Installation of Fuel fired Generators with the Capacity of 135MW or below”, issued by the General Office of the State Council²⁷ (Decree No. 2002-6), needs to be mentioned. It channeled down private sector energy investment to renewable energy projects. With this Decree, the State reinforced its commitment to close down smaller scale fossil fuel plants, a policy which has been pursued since 1995. Since local departments and business had restarted to illegally construct small fossil fuel plants without permission, the decree was issued. Through the “135MW fossil fuel directive”, alternatives for the investment in the energy sector were hence channeled down to small-scale investments in renewable energy. At the same time, renewable energy projects get less financially feasible after the electricity sector reform in 2002. According to the project developers, even the issuing of the Renewable Energy Law would not contribute to fill the gap since there would be “no direct incentives such as financial grants, higher tariffs or subsidised loans available”²⁸. According to Article 25 of the Law, financial institutions shall offer preferential loans to renewable energy development. Article 26 of the Renewable Energy Law stipulates that the government grants tax benefits to certain renewable energy. However, the exemption from the payment of income taxes is only foreseen for foreign enterprises and enterprises with foreign investment. One project

²³ PDD China Yanzhou Hydropower Expanded Project

²⁴ PDD Shanshuping 12 MW Small Hydropower Project; PDD China Shaibeitan Hydropower Project

²⁵ PDD Henan Sanmenxia 25.5MW wind power project

²⁶ PDD Guohua Dongying Hekou 49.5 MW Wind Farm Project (Phase 1); PDD Hebei Shirensan Wind Power Project

²⁷ 国务院办公厅关于严格禁止违规建设 13.5 万千瓦及以下火电机组的通知

http://www.gov.cn/gongbao/content/2002/content_61480.htm

²⁸ PDD Guangan Shangshilong Hydro Project

calculated that in the case of such an exemption, it would be financially feasible²⁹. However, since such a policy does not apply for domestic renewable energy projects, the project developer would have considered getting further funding from CDM.

Additionality of projects hence is argued for with the government's focus on demonstration projects and a lack in planning security and financial viability under current prices. The question arises whether the contribution of the CDM to projects may inhibit structural reforms that could overcome price insecurity and the case-to-case financing of demonstration projects. Given the local expertise for the development of hydropower and wind energy projects, the NDRC seems to narrow down the CDM to its function as a provider of finances. This observation is further confirmed with the incorporation of the CDM in project application procedures.

6. Conclusion

how the interaction of the CDM institutional structures with existing ones determines CDM project assessment

Although China seems more than other countries to be benefiting from technology transfer (Ganapati and Liu 2008), this study cannot support these findings for wind energy and hydropower projects. For wind energy, national policies constrain technology transfer; for hydropower, local expertise seems to make technology transfer obsolete. Since the NDRC did not set specified sustainable development indicators against which projects can be checked, additionality becomes narrowed down to financial additionality. Ironically, the state gave, with its electricity sector reform in 2002, projects a good reason for their additionality. Grid prices since then have been considerably lowered as well as have become unstable. At the same time, the NDRC gave project developers good reasons to apply for CDM by stabilizing CER prices in the world market. Factors that limit project initiatives are, among others, low prices of CERs in comparison to the high costs of project formulation (Morera et al. 2003). With setting a minimum price, the NDRC guaranteed financial inflows from CDM.

From our analysis, we hence see that the NDRC has considerably narrowed down additionality to its economic dimension. However, seen in the light of its political commitment for renewable energies, a narrowed down additionality implies stronger institutions on which the CDM could build for creating synergies, - if it did not focus on being “additional”. The question hence arises whether, with its focus on additionality, the CDM is setting the wrong incentives.

With the affiliation of the CDM with the NDRC, the CDM can piggyback on its extensive organizational structure, which is supportive to information flows to local administrative levels. However, since the CDM is institutionalized within the procedures of project approval by local NDRCs, it is foremost used to fill financial gaps in project proposals. Its location with the NDRC narrows its scope considerably down. Affiliation with the NDRC however means that the latter can relate the CDM to the appropriate legal frameworks for implementation, a link that has been missing in other countries (Morera et al. 2003). Further, since the NDRC hosts the Climate Bureau, conflicts or competition with other institutions working on climate change, and who may consider themselves the national authority on the subject, do not take place neither (Morera et al. 2003).

²⁹ PDD Puding Hydro Power Project, p.10

For the NDRC, institutionalising the CDM means that local NDRCs have a wider range of funding possibilities to offer for local project developers. It seems that what have been nationally financed demonstration projects before, now become CDM funded projects. According to our analysis, local expertise (developed historically in the case of hydropower and due to institutional reforms in the case of wind power) is one main driver for CDM project advancement in China. We hence cannot support the observation of Ganapati and Liu (2008) that the distribution of CDM projects in China is the result of central control and processing of CDM application. It rather seems to us that the policy “walking on two legs”, which expresses the complementarity of the local and national level, is reproducing itself over the years.

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