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Delegation to Private Actors: A study of the Clean Development Mechanism

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Introduction

It is fashionable these days to speak of the rise of public-private partnerships; surprisingly, however, there is relatively little scholarly work on the interaction between states and private actors at the supranational level. This paper offers an in-depth case study of the Clean Development Mechanism (CDM)—one of the three market mechanisms of the Kyoto Protocol—which features a prominent role for non-state actors. Drawing from the principal-agent literature, this paper analyses the mechanics of this complex institutional arrangement, and its implications for accountability.

The Clean Development Mechanism (CDM) provides incentives for reducing greenhouse gas emissions by allowing Annex I (i.e. developed) countries to purchase emissions credits for abatement activities undertaken in developing countries and to apply these credits against their overall targets. Since all developed countries have committed to meeting specific reductions by the end of 2012, the CDM allows them to do so in theoretically the most cost-efficient manner—by purchasing emissions reductions where they are most cheaply produced, in the developing world.

The CDM offers a fertile case for global administrative law (GAL). It has prompted the creation of a number of subsidiary bodies, which have in turn been delegated authority to create and implement rules, resolve disputes, monitor and verify participants' behavior and award emissions reductions credits. Moreover, many of the delegatees, or agents, are non-state actors.[1] This paper will focus particularly on the implications for GAL of delegation to private actors.

Certainly, the CDM serves as an interesting empirical case of delegation to private actors. But there are also important legal and policy implications of this investigation. Although there is debate in the press and among policymakers about the "death" of the Kyoto Protocol, the CDM is very much alive and thriving. Thus far, the CDM has granted approximately 45 million credits or "certified emissions reductions" (CERs) through 238 projects.[2] Currently, there are approximately 1600 additional projects in the pipeline, estimated to represent some 1.9 billion CERs.[3] The CDM is growing almost exponentially; it follows then, that students of law and politics should be concerned with its functioning and the mechanisms in place to ensure the accountability of the agents involved. Indeed, the some of the implementation and accountability challenges faced by the CDM are equally applicable to other emissions trading schemes. As these become more widespread, these issues can only become more pertinent.

The goals of this paper are twofold. I seek a) to examine the types of costs and benefits of states' decision to delegate to private and public-private actors, and b) the associated accountability problems that stem from this type of delegation. I use the case of the CDM as a way to analyze these two issues, and ask: What can be learned about delegation to private actors using the case of the CDM? I argue that accountability mechanisms are particularly difficult in the case of

[1] The vast majority of agents in the CDM are private firms, but there are a few non-profit organizations as well.
[2] UNFCCC, "CERs Issued." Accessed at http://cdm.unfccc.int/Issuance/cers_iss.html.
[3] UNFCCC, "CDM Statistics." Accessed at http://cdm.unfccc.int/Statistics/index.html.

private actors, who may have different incentives and are likely more difficult to control than their public counterparts.

It is important to be clear from the outset about the limitations of this paper. It does *not* seek to explain why the Parties to the Kyoto Protocol create the Protocol itself, nor the specific reasons that motivated the Parties to delegate certain functions within the treaty. Rather, this paper seeks to describe systematically the key features of the CDM, not to explain why those features exist.

The paper is structured as follows. In the first section, I situate my research within the relevant literatures in law and political science and discuss links between them. Second, the paper defines delegation and the principal-agent framework used in the analysis. Third, it turns to an in-depth examination of the structure and functions of the CDM. Fourth, I discuss the accountability mechanisms in place in the CDM. The fifth section analyzes the types of costs and benefits that result from delegation, and discusses why private agents are especially likely to exacerbate the challenges of delegation.

I. Relevant literatures

In this section I outline how this investigation fits into current discussions in the political science and legal literatures. By focusing on the act of delegation, this paper aims to bring together debates in the GAL and delegation literatures, emphasizing their similarities and the potential contributions of each analytical frame to the other.

Derived from economics, delegation theory has only recently been used to explain the principal-agent relationship between states and international organizations.[4] Within the realm of international politics, there is little work extending it to private actors. Thus, this examination of the CDM presents an opportunity to use current theories of delegation on a new population to see how costs and benefits of delegation vary with this different set of actors. In turn, this case provides more opportunities for theory-building to expand the breadth and applicability of the delegation literature.

To date, studies of international politics offer similar explanations of delegation: States delegate to reduce transaction costs and solve problems that allow mutually beneficial cooperation. Specifically, "principals decide to delegate powers to an agent…because that agent will reduce the transaction costs of policy-making either by producing expert information for the principals or by allowing the principals to commit themselves credibly to their agreed course of action."[5] Recent work by Hawkins et. al. reiterates and expands upon this point: The authors explain five mechanisms through which delegation can confer benefits to agents by lowering the costs of cooperation. Delegation can help: reduce defection, facilitate collective decision-making; resolve disputes; enhance credibility through enforcement; and "lock in" certain practices.[6] A variant of the efficiency rationale is presented in the literature on public-private partnerships; it

[4] See, e.g Bradley and Kelley 2007; Hawkins et. al. 2006; Nielson and Tierney 2003; Pollack 2003; Alter 1998.
[5] Pollack 2003, 21
[6] Hawkins et. al. 2006, 13.

argues that delegation is motivated by governments' inability to address problems adequately.[7] Thus, although the body of literature is small, the dominant explanation for delegation to IOs appears to be different types of efficiency—lowering transaction costs, facilitating agreement, and creating credibility.

This paper also draws on and contributes to the literature on global administrative law (GAL). The emerging body of literature on GAL is derived, in part, from research on domestic administrative legal systems, which examines rules and mechanisms for controlling government agents.[8] The GAL literature asks a similar question on the international level: given the increasing amount of delegation to both public and private actors, how can international regimes ensure the accountability of these various actors? It aims to illustrate the problems of accountability in the new "global administrative space" and proposes ways to apply administrative principles to promote accountability of both state and private actors.[9]

GAL examines both a wide variety of actors—supranational, domestic, public, private and hybrid—as well as a diverse range of issues—from accounting standards to international organizations to forestry certification.[10] In this sense, it can be viewed as a means to address the "governance trilemma" described by Slaughter: interdependence has created a need for global rules without centralized power, but with ways to hold rule-makers accountable through different political mechanisms.[11]

By systematically describing in detail the structure and function of the CDM, this paper adds much needed data about what systems of governance can be considered part of GAL, and how they are currently implemented. Second, it describes the mechanisms used to control private agents, and the potential difficulties for principals in successfully carrying out this task.

Discussion both in the delegation and GAL literatures begins from the premise that "complex interdependence"—the ways that states are linked and therefore mutually dependent on each other—is prompting changes in the ways states address problems.[12] Kingsbury et. al. note that the growth in transnational regulation has contributed to the rise in GAL, since "important regulatory functions are no longer exclusively domestic in character."[13] Applying the lens of political science suggests that many of these regulatory functions are instances of delegation, where a variety of actors undertake administrative activities. GAL comprises delegation both at the national level—where domestic agents come together in transnational networks[14] and at the supranational level, where states delegate specific tasks to IOs, hybrid intergovernmental arrangements, or private institutions.[15]

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[7] Streck 2004.
[8] See, e.g. Stewart 1975
[9] Kingsbury et. al. 2005
[10] On accounting see Mattli and Buthe 2005; on IOs, see e.g. Fox and Brown 1998; on forestry see Cashore et. al. 2004.
[11] Slaughter 2004, 8-9.
[12] Keohane and Nye 1977, 8.
[13] Kingsbury et. al. 2005, 25.
[14] Slaughter 2004.
[15] See Kingsbury et. al. 2005 on the five types of global administration, 20-23.

Both perspectives have weaknesses. The GAL literature focuses largely on how delegation affects accountability mechanisms, but it does not look closely at the temporally prior issue of the costs and benefits of the act of delegation. To address this gap, I begin from the premise that we must understand the mechanics of delegation—including the costs, benefits and politics involved—before delving into its consequences. Moreover, this analysis calls attention to the interrelation between politics and GAL mechanisms; sometimes the disjuncture between GAL procedures and practices can undercut efforts to hold global actors accountable.

The literature examining delegation to supranational actors also has shortcomings. First, unlike GAL, it has focused almost exclusively on delegation to public actors – either agents of the state at the domestic level or international organizations (and even this is a relatively new development). In the international relations, the literature has largely sidestepped the issue of private actors. Indeed, some have argued that there is little work on agents of either type, despite the vast principal-agent literature.[16] As a result, delegation theory in international relations takes agents to be relatively unitary; thus control mechanisms will operate similarly on similar types of agents. Second, the work on delegation assumes that holding agents accountable is largely a matter of a cost/ benefit calculations. That is, if states are willing to devote the resources necessary to monitoring and constraining agents, then the proper control mechanisms can be designed and implemented.[17] As I will argue in Section IV, this last assumption becomes particularly problematic when private actors are the agents.

II. Defining delegation

In this section, I define delegation and explain how it is operationalized in this study. I then turn to the aspects of the principal-agent relationship that are particular to private agents.

Following Moe, delegation is present in situations in which "the principal considers entering into a contractual agreement with another, the agent, in the expectation that the agent will subsequently choose actions that produce outcomes desired by the principal."[18] In applying delegation theory to IOs, Hawkins et. al. define delegation as "a conditional grant of authority from a principal to an agent that empowers the latter to act on behalf of the former."[19] Their definition emphasizes the importance of revocability; states can always decide that the agent's performance is inadequate, and reverse the decision to delegate.

In this study, I use treaties and decisions of subsidiary bodies as evidence of delegation. Thus, the initial act of delegation by states was the creation of the CDM in Article 12 of the Kyoto Protocol. The scope of the authority delegated was further refined in the Marrakesh Accords, which, among other things, details the modalities of the CDM.[20] Since then, a number of subsequent decisions by the Executive Board of the CDM have further delegated authority to

[16] Hawkins and Jacoby 2006.
[17] Kiewit and McCubbins 1991.
[18] Moe 1984, 756.
[19] Hawkins 2006: 7.
[20] UNFCCC 2002.

various Panels and ad-hoc bodies that are responsible for various acts of rulemaking and implementation. These will be discussed further in the following section. For now, the important fact is that these acts of delegation have been explicit and are carefully documented in the decisions of the Meeting of the Parties to the Kyoto Protocol.

There are two additional characteristics of delegation that are relevant to this study. First, delegation can be either direct or indirect. In a situation of direct delegation, a state delegates to an IO or private actor to carry out a specific task; the agent then implements according to its mandate. In indirect delegation, or what Bradley and Kelley refer to as "re-delegation", the agent then delegates to a third party who carries the required tasks.[21] We can think of the many instances when states delegate to IOs, who in turn contract with NGOs to implement programs as an instance of re-delegation. The state thus delegates to the NGO indirectly, as mediated by the IO.

Second, traditional theories of delegation generally present three distinct models of the principal. In the first, a single principal delegates to a single agent; this is often the model we seen when domestic governments delegate to implementing agencies. In the second, multiple distinct principals delegate to a single agent. In the third—the one most relevant for this study—a collective principal delegates to a single agent. In this third mode, the principals jointly agree upon and design the arrangement which governs the agent. The model of the collective principal includes most IOs, and supranational arrangements such as the European Union. The case of the CDM is a clear example of a collective principal–where the principal is the Parties to the Kyoto Protocol.

III. Structure and function of the CDM

This section offers a description of how the process of approving, implementing and monitoring of CDM projects works, and of the structure of the CDM and its various component parts. As will become evident, the structure of the CDM is complex; the author asks for the readers' patience in this description. This lengthy detour is necessary to understand the tasks and degree of authority that has been delegate to private and public-private actors. Moreover, the author is not aware of any other in depth examinations of the structure of the CDM.[22]

A. An overview of the CDM project cycle

The CDM is a market-based mechanism, which allows developed, or Annex I (AI) countries to receive credits, or "certified emissions reductions" (CERs) for projects that they finance in Non-Annex I countries. It therefore allows AI countries some flexibility in the manner in which they choose to meet their emissions reductions targets. The logic of the CDM is that the marginal cost of emissions reductions will be lower in the developing world, thus achieving global reductions in the most cost-efficient manner.

[21] Bradley and Kelley 2007, 17.

[22] The only other analysis of the CDM which focuses on its hybrid form is Streck 2004. However, her discussion mainly focuses on the Designated Operational Entities, without any treatment of the CDM's other panels.

The CDM is an ambitious attempt to create a new currency, the CER, which can be bought and sold on the open market.[23] Although originally conceived as a way for AI countries to meet their reductions requirements, the use of credits generated by the CDM is not limited to states. Indeed, a number of private actors are participating directly in the market for CERs—either because they have reductions that they have not met, or because they wish to exceed their allotted emissions allocations.[24]

Each project that wishes to participate in the CDM must undergo a rigorous application process.[25] The applicant must first submit a Project Design Document (PDD) to the Executive Board (EB), which serves as the governing body of the CDM. The PDD requires detailed information about the project activities, estimated emissions reductions, plans for monitoring, and perhaps most importantly, information about baselines and leakage.[26] Estimating the emissions reductions requires employing a counterfactual, or baseline: how much carbon dioxide (or its equivalent) would be generated in the absence of this project? The CDM has created a number of complex methodologies—and a number of subsidiary bodies—to establish and advise about these baselines and their implementation. Each proposed project must use one of these extant methodologies (or successfully petition for the inclusion of a new one) against which to measure its activities. The PDD also requires that the project design avoid the problem of "leakage", so that the CO_2 producing activities are not simply shifted to another area beyond the project boundaries. Finally, the PDD must demonstrate that stakeholders were consulted in the planning process and that project planners took "due account" of their comments.[27]

Once this document is prepared, it must be validated by an accredited Designated Operational Entity (DOE) of the CDM.[28] The DOE makes a recommendation to the EB about whether the project should go forward, based on criteria set forth in the methodologies for various project types, and those outlined in Article 12 of the Protocol. If it approves the PDD, the project is validated and registered by the EB. A different DOE is then responsible for monitoring the project, verifying the specified activities and finally, certifying that the reductions have actually taken place. Certification by the DOE constitutes a formal request to the EB that the CERs be issued to the project funder.

Project participants must pay fees to participate in the CDM. Two percent of the CERs generated by the project are appropriated to the Adaptation Fund.[29] The investing Party must also pay a fee to cover the costs incurred by the Secretariat for administering the project. Once these have been paid, the CERs are transferred to the investing Party into the CDM Registry.

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[23] Victor and House 2004.
[24] Wara 2006, 12; Wilkins 2002, 147.
[25] For a succinct description of the project cycle, see Wilkins 2002.
[26] Complete documentation about rules of procedure and modalities can be found in UNFCCC 2001 Provisions for the contents of the PDD can be found in UNFCCC 2001, Annex B.
[27] Stakeholders are defined in UNFCCC 2001, paragraph 1(e) Annex as "the public, including individuals, groups or communities affected, or likely to be affected, by the proposed clean development mechanism project activity." The most recent version of the PDD can be found at http://cdm.unfccc.int/Reference/Documents/cdmpdd/English/CDM_PDD.pdf.
[28] The validation process is outlined in UNFCCC 2002, Annex paras. 35-42.
[29] 169 project participants involved in CDM activities in least developed countries are exempt from paying this levy.

The Registry is administered by the Secretariat and is the official repository for credits generated through the CDM.[30] These can then be traded or used against total emissions reduction requirements.

B. The Executive Board

The EB is the main governing body of the CDM. It reports to the Meeting of the Parties (MOP) which is the ultimate decision-maker in the Kyoto Protocol. The MOP then adopts amends or rejects the decisions recommended by the EB.[31] The EB is comprised of ten representatives of Parties to the Protocol—five members and five alternates—who may serve for a total of four consecutive years.[32] There is one representative from each of the five UN regions, two additional representatives from both AI and Non-Annex I (NAI) nations, and one representative from Small Island Developing states. EB members must sign a written oath declaring that they have no financial interests at stake in the CDM, and are obligated not to disclose confidential or proprietary information both during and after her tenure as Board member. The Board generally works by consensus, but in the case of disagreement, can take decisions with a three-fourths majority.

In order to carry out its responsibilities to review and approve projects, the EB is given broad latitude to establish committees, panels or working groups to assist the EB in carrying out its duties:

> The executive board may establish committees, panels or working groups to assist it in the performance of its functions. The executive board shall draw on the expertise necessary to perform its functions, including from the UNFCCC roster of experts.[33]

This seemingly innocuous rule of procedure has given rise to a sizable set of supporting bodies, including the aforementioned designated operational entities, as well as an Accreditation Panel, an ad-hoc accreditation team, and panels focusing on methodologies, afforestation and reforestation, small scale projects and registry and issuance.[34]

In addition to creating and overseeing these various panels, the EB also has powers to review pending projects, or to mandate that alterations to the project design be made. Review is undertaken by two Board members and "outside experts, as appropriate" who are appointed by the Board. The EB can also review projects after they completed, but before CERs have been issued; such a request must be made by at least three members of the Board. To help evaluate the recommendations made by the DOEs, the EB has created a Registry and Issuance Team,

[30] The Subsidiary Body for Implementation (SBI) is in the process of finalizing an International transaction log, which will perform checks to verify transactions of carbon credits under the Kyoto Protocol. The beta version is now functional, and it is anticipated that it will be formally introduced by the end of 2007. The technology is currently being discussed in the SBI meeting in May 2007; additional information is available in FCCC/SBI/2007/INF.3. Accessed at http://unfccc.int/resource/docs/2007/sbi/eng/inf03.pdf.

[31] Although the Executive Board sometimes overrules the recommendations of the DOEs, there is no data available on whether or how often the MOP overrules the recommendations of the EB.

[32] This section draws heavily on the Rules of Procedure for the Executive Board, which is found in UNFCCC 2005, Decision 4/CMP.1, Annex I.

[33] UNFCCC 2002, Annex, para 18.

[34] Further guidance for the EB on Panels and Working Groups is found in Executive Board 2005, Annex I.

which was "established to assist Board members in their task to consider requests for registration of project activities and requests for issuance of CERs submitted to the Board by DOEs."[35]

C. The Designated Operational Entities

The Designated Operational Entities (DOEs) are at the crux of the design and implementation of the CDM. They are private actors that serve two functions: 1) to validate the proposed projects and then, 2) to verify and certify project activities. (I refer to these two separate activities as "validate" and "verify.") Most DOEs are private companies, often large risk management firms, which specialize in functions such as standardization, certification, verification, inspection and testing (see Table 1). A small number are non-profit organizations. DOEs must apply for accreditation to the EB, a process that will be outlined in the following section. As of 12 May 2007, there were 17 accredited DOEs. CDM projects are divided into 15 "sectoral scopes"—ranging from activities such as energy distribution to agriculture to waste handling—within which there are a number of approved methodologies for conducting the projects. DOEs are only permitted to validate or verify projects within those sectoral scopes for which they are accredited. For example, a DOE accredited to evaluate transport projects is not permitted to evaluate afforestation and reforestation projects, unless it applies for and receives accreditation to do so.

To prevent conflict of interests, the validation and verification functions are (in principle) to be carried out by different DOEs. The logic of this separation of tasks is that a DOE, which is compensated by the project applicant for its services, may have an incentive to ensure the successful completion of the project—either to secure compensation or to earn the trust of a repeat customer. Thus, the separation of validation and verification is one way to try to avoid this capture. However, we will see that this is not always the case.

Table 1 shows a brief description of each of the accredited DOEs, including the scopes for which they are accredited for validation and verification. Table 2 shows the same information by organized by scope, rather than by DOE. As is clear from Table 2, only five of the sixteen DOEs are accredited to validate in more than four scopes. Only six of the seventeen are accredited to verify in more than four scopes. Indeed, more than half of the accredited DOEs are unable to verify in any scope. Put simply, although seventeen appears to be a small number, when looking at the DOEs accredited in specific scopes, the number shrinks even further. There are only six DOEs permitted to do *any* verification at all. This means that all of the decisions about which projects may proceed under the CDM are controlled by only six DOEs.[36]

Table 2 also shows the considerable overlap between those DOEs accredited to validate and verify. This is not surprising given that the majority of the DOEs are specialized in only one or two sectoral scopes. However, there are at least two sectoral scopes—mining/mineral production and metal production—in which there is only one DOE that is accredited, and hence must undertake both validation and verification. Thus, although in principle, these two activities must

[35] UNFCCC Executive Board 2006, Annex 43, para 1.

[36] Of course, as stated earlier, recommended action of the DOE is subject to the review and approval of the EB, but the EB rarely overrules the recommendations of the DOE (I'm checking to see when and if such overruling has occurred).

be undertaken by separate DOEs, in some cases this is not possible. Hence, the EB has a little-publicized provision that permits this practice.[37]

D. Accrediting the DOEs: The CDM-AP and the CDM-AT

Since the activities of the DOEs hinge on their accreditation, it is worth a brief review of how that process works, and which actors are involved in deciding whether or not a DOE applying for accreditation is approved.[38] There are two panels that work under the EB in the accreditation of the DOE: the CDM Accreditation Panel (CDM-AP) and the CDM Assessment Team (CDM-AT). Before any evaluation begins, applicants wishing to become an accredited DOE must fill out the application and pay a non-refundable US$15,000 fee (applicants from Non-Annex I countries only have to pay half of the fee up front). The applicant is also responsible for covering the costs incurred by the Accreditation Panel and Assessment Team during the application process.

The Accreditation Panel is responsible for preparing the recommendation to the EB regarding the accreditation of the applicant. This recommendation is based on an in-depth evaluation undertaken by the Assessment Team, which involves a desktop review of the application; on-site assessment that verifies that the applicant is capable of carrying out tasks required by a DOE in a given sectoral scope; and witnessing of the performance of those tasks by the applicant.[39] Based on this evaluation, the Assessment team prepares a document that details how the applicant performed, and makes its recommendation for consideration by the CDM-AP. Based on the input of the Assessment Team, the CDM-AP decides whether or not to recommend accreditation of the applicant to the EB. The CDM-AP must inform the applicant of its decision; the applicant then has six days to appeal the decision or withdraw its application if it so chooses. If the applicant asks for an appeal, a new process is triggered, and an appeals panel assembled.[40] If there is no appeal, the CDM-AP makes its recommendation to the EB; final approval rests with the COP/MOP. Figure 1 illustrates this process graphically.

Figure 1: Accreditation procedure for DOEs

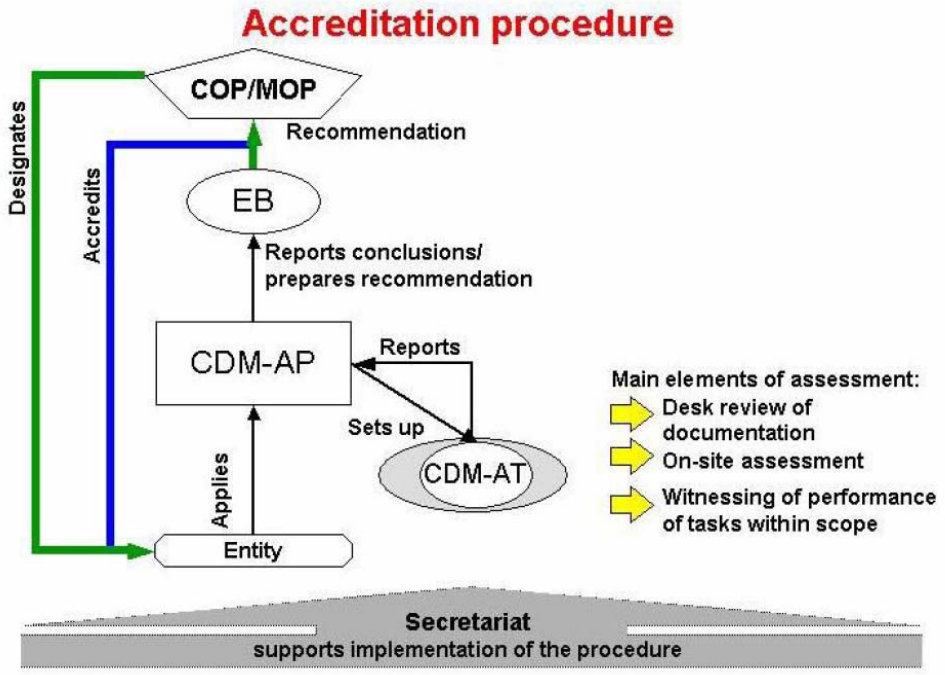
[37] See http://cdm.unfccc.int/DOE/grapgaccrproc.html, footnote 1.

[38] See UNFCCC Executive Board 2007, Annex I. This is an extremely involved process, and the following only characterizes the main steps. It is sufficiently complicated that the Executive Board created a handbook for potential applicants, available at http://cdm.unfccc.int/Reference/Guidclarif/accr_handbook.pdf.

[39] The CDM-AP decides who will serve on the CDM-AT, but the Secretariat provides suggestions. Each CDM-AT must have at least three members, including the team leader. Depending on the size of the applicant firm, or the number of scopes the applicant is seeking accreditation for, the CDM-AT may be larger.

[40] See UNFCCC Executive Board 2007, Annex I.

Figure 1



Source: UNFCCC EB-26 Meeting Report, Annex I.

The CDM-AP and the CDM-ATs are composed of members of the Executive Board, as well as private actors who apply to be considered as possible members of each body. Provided that they meet the qualifications set forth in the respect terms of reference, they are added to a "Roster of Experts". The Executive Board then selects individuals from the Roster to carry out specific assessment activities.[41] The only stated selection criteria (beyond meeting the basic competency requirements) is ensuring a regional balance in the composition of the body. They do *not* have to be nominated by their governments. It is worth noting here that the CDM-AP in particular has expressed concern about the lack of experts available to undertake the necessary assessments, and has suggested contracting with a set of experts on a longer term basis. The EB is now considering this proposal.[42]

E. Other Panels

There are a number of other ad-hoc panels and working groups that support the EB. These include the methodology panel, the afforestation and reforestation working group, and the small-scale working group. These groups function in a similar fashion. Individuals meeting the competency requirements can apply to serve on the "Roster of Experts." The EB then selects members from the Roster for specific projects or tasks. Most provide advice on monitoring and measuring methodologies for different types of carbon abatement projects.

[41] UNFCCC Executive Board 2006, Annex I.
[42] UNFCCC Executive Board 2006b, para 7.

Among these Panels, the Registry and Issuance Team is of particular interest. It was created to aid the EB in its evaluation of DOE recommendations and specifically "to assist Board members in their task to consider requests for registration of project activities and requests for issuance of CERs submitted to the Board by DOEs."[43] The Team is comprised of 20 members, selected from a public call for experts, who may be called upon by members of the EB to provide an appraisal of whether and how a DOE has met its requirements. Thus, to the extent that the EB is not able to make decisions about who should receive emissions reductions credits for their activities, it enlists the input of the Registry and Issuance team to make recommendations about this decision.

IV. Accountability Mechanisms

To help make sense of this complex institutional landscape, this section outlines some of the main mechanisms for accountability in the CDM. I group them into three broad categories: public participation, accountability mechanisms and rights of review.[44]

A. Public participation

As Cassese notes, participation rights—both on the domestic and global levels—are important because "Process control or voice encourage people's cooperation with authorities and lead to legitimacy."[45] There are a number of provisions in the CDM that allow for public participation, or encourage it through transparency. First, all of the documentation, including meeting notes, is available on the website. Although meetings are not open to the public, interested groups can see webcasts of the meetings via the UNFCCC website. When Executive Board meetings overlap with other meetings of the UNFCCC, often EB members meet with non-state actors.

The transparency of the meetings has allowed for considerable scrutiny by NGOs. Large international environmental NGOs as well as smaller more focused groups such as CDMWatch and SinksWatch constantly monitor the discussions and decisions made by the EB. They often comment publicly or directly to the EB on current developments. Indeed, the wealth of information about CDM projects allowed one researcher to conclude that "accounting tricks that allow participants to manufacture CERs at little or no cost."[46] The author further argues that the CDM has been successful as a political mechanism, but a failure as a producer of emissions reductions. The recognition that the CDM allows the production of these "empty credits" has prompted the EB to respond to the problem. It

> "*[r]ecognizes* that issuing certified emission reductions for hydrofluorocarbon- 23 (HFC-23) destruction at new HCFC-22 facilities could lead to higher global production of HCFC-22 and/or HFC-23 than would otherwise occur and that the clean development mechanism should not lead to such increases.[47]

[43] UNFCCC Executive Board 2007, Annex 14, para 1.
[44] For two varying conceptions of different accountability mechanisms see Grant and Keohane 2005 and Stewart 2006.
[45] Cassese 2006.
[46] Wara 2006, 8.
[47] UNFCCC CDM Executive Board 2005.

This is one example of the successful use of transparency to prompt careful scrutiny of the CDM's activities, and responsiveness by the institution in the face of criticism.

Public participation is further encouraged through notice and comment periods. All methodologies under consideration are posted to the website for a comment period. Similarly, the Project Design Document must be made available to the public for a 30-day period; project participants are required to show that they have duly considered any feedback received through this comment period.[48] Finally, participants in CDM projects, NGOs accredited with the UNFCCC or stakeholders affected by CDM projects may also participate through registering complaints with the EB about DOEs activities. Written complaints from any of these actors may trigger an "unscheduled surveillance" or "spot check" of an accredited DOE.[49]

B. Accountability

There are two main types of accountability mechanisms present in the CDM structure: supervisory and legal. I discuss each in turn. By supervisory accountability, I refer to those situations where "one organization acts as principal with respect to specified agents."[50] In this case, the EB serves as the principal, and the DOEs are the agents. The accreditation process for the DOEs is perhaps the most carefully monitored component of the CDM. This is logical, since the DOEs these are at the core of a functioning market for CERs, and careful screening can help mitigate situations of wide preference divergence between agent and principal.[51] As discussed in the previous section, the accreditation process includes a long chain of actors, each responsible for reviewing and evaluating the work of the previous one. Thus, the Assessment Team reports to the Assessment Panel, which in turn makes a recommendation to the EB.

The EB considers the Assessment Panel's report. If it has any doubts or difficulties, it enlists help of the Registration and Issuance Team to ensure that the DOEs have acted according to protocol and made appropriate decisions with respect to certifying CERs. The final EB recommendation is sent to the Meeting of the Parties of the Kyoto Protocol, which takes the final decision with respect to accreditation and issuance of CERs. If the EB has any doubts about the accreditation or subsequent activities of any of the DOEs, it may conduct a "spot check" of the DOE, to ensure that it is in compliance with the Kyoto Protocol and the various procedures of the CDM.[52] If the EB finds that the DOE is *not* in compliance, it has the right to revoke accreditation immediately. The DOE is responsible for bearing the costs of a spot check, irrespective of its outcome.

In addition to oversight by the EB and the Registration and Issuance Team, the separation of validation from verification activities is intended to reduce the incentive for DOEs to approve projects solely to ensure that they receive payment. As discussed in the previous section, this provision does not always apply, given the small number of DOEs accredited in certain sectoral scopes.

[48] UNFCCC CDM Executive Board 2006a.
[49] UNFCCC CDM Executive Board 2003, 11.
[50] Grant and Keohane 2005, 36.
[51] Nielson and Tierney 2003.
[52] UNFCCC CDM Executive Board 2003, 10.

Provisions for legal accountability of private actors involved in the CDM are less well-developed. Legal accountability can be understood as: "a participatory element in any legal system that allows citizens to sue powerful entities for failures of responsibility."[53] The CDM currently relies on domestic legal systems for this type of accountability. DOEs, for example, are expected to have insurance coverage as well as "sufficient arrangements to cover legal and financial liabilities arising from its activities."[54] There are no further specifications about legal consequences of failure to comply with CDM procedure. The most serious penalty is revocation of accreditation. Moreover, there is an unresolved issue about the legal status of those involved in the CDM's various panels and working groups. These experts are understandably concerned about their potential liability in decisions taken based on their advice. Currently, these actors are not protected from legal action, though there is an ongoing attempt to remedy this problem.[55] As Cafaggi points out, without enforceable liability rules, regulators may not have proper incentives to do their job or to do it well.[56] He further argues that transfer of regulatory power to private actors can only increase efficiency when designed properly, and that such a design must include enforceable liability rules. Thus far, these rules are not in place in the CDM.

C. Rights of Review

The governance of the CDM provides two separate opportunities for review and challenge of DOE and EB recommendations. In the beginning of the project cycle, during validation, project participants can request a review of the DOE's recommendation to the EB. In this case, the EB assembles a review team, which includes both EB members and outside experts as appropriate. The review team makes a recommendation to the EB, which then takes a final decision: to register the proposed project, to require changes to the proposed project or to reject it outright. The decision of the EB is final, though it is required to make public the reasons for its decision.

At the end of the project cycle, participants can also request a review before the final issuance of the CERs. This is largely to prevent against "fraud, malfeasance or incompetence of the designated operational entities."[57] In this situation, either a party involved in the project or three members of the EB can request a review after the CERs are certified but before they are formally issued.[58] The EB undertakes the review, and has thirty days to take a decision: to approve the issuance, to request further action by the DOE or to reject the issuance of CERs. In some situations, such as when the DOE is found to have conducted itself fraudulently, it may be asked to reimburse the EB for the cost of the review. Again, the decision of the EB is final and is not subject to appeal.

V. **The costs and benefits of delegation**

[53] Grant and Keohane 2005, 36.
[54] UNFCCC 2006, Appendix A, 21.
[55] At its last meeting in May 2006, the Subsidiary Body for Implementation discussed how to address problem of "privileges and immunities" of those serving on expert review teams. See Earth Negotiations Bulletin, Vol. 12, No. 306 and FCCC/SBI/2006/L.10.
[56] Cafaggi 2006, pp. 44-56.
[57] FCCC/KP/CMP/2005/8/Add.1, Annex IV, para 2. FCCC/KP/CMP/2005/8/Add.1, Annex III.
[58] EB rules of procedure, para 65. See also "Procedures for Review" in EB rules of procedure -- FCCC/KP/CMP/2005/8/Add.1, Annex III. These were further clarified in UNFCCC EB 2007, Annex 16.

In this section, I discuss the types of costs and benefits that delegation can create, as demonstrated by the CDM. I argue that although delegation has facilitated agreement and the relatively quick implementation of the CDM, the costs of delegation may be cause for concern—particularly when agents are private actors. After discussing the types of benefits and costs, I turn to the specific challenges of delegation to private actors.

A. Benefits.

As mentioned earlier, the political science literature on delegation at the supranational level suggests that the main logic for delegation is efficiency. Efficiency, however, can be interpreted in a number of different ways. First, it can promote a faster decisionmaking process. As Pollack notes, one of the benefits of delegation in the EU is that it prevents endless "cycling" of the agenda. That is, agents can limit the scope of policy debates so that the same issues are not continually re-introduced for political purposes.[59] Second, by using existing expertise rather creating it anew, it can reduce transaction costs. Third, by delegating key tasks of monitoring to a (more) neutral third party, it can reassure those involved that commitments are credible. Fourth, particularly in the case of private actors, delegation can create incentives for learning.

Speed. Delegation helped increase the pace of decisionmaking and implementation in the CDM by facilitating the initial agreement and later, by using existing expertise. Given the difficulty of reaching an agreement at Kyoto, including several tense moments of near collapse, the less precise obligations involving private actors were a way to reach a bargain. Rather than additional hard negotiating about the details of how the CDM would be managed, diplomats were able to create the CDM and simply delegate future decisions to the future members of the Executive Board.

Reduced transaction costs. Second, using outside experts in a highly technical issue area helps quicken the pace of institutional creation. Those participating in the CDM, both from governments and the private sector, are experts in the issues surrounding the measurement of GHG emissions. Delegation was equivalent to the decision to "buy" expertise from private firms, rather than taking the time to "make" it, within existing international organizations. This allowed the Executive Board to focus on making rules to govern the CDM process, rather than worrying about who would be responsible for implementation. However, as noted in section IV, this may create undue dependence on a very small group of actors. As one member of the Secretariat noted, the total number of experts accredited to participate in the CDM-AP and the CDM-AT is around forty—and falling.[60] The growth of the CDM in the long-term *may* generate demand for more experts, but this is unclear.

Choosing to "buy" instead of make expertise also reduces transaction costs, which can loosely be considered "the costs of doing business." However, the project-based approach of the CDM, as well as the intensive procedures for controlling and monitoring agents has resulted in another set of transaction costs, which critics argues are quite formidable, and growing.[61]

[59] Pollack 2003.
[60] Personal Communication, Bilal Anwar, 21 November 2006.
[61] Personal Communication, Michael Oppenheimer 10 November 2006.

Credible Commitments. The North-South schism during the negotiation of the Protocol demonstrates that levels of trust between the two groups were low.[62] Non-Annex I countries were dubious that the developed world would actually make any meaningful changes domestically. Annex I countries wanted to ensure that any monetary benefits to the developing world were for "real, measurable and long-term benefits related to the mitigation of climate change", and not mere accounting tricks.[63] A commitment to third-party monitoring served as a signal, especially from the North to the South, that states were willing to be held to their obligations, at least with respect to the CDM.

As Victor and House note, the CDM is creating a new currency—substituting emissions reductions for dollars.[64] Any functioning market must be stable, and investors must be reassured that investments are relatively low risks. Although the CDM has yet to become a full-fledged, freestanding market, but the same tenets apply. Without accurate measurement and verifications of proposed reductions, prices will not reflect the value of the credits. Moreover, delegating to private actors helps reduce cheating and ensures investors of the viability of the market.

Incentives for learning and the need for expertise. Although the preferences of private agents present challenges to accountability, as will be discussed in the following section, the incentive structure of the CDM tries to use these preferences to promote learning within the institution and expansion of its scope. In the CDM, DOEs and aspiring DOEs have an incentive to learn how to measure and monitor emissions reductions and to develop new methodologies. Learning to measure emissions and monitor CDM projects provides a new stream of revenue for firms that wish to expand their operations. Developing new methodologies allows DOEs to "corner the market"—at least at the outset—of that particular type of projects. In general, the importance of reputation in the market creates an incentive for DOEs to deliver a reliable and high quality product, both to protect their accreditation status and to ensure repeat business. Moreover, if private carbon markets continue to expand and link together, the incentives for private agents to learn and perform well become even more pronounced. Public agents may not experience these incentives as strongly.

B. Costs of delegation

Of course, delegation is not without costs. There are two fundamental costs of delegation: sovereignty costs, and the risk of agency slack or slippage. I discuss each of these in turn, as well as the conditions in the CDM that contribute to the problems of slack and slippage. Finally, I turn to an analysis of why private agents are especially likely to exacerbate the challenges of delegation.

Sovereignty Costs. Broadly conceived, sovereignty costs include any activity that compromises the autonomy of the state. One recent working paper by Bradley and Kelley suggests that delegation can be evaluated according to sovereignty costs incurred.[65] They argue that different

[62] Bodansky 1993.
[63] Article 12.5(a).
[64] Victor and House 2004.
[65] Bradley and Kelley 2007.

delegated functions have levels of sovereignty costs, and offer a framework for evaluating these costs. The important point here, however, is that although there may be variation across functions or issue areas, all delegation incurs costs. As Abbott et al. note in their classic work on legalization, "actors with delegated legal authority have their own interests, the pursuit of which may be more or less successfully constrained by conditions on the grant of authority and concomitant surveillance by member states."[66]

Potential for Slack and Slippage.
The fundamental challenge of delegation is controlling the agent.[67] The principal-agent literature warns that agents are likely to "shirk" their delegated tasks, or that there may be slippage between the preferences of the principal and the agent. Shirking occurs when individual agents reduce the effort or resources they expend in performing a delegated task and free-ride on the efforts of others. Slippage refers to the fact that "because the interests of principal and agent are never completely coincident, there will always be agency slippage between what the principal wants and what the agent does."[68]

There are two features of the CDM in particular that contribute to the risks of agency slack and slippage.

Challenges of re-delegation. Recall that re-delegation occurs when a principal delegates to an agent, who in turn delegates to another agent. Re-delegation is used extensively in the CDM. Parties to the Kyoto Protocol delegated the carrying out the tasks of the CDM to the Executive Board, which in turn has delegated a variety of these tasks to the various bodies described in section IV. As the chain of delegation lengthens through re-delegation, so does agency slack and slippage. Thus, with each link in the chain, the ultimate principals must take even greater care to monitor agents, and the agents below them.

The problem of information asymmetry
There are extremely few DOEs involved in the validation and verification processes. This makes these activities subject to monopoly. DOEs are able to set prices for their services. Moreover, there is an incentive for DOEs to collude with each other to ensure that projects "go through", earning all of the proposed level of CERs.[69] The logic of separating validation and verification functions is to provide checks and balances among agents to prevent against such collusion, though it does not change the incentive to do so. Clearly, in cases where only one firm is accredited to validate and verify, there may not even be a need for collusion. Finally, the lack of expertise on the EB to evaluate information put before it by the DOEs exacerbates these problems. The solution—which has come in the form of the Registration and Issuance team—adds another layer of principal-agent problems due to re-delegation. It is unclear if or how the RIT, which is essentially in charge of "watching the watchers" successfully addresses the problem of information asymmetry.

[66] Abbott et. al. 2000, 418.
[67] Alchian and Demsetz 1972.
[68] Nielson and Tierney 2003, 246.
[69] Though note that the DOEs are required to demonstrate that they have no conflict of interest, and submit annual reports to the EB about their activities (EB rules of procedure paras 27(d) and (g).)

The nature of the private agent

Are the costs of delegation outlined above increased by the choice to use private agents? This section outlines three fundamental ways in which private agents differ from public ones, and the implications for the benefits of delegation and accountability mechanisms.

First, private firms are motivated, at least in some measure, by profit. The firms responsible for monitoring and verifying the emissions reductions projects (the designated operational entities) therefore have an incentive to push projects through; approved projects help boost their reputation, their client base, and their profits. In the parlance of the principal-agent literature, then, private actors are more prone to "slippage"—divergence between the principal's preference and the agent's action.

Second, because of these separate streams of revenue, private agents can be considered more autonomous than public ones. Whereas public agents are generally subject to the budgetary controls exercised by principals, the same logic does not apply to private agents.[70] As Lindseth notes, "In fact, private actors almost certainly enjoy even greater regulatory autonomy than their public-administrative counterparts because, by operating outside the confines of the state, the costs and difficulties of monitoring and supervision become that much greater."[71]

Third, principal-agent relationships between a public principal and a private agent are voluntary. When states delegate to public actors, the relationship is "involuntary", in the sense that state agencies (on the domestic level) or international organizations (on the international level) are not in a position to refuse any task delegated to them. This logic does not hold for private actors, who can simply refuse to enter into any arrangement that they do not find beneficial.[72] In this sense, the private actor is only voluntarily an agent of the state—at least, until it enters into a contract.

These three fundamental differences between public and private actors suggest that principals should be particularly concerned when contracting with private agents, and may need to adjust accountability mechanisms accordingly.

VI. Conclusion

This paper has sought to describe, in detail, the workings of the Clean Development Mechanisms of the Kyoto Protocol, and the role of private actors therein. It has drawn on both legal and political science literatures to describe costs and benefits of delegation, and the nature of the accountability challenges it presents. In particular, it has argued that the CDM is an example of how delegation to private agents presents unique challenges to accountability.

[70] Grant and Keohane 2007 discuss how different types apply to different actors.
[71] Lindseth 2007, 26.
[72] Moe 1990, 233. The notion that delegation is *completely* free of coercion may be an ideal type, though likely to hold in most developed states.

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Table 1: Basic information about accredited DOEs[i]

Entity Name (short name)	Principal activities	Location of HQ	2005 profits (as reported in financial statements of the Annual Report)[ii]	Sectoral scopes for validation	Sectoral scopes for verification and certification	URL
Japan Quality Assurance Organization (JQA)	"not-for-profit organization specializing in registration services for ISO management systems as well as safety testing and certification for compliance to a variety of standards, both national and international"	Tokyo, Japan	US$143M[iii]	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13		http://www.jqa.jp/00english/english_main1.html
JACO CDM.,LTD (JACO)	Formerly a division of JACO; the organization focuses solely on validation and verification of CDM projects	Tokyo, Japan	Not available	1, 2, 3		http://www.jaco-cdm.com/
Det Norske Veritas Certification Ltd. (DNVcert)	"global provider of services for managing risk". Provides certification of ISO standards, corporate accountability practice, and a variety of climate change activities including CDM projects	Oslo, Norway	US$61M	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15	http://www.dnvcert.com/DNV/ClimateChange/
TÜV SÜD Industrie Service GmbH (TÜV-SÜD)	A "technical service company" that provides services including inspections, certification and training.	Munich, Germany	US$89.1M	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 15	http://www.tuev-sued.de/en
Tohmatsu Evaluation and Certification Organization Co., Ltd. (TECO)	Provides ISO certification, CDM verification and validation, environmental rating. Appears to be a subsidiary of Deloitte.	Tokyo, Japan	Not available	1, 2, 3		http://www.teco.tohmatsu.co.jp/service/is022e.html
Japan Consulting Institute (JCI)	JCI-CDM, the foundation established under the auspices of the for-profit entity undertakes validation and verification of CDM	Tokyo, Japan		1, 2, 13		

	projects

Entity Name (short name)	Principal activities	Location of HQ	2005 profits (as reported in financial statements of the Annual Report)	Sectoral scopes for validation	Sectoral scopes for verification and certification	URL
Bureau Veritas Quality International Holding S.A. (BVQI Holding S.A.)	Performs inspection, verification and certification of projects, products or systems, using its own benchmark references or external standards	Paris, France	Approximately US$2.1B	1, 2, 3	1, 2, 3	http://www.bureauveritas.com
SGS United Kingdom Ltd. (SGS)	SGS is a worldwide company that describes itself as a world leader in certification, verification, inspection and testing.		Approximately $US128M	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 15	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 15	http://www.climatechange.sgs.com
The Korea Energy Management Corporation (KEMCO)	Services include energy audits and surveys, promotion of energy efficiency, energy-saving programs and climate change mitigation.	Yongin, Korea		1		http://www.kemco.or.kr/english/index.asp
TÜV Industrie Service GmbH, TÜV Rheinland Group (TÜV Rheinland)	Partner of TUV-SUD, "provides support including industrial safety, cost management, occupational health and safety and environmental protection.	Munich, Germany	$US89.1M	1, 2, 3, 13		
KPMG Sustainability B.V. (KPMG)	Part of the global firm KPMG. The Netherlands offices provides audit, tax, advisory and "sustainability" services, including CSR strategy, audits, and measurement, and verification and validation of CDM and JI projects	Amsterdam, the Netherlands	$US773.1M (September 2004)	1, 2, 3		http://www.kpmg.nl/site.asp?id=40378&process_mode=mode_doc&doc_id=40388
British Standards Institution (BSI)	BSI is a global firm that provides certification of management systems, product testing services, development of standards, information standards. It provides pre-validation assessment, validation and verification.	GHG offices are headquartered in Virginia and Ontario. Global HQ is in London, UK.	$US445.5M	1, 2, 3		http://www.bsiamericas.com/GHG/Services/index.xalter

Entity Name (short name)	Principal activities	Location of HQ	2005 profits (as reported in financial statements of the Annual Report)	Sectoral scopes for validation	Sectoral scopes for verification and certification	URL
Spanish Association for Standardisation and Certification (AENOR)	Membership organization for standardization and certification in industrial and service sectors.	Madrid, Spain	N/A	1, 2, 3	1, 2, 3	http://www.aenor.es/desarrollo/inicio/home/home.asp
TÜV NORD CERT GmbH (RWTUV)	German technical service provider specializing in We owe our leading market position to our technical competence and a wide range of consulting, testing Systems, Mobility, Certification, Energy and Systems Engineering, Academy and International Divisions.	Hannover, Germany	US$31.9M	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13	1, 2, 3	http://www.tuev-nord.de/english/index.asp
Korean Foundation for Quality (KFQ)	Management systems certification organization	Seoul, Korea	Info not available on their website	1, 2, 3		http://www.kfq.or.kr/type2/index.asp (in Korean only)
Pricewaterhouse Coopers - South Africa (PwC)	Provides assistance on reporting, performance and adopting new regulatory requirements.		Info not available on their website	1, 2, 3		http://www.pwc.com/za/eng/about/main/index.html
Lloyd's Register Quality Assurance Ltd (LRQA)	Provides business assurance, help clients use management systems to reduce risk. Provides certification of compliance with international management system standards.	London, UK	Info not available on their website	4, 5, 6, 7, 10, 11, 12, 13		http://www.lr.org/industries/lrqa/

Table 2: Breakdown of accredited DOEs by sectoral scope

Scope Number	Sectoral Scope	DOEs accredited for validation	DOEs accredited for verification
1	Energy industries (renewable - / non-renewable sources)	JQA DNV-CUK SGS-UKL TUEV-SUED TUEV-RHEIN JACO JCI AENOR BVQI KPMG RWTUV KEMCO KFQ TECO BSI PriceWaterhouseCoopers	 DNV-CUK SGS-UKL TUEV-SUED AENOR BVQI RWTUV
2	Energy distribution	JQA DNV-CUK SGS-UKL TUEV-SUED TUEV-RHEIN JACO JCI AENOR BVQI KPMG RWTUV KFQ TECO BSI PriceWaterhouseCoopers	 DNV-CUK SGS-UKL TUEV-SUED AENOR BVQI RWTUV
3	Energy demand	JQA DNV-CUK SGS-UKL TUEV-SUED TUEV-RHEIN JACO AENOR BVQI KPMG RWTUV KFQ TECO BSI PriceWaterhouseCoopers	 DNV-CUK SGS-UKL TUEV-SUED AENOR BVQI RWTUV
4	Manufacturing industries	JQA DNV-CUK SGS-UKL TUEV-SUED RWTUV LRQA	 DNV-CUK SGS-UKL TUEV-SUED
5	Chemical industries	JQA DNV-CUK SGS-UKL TUEV-SUED RWTUV LRQA	 DNV-CUK SGS-UKL TUEV-SUED
6	Construction	JQA DNV-CUK SGS-UKL TUEV-SUED RWTUV LRQA	 DNV-CUK SGS-UKL TUEV-SUED

Scope Number	Sectoral Scope	DOEs accredited for validation	DOEs accredited for verification
7	Transport	JQA DNV-CUK SGS-UKL TUEV-SUED RWTUV LRQA	DNV-CUK SGS-UKL TUEV-SUED
8	Mining/mineral production	DNV-CUK	DNV-CUK
9	Metal production	DNV-CUK	DNV-CUK
10	Fugitive emissions from fuels (solid, oil and gas)	JQA DNV-CUK SGS-UKL TUEV-SUED RWTUV LRQA	DNV-CUK SGS-UKL TUEV-SUED
11	Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	JQA DNV-CUK SGS-UKL TUEV-SUED RWTUV LRQA	DNV-CUK SGS-UKL TUEV-SUED
12	Solvent use	JQA DNV-CUK SGS-UKL TUEV-SUED RWTUV LRQA	DNV-CUK SGS-UKL TUEV-SUED
13	Waste handling and disposal	JQA DNV-CUK SGS-UKL TUEV-SUED TUEV-RHEIN JCI RWTUV LRQA	DNV-CUK SGS-UKL TUEV-SUED
14	Afforestation and reforestation	TUEV-SUED	
15	Agriculture	DNV-CUK SGS-UKL TUEV-SUED	DNV-CUK SGS-UKL TUEV-SUED

Source: http://cdm.unfccc.int/DOE/scopes.html

[i] Companies' information drawn from the companies' websites; information about accreditation drawn from: http://cdm.unfccc.int/DOE/scopes.html

[ii] Converted to USD at xe.com.

[iii] Total assets listed because Annual Report information unavailable