Management and Impacts of Climate Change Programme
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2/01 – Requirements for the developmental additionality of the CDM and role of official development assistance

Summary of Final Report

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The research carried out includes three methodological evaluations of CDM-type projects in the energy demand sector concerning diffuse emission sources, with a progression from small-scale to larger-scale projects.

The first evaluation concerned a CDM project that aimed to improve the energy efficiency of refrigerators in Brazil. To achieve this, we considered an imaginary scheme according to which the Brazilian government would offer a rebate on high performance refrigerators - i.e. refrigerators that use less electricity than a given baseline equipment - proportional to the quantity of emissions thus avoided. The baseline value is defined in a 'conservative' way, as a socially optimal technology, a method widely used for determining energy efficiency standards. In order to test this scheme, we developed a simulation model of the Brazilian demand for refrigerators. According to the results, the distortions in the price of electricity, plus the financial constraints that disadvantage poor households, may induce, on the one hand, wide discrepancies between the business-as-usual scenario and the theoretical baselines, and, on the other, a high rate of free-riding – the latter appearing all the more prohibitive since it mainly benefits the richest households. These findings highlight the limitations, for the residential sector, of a brutal application of CDM procedures, and the need to adapt the CDM to the social and institutional constraints of developing countries by taking into account the various obstacles to the development of projects.

This is the approach we adopted for the second evaluation study, which concerned the diffusion of natural gas technology for vehicles in the urban passenger transport systems (private cars and buses) of Delhi. The adoption of this technology appears as a 'no-regrets' option to the richer section of the population (although no spontaneous spread of the technology was recorded), but the constraint in terms of capital is very severe for the bus companies. The deficient natural gas distribution system of the city and the large number of different actors involved (technological, institutional and commercial) appear as the main obstacles to the implementation of the project. Our study includes the specifications of a CDM project according to which the funds obtained are not used to lower the price of the vehicles but instead to remove the obstacles and finance both a natural gas distribution system and an emission surveillance system while at the same time offering incentives to adopt domestic policies and measures (diesel oil tax).

The third case study is more ambitious. Is it possible, within the framework of the CDM, to consider the implementation of projects even closer to development policies such as urban development policies or the funding of infrastructures? The two previous studies did not focus on projects that would trigger a major bounce-back effect in the final service demand, and the calculations of emission reductions could be done by improving the energy efficiency coefficient with a fixed final demand. In this last study, we examine the bounce-back effect *via* projects to control the final demand for urban passenger transport. For a project to be eligible for the CDM, the assessment of the benefits generated by the project raises special problems for model-designers, who need to anticipate both the modal shift and the impact on the absolute level of the final demand for transport service. The description of the behaviours of the different social categories of Delhi's population highlighted strategic behaviours according to location of residence and transport cost and time. This led us to elaborate a modelling architecture of the modal demand for transport, taking into consideration financial and time constraints for users, which reveals the inescapable complexity of measuring the emission reductions in such projects. While in the previous study it was possible to fix the avoided tonne conventionally, in this case transaction costs, even when high, will not suffice to override major uncertainties. In this case, owing to high inertia, keeping to the strict measurement of reductions at a particular instant of time t leads one to underestimate the long-term value of the non-emitted tonnes that induce irreversible structural consequences and modify future reduction costs. This covers much more than the mere notion of CDM project, but it now becomes clearly visible that climate policies cannot any longer be separated from development policies.

This dimension of the problem could lead to the exclusion of low-income countries for which investments, and in particular infrastructure investments, largely depend on official development assistance (ODA) funds, whereas larger countries, which are the main recipients of direct foreign investments and are capable of marshalling resources locally, would be able to include their own infrastructure investments in the CDM. An opportunity for linking climate policies with the various ways of financing development should focus on covering the specific risks associated with the funding of these projects, so as to restore geographical homogeneity and make countries with high needs of investments more attractive to foreign investors.