

Transportation and Greenhouse Gas Emissions

**Exploring Opportunities for the
Clean Development Mechanism
in Chile**

**Highlighting Project Conclusions
December 2004**



Project Overview

In December 2004, the International Institute for Sustainable Development (IISD), Climate Change and Development Consultants (CC&D) and the Center for Clean Air Policy (CCAP) concluded a project that examined possible scenarios for using the Clean Development Mechanism (CDM) as a tool to promote sustainable development in Chile's transportation sector. Mobility challenges, strong modelling capacity, commitment to the CDM and excellent data all made Chile an ideal location to test transportation solutions. The project, which began in October 2002, analyzed three case studies of how the CDM may be used to address technological and demand-side solutions for reducing emissions from Santiago's transportation sector.

What is the CDM?

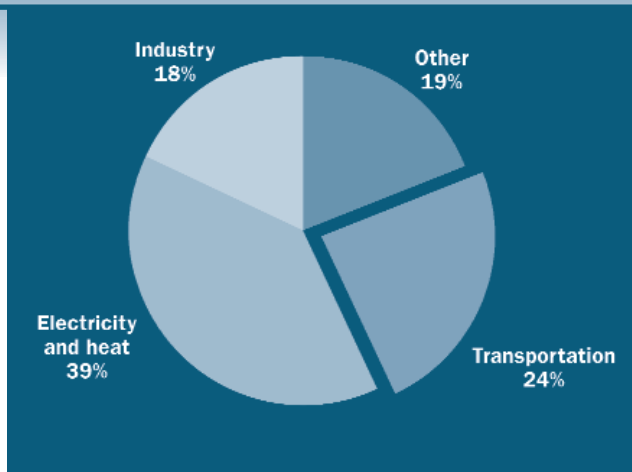
The *Clean Development Mechanism (CDM)*, as outlined in Article 12 of the Kyoto Protocol and elaborated in the Marrakech Accords, is a project-based mechanism that allows public or private entities to invest in greenhouse gas (GHG) mitigating activities in developing countries and earn abatement credits, which can then be applied against their own GHG emissions or sold on the open market. In addition to reducing emissions, CDM projects have the dual objective of contributing to the sustainable development of the host country.

Source: Canada's CDM/JI Office
<http://www.dfait-maeci.gc.ca/cdm-ji/cleandev-en.asp>

Globally, the transportation sector is responsible for almost one quarter of carbon dioxide (CO₂) emissions. This share is increasing annually in many countries, particularly those in the developing world. With the population in developing countries expected to double by 2030, transportation emissions are a serious issue for urban centres.

This unabated growth of the transport sector highlights the importance of monitoring and reducing greenhouse gas emissions. In Chile, as in most developing countries, transportation is the largest source of energy-related carbon dioxide (CO₂) emissions which are projected to almost double by 2020 in the absence of mitigation measures. Increases in emissions are accompanied by augmented risks of local air pollution; health impacts; congestion; noise pollution; traffic accidents; and more.

The Clean Development Mechanism (CDM) offers the possibility to increase funding for transportation



2001 Global CO₂ Emissions by Sector (IEA, 2003)

Source: CO₂ Emissions from Fuel Combustion 1970/2001-2003 Edition. Paris, IEA/OECD.

projects; enhance local planning and project evaluation capacity; and expand technology transfer opportunities. However, there are difficult challenges to overcome before these projects become more feasible to undertake.

Case Studies: Highlights

Through three different case studies, the project examined baseline development and questions of additionality, monitoring and data requirements for technological as well as demand-side emission-based reductions. Below is a brief description of each, as well as primary conclusions.

Bicycle Infrastructure

This analysis examined two scenarios: an individual bikeway and a comprehensive network. Key conclusions were:

- *Individual bikeways* do not appear viable as CDM projects given current rules and the expected value of certified emission reductions (CER).
- *A comprehensive bicycle network* may be more feasible with higher savings and reduced monitoring costs



using regional travel data. This would likely require a policy-based and/or sectoral CDM approach.

- *Improving the cultural image of cycling* (e.g., with promotional campaigns) will be as important as high quality infrastructure.
- *Increasing bicycle use* requires efficient land use policies to enable shorter trips.

Bus Technology Switch

Transantiago is the transportation master plan for the Santiago metropolitan region; it outlines all major transportation infrastructure and investment requirements over the coming years. *Transantiago* includes new requirements for the efficiency of public buses. This analysis assessed the feasibility of employing the CDM to promote additional technology improvements. Key conclusions were:

- It is possible to establish an acceptable methodological framework for the CDM.
- An agreement on emission factors (for various technologies) would minimize uncertainty and could potentially lower project development costs.

- The marginal return may be too small to attract significant investment.
- Improvements to bus technology offer lower GHG savings than reducing the number of buses or displacing car trips.
- *Transantiago* defines the future for public transportation projects, and makes baseline development clearer (assuming the initiative unfolds as planned) by providing assumptions about penetration of new technologies and plans for municipal expansion.

Location Efficiency

In Santiago, urban area growth is occurring at a rate 70 per cent faster than population growth. This rapid land conversion has important implications for transportation infrastructure provision and air quality. The “location efficiency” concept rests on the premise that influencing land patterns can produce fundamental changes in individual travel behaviour and thereby influence transportation emissions. This analysis assessed the potential for reducing transportation GHGs by changing patterns of urban development. Key conclusions were:

- Location efficiency represents a significant opportunity for emission reductions, with considerable co-benefits.
- The methodologies are data- and capacity-intensive.
- Monitoring is difficult, though not impossible.
- The current CER price is unlikely to provide an incentive against overall urban development costs.
- Given the strong influence that development patterns have on travel behaviour, it is important to pursue policies and measures to promote location efficiency and better integrate transportation and land use planning.
- Allowances for policy-based or sectoral CDM would make location-efficient initiatives more feasible as data sources are more readily available at the regional level.

International Transportation Workshop

The Government of Chile and the project partners hosted an international workshop on Transportation and the CDM in August 2004. Over 100 participants from the public, private and non-profit sectors of over 15 developed and developing countries attended.

Participants agreed that given rapid growth in transportation emissions, and the clear sustainable development benefits from reductions in the sector, the CDM must become more accommodating to transportation projects. Progress is needed in the following areas:





- Expanding CDM capacity building efforts.
- Managing uncertainties: accounting for leakage, building more robust data collection systems.
- Better integrating the value of reduced travel demand and co-benefits (e.g., congestion, local air quality, health) into urban development planning.
- Simplifying methodological (additionality) requirements for transportation projects.
- Examining potential alternative structures for the CDM in a second commitment period (e.g., sectoral or metropolitan targets).

The workshop made clear that technological solutions bring us only part of the way; demand-side measures such as public transit improvements and efficient land use policies are crucial to slowing rapid growth in transportation emissions.

Two specific recommendations for Parties to the Kyoto Protocol emerged from the workshop:

- 1) Parties request that Methodological Panel of the CDM Executive Board *conduct an analysis on methodologies for transportation and the CDM* that would include *an analysis of urban land use* and the CDM as well as identify data and capacity needs.
- 2) Parties request that the United Nations Framework Convention on Climate Change (UNFCCC) host a formal workshop on issues related to *urban transportation and climate change*.

Cross-Cutting Issues

Despite their emission reduction potential, projects in the transportation sector have been slower to develop than those in other sectors. Such projects, especially demand-side initiatives, face significant methodological

and financial barriers. The project examined some of these cross cutting issues:

Methodological challenges

One of the primary challenges with transportation projects under the CDM is additionality. Misinterpretation of *additionality* rules has the potential to harm the CDM, either by granting credits where business-as-usual activities are presented as projects, or by focussing on overly strict interpretations and making beneficial projects infeasible. A combination of high costs of transportation projects, low prices for CERs and low monetary value of co-benefits makes establishing additionality very challenging for transportation projects. Specific recommendations on the issue of additionality from the research in Chile include considering committed funding as an additionality measurement; initiatives (projects or policies) planned *but not funded* should not be considered “business as usual.”

Development of *baselines and verification* of emission reductions are further stumbling blocks. Baseline scenarios must reflect actual circumstances, (vs. official standards that in many cases are not being met) and should be developed to reflect changes in technology and policy



over time. Improvements in data collection; forecasting ability; incorporation of non-motorized trips; and consideration of policy impacts over time can all contribute to stronger methodologies. Robustness must be balanced with practicality and consideration must be given to the multiple co-benefits from transport projects.

Those projects that fit within current CDM rules have limited impact on long-term emission trends. Projects that address fundamental structural change (e.g., bus rapid transit and fuel economy standards) offer major GHG reductions but do not fit well into the project-based structure of the mechanism.

CDM: Looking forward

As countries work toward reductions for the first commitment period, negotiations commence in 2005 for the next commitment period. Further examination of the architecture *post-2012* should take transportation into account and provide greater sustainable development incentives for developing country participation by expanding the scope of the CDM to cover sector-wide or policy-based activities.

To capture emission reductions from transportation under the CDM, research confirms the *need for reform* of the mechanism and how it is applied. Efforts should be made to build upon the infrastructure already in place; introduction of entirely new institutions would lead to high levels of uncertainty and may undermine the currently fragile carbon market. A range of reform options exists to promote transportation within the CDM.



Parties should examine taking a *sectoral approach* to emission reductions, which would help overcome the competitiveness concerns of industry related to the current structure of the CDM. A sectoral structure could incorporate technology standards and may contribute to future additional reductions by non-Annex 1 Parties. Taking comprehensive approach at a metropolitan level would better address travel demand and lead to more sustainable and comprehensive reductions.

Incorporating the impacts of demand-side measures could potentially be addressed by viewing *de facto* new policies as projects under the CDM. For example, project developers could be eligible for tax credits if they undertake urban development in the city core, or industries purchasing fleets of vehicles could be eligible for subsidies for voluntary measures such as upgrading to less GHG-emitting technology. Allowing policies as projects reverses the “perverse incentive” concern by stimulating developing countries to introduce measures that address GHGs. As in standard projects, proponents would need to prove that the value of the CER bridged a barrier to the project going forward. While the difficulties of double counting and measurement certainly would need to be addressed, there is considerable opportunity for policies as projects to reduce GHGs in the transportation sector, particularly those related to travel demand.

Just as small scale and renewable projects are recognized for their sustainable development benefits and have received special treatment under the 2001 Marrakech Accords, *alternate methodologies and procedures* could be developed for projects in the transportation sector. Further guidance on additionality requirements for transportation projects could be provided that would facilitate additional project development.

Finally, *financing* for CDM project development continually serves as a barrier. Additional incentives, increased support from Annex 1 Party governments, valuation of co-benefits and better use of Official Development Assistance (ODA) are all needed. Climate change (both mitigation and adaptation) and sustainable transportation should also be more fully integrated into the funding frameworks of the International Monetary Fund, the World Bank, regional development banks and official Poverty Reduction Strategy Papers.

Sustainable transportation

Reducing the length and number of trips is seen as a key issue for the future relevance of the CDM. Technology projects that focus on vehicle efficiency and fuel carbon content do not address the full transportation picture—fundamental change in transportation emissions requires policies and measures to slow growth in *travel demand*.



Enhanced public transportation and more efficient land use development patterns can have very significant implications for travel-related emissions at the regional and neighbourhood levels; this is primarily a “behavioural” change, *not* a technological one.

It is important to recognize the high *opportunity costs* of not investing in sustainable transportation infrastructure and pursuing complementary land use policies. Given the rapid growth in car ownership and use, planning early for transportation alternatives is crucial. Current infrastructure, investment and development decisions have a major impact on future emissions and implementing sustainable solutions (bicycles, public transport) now can advance multiple public goals. These changes, however, will require deliberate planning, investment and political will; the CDM can only play a small part in a larger framework of planning for sustainable development.

While international assistance through ODA or CDM can kick-start reform, it cannot force local change. Local governments need to make the final decision for more *sustainable transportation*. Long-term sustainability solutions are only politically viable if they are accompanied by tangible short-term benefits (e.g., health, congestion relief). Metropolitan “visioning” processes can be a powerful tool to educate leaders and arm them with the information needed to champion implementation. Further, allowing for policy-based or sectoral CDM

could better accommodate structural changes such as comprehensive transit and land use strategies, fuel economy standards and renewable fuel standards.

These and other issues are explored in further depth in the final report of the project, available in January 2005.

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For more information on the project, including case studies and materials from the international workshop, see:

<http://www.iisd.org/climate/south/ctp.asp>

