

Reducing Greenhouse Gases

GHG Analysis in Transport

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The World Bank is applying to transport initiatives a new and distinctive method of greenhouse gas (GHG) analysis as part of its comprehensive GHG accounting policy.

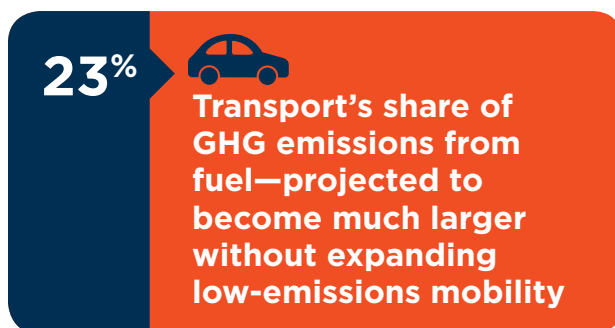
In transport, choices by travelers determine usage—and a fundamental trend in much of the world is strongly boosting GHG emissions: the massive rise in motorization as household incomes and technical advances make it affordable. This tendency will push transport fuel emissions much higher unless projects sharply expand the opportunities and incentives for users to adopt low-emission modes.

The World Bank's GHG analysis for transport shows whether a given transport project can help lower the trajectory of the sector's GHG emissions. A central feature is an estimate of the wider social costs of emissions under various modes—for example, air pollution and accidents—as well as climate change. Including them greatly increases the demonstrated benefit of emissions-reducing projects and thus will also help accelerate the move to a sustainable transport sector.

Unlike other sectors, transport requires a behavior-oriented method of GHG accounting. In activities such as manufacturing and power generation, the project itself can largely determine the emissions outcome. In transport, choices by users determine outcomes. Modes and use of transport continually change—witness the rising use of fuel-efficient cars, car sharing, and, in some parts of the world, nonmotorized transport. GHG analysis in transport must therefore understand how user behavior will evolve both with and without a proposed project.

Targeting Motorized Transport

Transport policy itself must confront a fundamental trend in areas where average household income



moves above a lower middle-income threshold: a massive increase in motorization (including a switch to larger vehicles when fuel efficiency makes it affordable). The trend is strongly raising the growth trajectory of GHG emissions. Without policy action, the transport sector's share of GHG emissions from fuel will rise much higher—perhaps to more than half by midcentury.

Technology innovations are necessary, but alone they cannot halt the prospective rise in GHG emissions. Automobile travel, attractive to consumers individually, causes problems for all, particularly in cities: the exponential rise of time lost in traffic, the high health costs of local air pollution, and road accidents that take a global toll of 1.2 million lives each year.

To address these trends effectively, GHG analysis must be able to realistically show how emissions and other costs associated with motorized transport can be avoided without damaging transport's essential role in development, trade, and the functioning of cities.

GHG Analysis Fuels Smart Investment

Transport infrastructure and the commercial and residential patterns it shapes are long lived. Therefore, the modes of travel established by today's transport investments will largely be fixed for the next 50 to 70 years. An essential element of transport-specific GHG analysis is a long-term view that accounts for the evolving constraints on fossil fuel supplies, costs, and usage as well as other aspects of user choice.

By evaluating a project against a baseline that accounts for the long-term picture, GHG analysis can show whether a particular investment—whether in road traffic flow, mass transit, inland waterways, or freight and passenger railways—can realistically cut emissions over a given period. It will be especially influential in low-income countries with relatively little infrastructure, where it can help inform a strategy of lower-emissions transport investments that will produce major savings as economic development progresses.

Likewise, in the case of a country with a highly developed road sector, the analysis can help sort out which investments will or will not help cut motor vehicle emissions. In areas with congested traffic, emissions per vehicle-kilometer are extremely high. GHG analysis can support projects in these areas if they can be shown to improve traffic flow without simultaneously inducing more traffic and higher emissions—a bounce-back that will likely follow in the absence of measures to induce the use of alternative modes.

The Analysis Embeds Carbon Costs

To cut emissions in practice, investments in low-emission modes must often include a demand management component. Will drivers shift to mass transit? Inducing the shift will require a price signal to users that reflects the total costs of GHG emissions.

To that end, the World Bank has defined a path of current and future carbon prices reflecting the locality-based social costs of carbon—congestion, pollution, and accidents as well as climate change. The new method of analyzing GHG emissions in transport quantifies the user response to such prices. It can thus identify the policy signals needed to induce shifts in mode and technologies that will achieve targeted reductions in GHG emissions.

Ultimately, the GHG analysis quantifies the monetary benefits of lowered emissions over a given period with a calculation that multiplies the physical reduction by the social cost of carbon. The closer the project comes to attaining this value added, the greater will be the internal rate of return.

Leading the Way To a Low-Emission Transport Portfolio

Quantifying the social value of carbon reductions gives transport investments a much larger role in policies to mitigate climate change. The pivotal fact is that the wider social costs encompassed in the GHG analysis (the effects of congestion, local air pollution, and road safety risks) are much larger for a given locale than climate effects alone. Accounting for them gives a critical boost to the benefit-cost ratio of emission-reducing projects. That is why allocating transport investments on the basis of such a broad measure of value added should be effective not only in reducing GHG emissions, but also in accelerating the transition to a sustainable transport sector.

► For more information on this topic:
<http://www.worldbank.org/en/topic/transport/brief/low-emission-transport>

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