Transport

Relevance of the transport sector for green growth in Macedonia

Transport figures prominently on the green growth agenda for two reasons. First, transport has major environmental impacts in terms of greenhouse gas emissions (GHG), local air emissions and noise. Managing congestion more effectively is also part of the broader agenda for more sustainable development and better use of resources invested in infrastructure. Green growth re-frames several existing concepts, including durable economic activity, reduced environmental impact and sustained growth in high quality jobs, under one banner. Governments should also consider tradeoffs among various policy objectives. Reducing emissions, for example, may increase costs to current road users in the short run. As green growth policies spread, it may be necessary to review the way the transport sector is taxed and contributes to aggregate tax revenue. Assessment methodologies are relatively mature in this sector and the tools developed to support transport sector decision-making in some countries provide a good basis for the assessment of green growth policies across the economy. Reducing air pollution through a reduction of congestion, improved car vehicle fleet, and modal shift to public transport bring important local benefits in the form of improved health outcomes and reduced public expenditure on respiratory diseases, with reduced GHG as a co-benefit.

As a small emitter, one can question why a country such as Macedonia would want to implement mitigation policies. A comprehensive approach for addressing climate action in the transport sector in Macedonia needs to be seen within a framework that factors in broader considerations such as economic growth, as well as public finance and social impacts. It is clear that mitigation policies cannot come at the expense of economic growth, but must be supportive of economic growth and development, if they are to gain social and political acceptability. Mitigation policies also need to be seen within a broader context of co-benefits and “packaged” in a manner that reduces opposition. Poor air quality or high levels of congestion in a city can prompt policy makers to consider the introduction of a road pricing scheme, but this is only likely to gain public acceptability if accompanied by policies aimed at investing to improve public transport and alternative transportation modes, such as cycling. Pricing policies can provide the revenue that can be then be ploughed back into investments in public transport. While such a policy would reduce congestion, improve air quality, and reduce CO2 emissions compared to what they would have been otherwise, it is not necessary that such a policy be primarily sold to the public on a global public goods argument of reduced CO2 emissions.

Decoupling GHG emissions from the transport sector and economic growth or at least lowering the GHG intensity of future transport growth represents the key challenge and will require departure from the “business as usual” policies in the transport sector.\(^1\) As noted in the EU’s 2011 White Paper

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on transport, the main issue facing the transport sector is how to reduce the system’s dependence on oil without sacrificing efficiency and compromising mobility—curbing mobility is not an option, neither for the EU nor ECA.2 The World Bank’s own climate change strategy for the transport sector adopts a similar approach, arguing that climate change mitigation in the transport sector has to be seen in a broader context: sustainable transport should limit GHG emissions from transport and minimize other externalities, without compromising economic growth.3

As an EU candidate country, Macedonia needs to factor in eventual compliance with the EU’s transport policy which places a strong emphasis on GHG reduction. EU member states must also comply with the EU climate and energy package which sets specific targets for reducing GHG emissions.4 The package sets three targets, also known as the 20-20-20 targets for 2020: (a) cutting GHG emissions by at least 20 percent of 1990 levels by 2020; (b) cutting energy consumption by 20 percent of projected 2020 levels through improved energy efficiency; and (c) increasing the use of renewable energy to 20 percent of total energy production. For transport, excluding air transport, GHG emissions need to be cut to 10 percent below 2005 levels, through reduced carbon intensity of the vehicle fleet and increased transport efficiency. Economic development in Macedonia is expected to be followed by an increase of transport flows, in particular road haulage traffic. Consequently, the country needs to consider measures to shift the balance between modes in favor of rail transport for all trip lengths, for both freight and passenger journeys where economically and socially viable. Policies regarding the types of fuel used and their relevant taxation policies need to be assessed.

There has been a large increase in transport emissions in Macedonia, as in much of ECA, driven by growth in road transport demand. Figure 1 presents data on the growth of CO2 road emissions by country in ECA, while Figure 2 presents transport sector emissions by country. Growth rates of road transport CO2 emissions vary widely—from negative values to triple digit growth over 2000-08—while transport sector emissions reveal wide dispersion reflecting in part the size of countries, structure of economy, and level of development. The growth rate of road transport CO2 emissions in Macedonia exceeds that of the EU-15 and EU-27 over 2000-2008, although overall transport CO2 emissions remain among the lowest in ECA, reflecting in part the small size of the country. Nevertheless, the growth rate of road transport CO2 emissions is a cause for concern, as it suggests that unless there are changes in transport policy, such growth is likely to continue unabated going forward. According to the national GHG inventory prepared for the Second National Communication under the UNFCCC, the transport sector has had a rather stable contribution to total CO2 emissions, in the range of 10 to 13 percent.5 In the transport sector, key sources of emissions derive from road transport, which contributes 7.4 percent to the cumulative emissions of the country.

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5 Macedonia’s Second National Communication under the UNFCCC, page 73.
Countries in ECA face a substantial threat from climate change—with expected negative effects on transport infrastructure. Extremes in weather patterns such as intense rainfall, storms, and longer heat-waves can negatively impact road, rail and air transport. Changes in rainfall, which potentially include greater intensities and frequencies can engender landslides and erosion, destabilizing roads and rail lines. With long-lived investments often exceeding a 20 years life span, there is a unique opportunity to ensure that investments made today will not be adversely affected in future, due to a failure to consider issues such as increased flooding or increased precipitation that are likely to be the concomitant to climate change in the region. This is also an opportunity to identify new and innovative approaches to ensure both the resilience of land transport infrastructure investments, and the sustainability of the transport system itself, in Macedonia.
Planned activities on transport within the Program

This study will focus on mitigation in the land transport sector. To do this, there is a need to evaluate the change in transport demand over the 2040 timeframe and the resultant emissions of particulate matter (PM), carbon monoxide (CO), nitrogen oxides (NOx) and other GHG under a BAU scenario, the impact that could be achieved from changes in vehicle technology, and from other behavioral/regulatory changes that affect transport frequency, trip length and modal choices, both for freight and urban passenger transport. A particular area of focus will be Skopje and the potential for modal shift from road to rail.

Policies to reduce congestion and pollution in Skopje. This will review, among others, existing and planned (a) urban public transport investments and services; (b) parking policies; and (c) fuel efficiency and vehicle standards. The policy measures proposed will be mindful of EU policies concerning fuel taxes, fuel standards, air quality directives, vehicle standards, among others, as the baseline scenario, and then devise two alternative “green” and “greener” options, quantifying the impact on GHG emissions, congestion, and air quality. Setting appropriate energy efficiency standards for all forms of motorized transport would help reduce emissions. Importing used vehicles in significant quantities from other countries in Europe results in Macedonia having an older and less-efficient vehicle park. Phasing out of such standards, which would clearly reduce emissions, needs to be assessed in terms of its overall impacts on economic growth. Outlining the main aspects of an integrated urban plan would link urban development with transportation planning to improve access to goods and services whilst minimizing the need to travel. The output of this should be a package of policies aimed at curbing congestion and
pollution, while reducing GHG emissions or reduced growth of GHG emissions. The impact of fuel efficiency and vehicle standards should be modeled for Skopje.

The World Bank’s Energy Forecasting Framework and Emissions Consensus Tool (EFFECT) is a bottom-up engineering style model which allows open and transparent modeling and comparison of GHG emission growth for a range of development scenarios. This will be employed in Macedonia to create a tool to generate and discuss low carbon options with government experts and other stakeholders. On-road transport and rail are covered, with the outputs of the EFFECT model can be used as inputs to the marginal abatement cost curve (MAC) tool, a tool that can help to compare the costs of avoiding GHG emissions across a range of technologies. It allows for systematic, rigorous and consistent information aggregation to allow for the comparison of different sectors and mitigation/sequestration options.

Establishing the Marginal Carbon Abatement Curve (MAC) for the Transport Sector. It has been difficult to reduce emissions from the transport sector in low and middle income countries. Rising incomes in these countries has contributed to a rapid increase in motorization rates, which in turn has contributed to increasing emissions. In the case of Macedonia, an additional factor contributing to the increase in emissions from the transport sector has been the flourishing market in second hand cars. Important factors in estimating emissions from on-road passenger and freight road transport include the number of on-road vehicles, the types of vehicles in use, fuel efficiency of the vehicle fleet, total vehicle kilometers, average distance of a trip, mix of urban and long-distance trips, average speed and duty cycle of each vehicle, average occupancy rates in the case of passenger vehicles, and load factor in the case of freight, type and carbon intensity of the fuel consumed.

On the adaptation side, the intention of this analytic work is not just to model the sectoral impact of adaptation under different assumptions but to provide the Government with a strategy integrated around a mix of incentives. The primary objective is to identify all potential adaptation measures suitable for introduction in this context, assess their relevance, and provide a preliminary assessment of the costs and benefits of key measures. The secondary objectives of the study are to: (a) identify the need for adaptation in Macedonia's land transport sector, including the economic costs and benefits of potential policies; and (b) preparing a detailed Action Plan for the implementation of identified and agreed measures. The tasks to be carried out include but are not limited to the following:

- Quantifying impacts of climate change, climate variability and extreme weather events on road and rail infrastructure and services;
- Analyzing the implications of climate change on engineering design, transport asset management, and associated costs;
- Developing guidelines outlining the changes to be made to the existing regulations, design standards and operational procedures to make road transport resilient to climate change and reduce economic risks. This should also include identifying measures to establish effective early warning systems and aftermath management, and costing such measures; and
- Preparing a detailed Action Plan for the implementation of identified and agreed adaptation measures and presenting the findings to regional and local workshops.