Energy Demand Analysis and Energy Saving Potentials in the Greek Road Transport Sector

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Abstract
The Greek road transport sector is simulated in this paper in order to analyze the current status of energy demands and pollutant emissions for a variety of future scenarios and policies.

A forecasting transport model has been developed using the Long-Range Energy Alternatives Planning System (LEAP) software. The LEAP model is used to estimate total energy demands and the associated emissions for the base year 2010 and extrapolated till 2035 for future scenarios and predictions. Base lines of the energy consumption and CO$_2$ equivalent emissions of the road transport sector in a business-as-usual (BAU) scenario are estimated employing a vehicle stock-turnover modeling approach. Apart from the business-as-usual scenario, the model is run under 17 alternative scenarios that include: a) substitution of conventional fuels by alternative fuels along with improved fuel economy of vehicle engines, b) increased efficiency, and c) introduction of alternative technologies. All scenarios are evaluated to study the impact of different transport policies and their impact to energy demand and emissions in the Greek transport sector. The main objective is to present alternative solutions and policies which limit the future growth of energy demand as well as air pollutant emissions. The resulting energy demands and the CO$_2$ emissions under each scenario were compared with the base line case of the BAU scenario. The implementation of improved fuel economy vehicles combined with alternative fuels and technologies have a significant potential to reduce energy demand and mitigate pollutant emissions in this sector.

References
Subhes C. Bhattacharyya, Govinda R. Timilsina, 2009 "Energy demand models for policy formulation, A comparative study of energy demand models".