The Reduction of CO2 Emissions Level in Malaysian Transportation Sector: An Optimization Approach

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Abstract : Transportation sector represents more than 40% of total energy consumption in Malaysia. This sector is a major user of fossils based fuels, and it is increasingly being highlighted as the sector which contributes least to CO_2 emission reduction targets. Considering this fact, this paper attempts to investigate the problem of reducing CO_2 emission using linear programming approach. An optimization model which is used to investigate the optimal level of CO_2 emission reduction in the road transport sector is presented. In this paper, scenarios have been used to demonstrate the emission reduction model: (1) utilising alternative fuel scenario, (2) improving fuel efficiency scenario, (3) removing fuel subsidy scenario, (4) reducing demand travel, (5) optimal scenario. This study finds that fuel balancing can contribute to the reduction of the amount of CO_2 emission by up to 3%. Beyond 3% emission reductions, more stringent measures that include fuel switching, fuel efficiency improvement, demand travel reduction and combination of mitigation measures have to be employed. The model revealed that the CO_2 emission reduction in the road transportation can be reduced by 38.3% in the optimal scenario.
Keywords : CO_2 emission, fuel consumption, optimization, linear programming, transportation sector, Malaysia
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