Climate change consequences due to CO₂ emissions are one of the main externalities related to freight transport. The constant increase of their level is in countertrend with all the civil sectors. Most of the recent European strategies are trying to adopt adequate measures to address this critical condition, without limiting freight circulation. Some of such measures are related to the efficiency of the vehicles and to the introduction of alternative fuels. Others focus more on the political measures, aiming at a modal shift towards less polluting transport systems. This can be obtained both through the adoption of bans and higher taxation, and through the increase of attractiveness of less polluting systems (e.g., improvement of existing railway lines and multimodal centers, realization of high capacity railways).

Normally, only the tank-to-wheel phase is considered for the evaluation of CO₂ effectiveness of these measures, thus underestimating their potential. This paper describes a methodology to develop a complete well-to-wheel analysis, able to forecast the real impacts of freight transport and its economic evaluation under different political and technological assumptions.

A case study along a main transalpine corridor is then presented, where the issue is particularly relevant due to the quantity of freights transported and the territorial geomorphological conditions (in mountain areas, CO₂ emissions can be up to five time higher than in plain, according to the gradient). The case study gives concrete results in terms of possible economic savings deriving from the reduction of CO₂ emissions, showing the difference with tank-to-wheel analysis and constituting a valid tool for the development of a freight strategy in line with European and National trends.