How the inclusion of life cycle impacts affects transport cost-benefit analysis - DTU Orbit

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Transport cost-benefit analysis frameworks do not consider the environmental impacts deriving from the life cycle of the transport system’s components. This leads to an inaccurate representation of the environmental impacts of transport projects, which can be instead more thoroughly represented by life cycle assessment methods. In the present study, we describe a transport cost-benefit analysis model combined with a life cycle assessment module developed based on life cycle ReCiPe 2016 methodology. The suggested approach makes it possible to include the life cycle impacts on human health, ecosystem and natural resource depletion in the project assessment. We discuss the methodological issues of combining cost-benefit analysis and life cycle assessment in transport appraisals. We illustrate the results from the application of the model to a transport case study related to the construction of a new fixed link across the Roskilde Fjord in Frederikssund (Denmark). The analysis shows that the environmental impacts deriving from the life cycle of the system components notably affect the key indicators of the model output, such as benefit-cost ratio and net present value. The results from the model are then tested through sensitivity analysis related to some of the assumptions made for the study. The study concludes that the inclusion of life cycle impacts in transport cost-benefit frameworks allows taking into account environmental costs and benefits otherwise not accounted for, thereby providing to the decision makers a more exhaustive information about the environmental impacts of the project.

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