Life Cycle Assessment of intermodal freight transport in Belgium

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Introduction

Intermodal freight transport consists in the shifting of road freight transport in long distances to others modes of transport with improved environmental performance such as rail freight transport and inland waterways transport. At the intermodal terminal, the goods are transferred between modes of transport. Firstly, we have carried out the Life Cycle Assessment (LCA) of rail freight transport, inland waterways transport and road transport independently. Then, we have studied the environmental impacts related to intermodal freight transport.

LCA of the freight transport in Belgium

LCA of an intermodal transport route

- In collaboration with Terminal Container Athus (Belgium), we have collected data in both the intermodal route "Port of Antwerp - Terminal Container Athus" and the handling of containers in the intermodal terminal.
- We have considered a consumption of 16 560 kJ/TEU [1] for the transhipment in Port of Antwerp, a gross weight of 14.3 t/TEU [2] and a capacity of 70.3 TUE/train and 2 TUE/Lorry.

Road transport is the shortest possible route, but is it worth from an environmental point of view?
- Diesel trains reach the maximum impact in 4 indicators mainly as a result of the exhaust emissions. Electric trains show the maximum impact in 3 indicators, being 2 of them related with the radiation due to the use of nuclear power in the electricity production.
- The art. Iery of 34-40 t Euro VI presents the maximum impact in 6 indicators. For the indicators photochemical ozone formation, acidification and terrestrial eutrophication, it has a lower impact than diesel trains due to the lower exhaust emissions on NMVOC and NOx of the Euro VI engine technology.

Conclusions and perspectives

1. Intermodal freight transport represents an opportunity to attain a more environmentally and health friendly, energy-efficient and competitive transport system.
2. Study of how the possible increase of rail freight transport in the modal split affects the environmental impact of inland freight transport in Belgium.


Production

End-of-life

Lorry

Raw materials

Production

End-of-life

Lorry

Raw materials

Production

End-of-life

Lorry

Raw materials

Production

End-of-life

Lorry

Raw materials

Figures: 1. Inland freight transport system boundaries; 2. Intermodal route "Port of Antwerp - Terminal Container Athus (Belgium)"