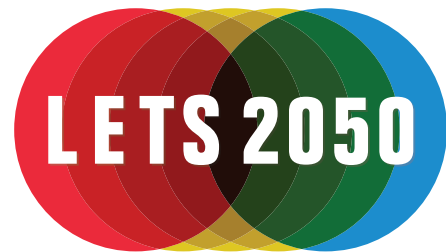


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Abstract

Explaining the Cyclic Behavior of Freight Transport CO₂-Emissions in Sweden over Time

Economic growth is often considered to be the main factor behind and tightly coupled to the increase in freight transport work and its energy use. Recent research has quantified the relative contribution from underlying factors like value density of products, transport intensity and carbon intensity of fuel. In this work we rely on the theory of economic growth cycles in order to explain the dynamic behavior of some of these indicators. Focusing on the current growth cycle, we analyze Swedish data in a Shapley decomposition model, and the behaviors of the underlying factors are confronted against the growth cycle theory and recent findings in micro logistics.

Our results suggests that the different and changing relations between growth and emission over the growth cycle indicate that the observed development in emissions is far from linear and cannot be explained straightforwardly by economic growth. The impact of the respective factor, and the relation between them, changes over time and results in different degrees of decoupling. The general trend is that micro oriented factors tend to be more important in the rationalization period while macro oriented factors have a stronger impact during the transformation period. We suggest that our approach might be useful not only for analyzing historical data, but also for medium-term and long-term scenarios for freight transport development and CO₂-emissions.

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