Comparing and addressing greenhouse gas emissions in supply chains

"UNDERSTANDING THE CO2 EMISSION IMPACT FROM A CHANGE OF TEXTILE CONSTRUCTION AT IKEA - A SUPPLY CHAIN APPROACH" – original title

Alice Ahlinder, Department of Industrial Management and Logistics, LTH

There is an urgent need to reduce greenhouse gas (GHG) emissions to limit global warming. Companies and businesses are crucial parts to make this reduction happen. Global supply chains account for a lot of GHG emissions, often many times the amount of emissions of the company's own operations. Due to the complexity of today's supply chains, these emissions are hard to compare and address. Using life cycle assessment, the GHG emissions connected with supply chains of mattress cover textiles at IKEA could be compared.

The suppliers that companies work with directly also have suppliers, these suppliers also have suppliers and so on. This creates large systems which can also be spread all around the globe. The suppliers in these chains could be of different sizes, use different production technologies and use different energy sources. These differences all effect the greenhouse gas emissions for the suppliers. This makes it challenging to calculate the greenhouse gas emissions for an entire supply chain. An industry especially known for its long and complex supply chains is the textile industry.

This study focused on textiles for mattress covers at IKEA. More specifically on a change of textile constructions for these covers that IKEA is going to implement. The study was written as a multiple case study. There were three cases based on different textile production methods: knitted, woven and non-woven. This made it possible to compare and look for synergies between the cases. The construction change was from a cotton and polyester mix to the use of recycled polyester for the knitted and woven case. For the non-woven case, the change was from stitchbond polyester to spunbond polypropylene.

The result was a large reduction in greenhouse gas emissions for each of the cases. The comparison was for one square meter from raw material to finished textile. The comparison under these circumstances indicates a reduction with a about a third of the emission compared to the old constructions. The largest improvement potentials were identified as renewable energy for the knitted and woven textiles and alternative fibres for the non-woven case.

The approach used in the study can be used by others aiming to address and calculate supply chain GHG emissions. The models were build using secondary datasets from Ecoinvent and adapting this with primary data collected from suppliers. This was considered a good method to decrease complexity while still making the models more case specific. A lack of textile LCA data was identified through the study. Some of the data not found includes data for non-woven technologies, dope dyeing and different ways of filament spinning. Most of the previous studies and data also seem to focus on textiles for clothing. As the textile industry emits a lot of emissions, development of textile data and datasets is encouraged. Hopefully, more and more companies will calculate and address their supply chain emissions as well as developing methods and data to do so.