Advancing Sustainability

Strategies for CO_2 Reduction in DB Schenker's Contract Logistics

Serhat Yilmaz

Research Description

Sustainability has become a key strategic objective in logistics. Growing regulatory pressures and increasing customer expectations are driving logistics companies to adopt more sustainable operational practices. However, these initiatives often involve trade-offs, as they may require significant investments or affect operational efficiency. This study focuses on evaluating sustainability initiatives that reduce CO_2 emissions while maintaining operational efficiency across DB Schenker's Contract Logistics sites.

Methodology

A multi-method research approach was applied to identify and assess sustainability initiatives relevant to DB Schenker's Contract Logistics operations. The process began with a literature review that classified initiatives in an effort–impact matrix based on literature findings. This was followed by a stakeholder survey across multiple DB Schenker sites to validate their practical feasibility. Based on this assessment, four initiatives were selected for detailed analysis: MHE battery charging optimization, LED lighting, smart lighting systems (SLS), and solar photovoltaic (PV) installations as a complementary analysis. Each initiative was modeled or simulated to quantify its impact on energy consumption, CO_2 emissions, operational efficiency, and costs.

Results

The analyses showed that all four initiatives achieved notable reductions in energy consumption and CO_2 emissions without negatively affecting operational efficiency. Figure 1 visualises the CO_2 emissions per initiative, scenario, and site. The combination of optimized MHE battery charging and SLS reduced total energy use by 59% (178,447 kWh; 58,531 kg CO_2), equivalent to the annual electricity consumption of about 20 Dutch households. Among these, lighting-related initiatives contributed the largest share of savings, while optimizing MHE charging improved battery health next to the energy reductions. As a result, the overall energy reduction also led to significantly lower required solar photovoltaic investment costs. Overall, the study showed that substantial sustainability gains can be achieved without compromising operational performance.

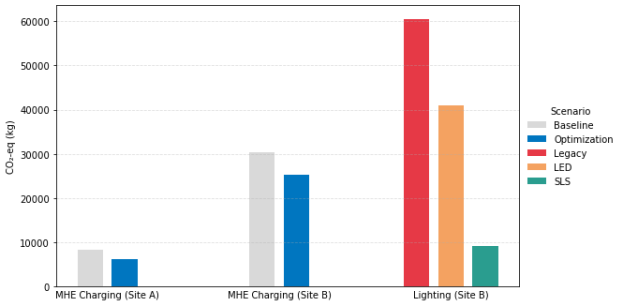

Figure 1: CO_2 Emissions per Initiative and Scenario.

Conclusion

The study showed that targeted sustainability initiatives can significantly reduce CO_2 emissions in contract logistics without affecting operational efficiency. Lighting-related initiatives delivered the largest impact, while optimized MHE charging improved both energy efficiency and battery health. The resulting energy savings also lowered solar PV investment needs. Therefore, implementing smart lighting systems and optimizing MHE battery charging is recommended for DB Schenker's contract logistics sites to achieve environmental gains and lower investment costs for solar PV installations.