Supply Chain Decarbonisation – A Cost-Based Decision Support Model in Slow Steaming Maritime Operations

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Abstract : CO2 emissions from maritime transport operations represent a substantial part of the total greenhouse gas emission. Vessels are designed with better energy efficiency. Minimizing CO2 emission in maritime operations plays an important role in supply chain decarbonisation. This paper reviews the initiatives on slow steaming operations towards the reduction of carbon emission. It investigates the relationship and impact among slow steaming cost reduction, carbon emission reduction, and shipment delay. A scenario-based cost-driven decision support model is developed to facilitate the selection of the optimal slow steaming options, considering the cost on bunker fuel consumption, available speed, carbon emission, and shipment delay. The incorporation of the social cost of cargo is reviewed and suggested. Additional measures on the effect of vessels sizes, routing, and type of fuels towards decarbonisation are discussed.