University of Strathclyde Glasgow

Reverse supply chain design optimisation

While striving for a more circular economy, the significance of efficient and effective reverse supply chain networks is crucial.

Their performance can largely determine the profitability and environmental benefit of the whole system, therefore ultimately affecting decisions on implementing these networks. In many cases the cost of implementing the reverse supply chain is the main prohibitive factor to more sustainable, circular economy approaches in many sectors. Due to the fact that reverse supply chain performance is mostly affected by local conditions, a one-fits-all approach is not suitable.

Dr. Athanasios Rentizelas has developed a series of customisable models of reverse supply chain optimisation at a strategic design level, providing optimum solutions for the capacity and facility location decisions. Optimising the design of a reverse supply chain can lead to cost reduction and reduced environmental impact of the network.

The models developed have been applied in several instances for the biomass- and waste-to-energy reverse supply chains with excellent results, improving significantly the profitability and the environmental performance of the systems examined. We are currently working on further applications of the models in the agricultural plastics waste-to-value added products, ICT equipment remanufacturing and glass and carbon fibre reinforced plastics remanufacturing sectors.

What are the outcomes?

The optimisation models can act as a decision-support tool on the optimum location and capacity of the required processing or other facilities of the reverse supply chain, as well as providing an assessment of the economic and environmental performance of the solutions proposed. They can also assist in the process of selection of the supply sources for operational cost minimisation, when relevant. The models can further serve to investigate 'what if' scenarios examining different logistical options available in terms of cost and environmental impact.

How are we applying it?

The method is being applied through various instruments in different sectors. Please get in touch with us to discuss your own case and requirements.

Contact

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