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Economical optimisation of land use aspects of recycling networks

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Strategies for environmental protection and recycling of used appliances, industrial and communal wastes are helpful in order to create a closed loop economy. This contribution addresses the economic valuation of technical and organisational measures and their optimisation in a technical and economic sense but also in respect to other factors like logistics of networked recycling enterprises. The authors describe a mathematical model for describing the available resources of potential members of virtual recycling enterprises.

The following objective and subjective factors were taken into account in developing the mathematical model supporting the resource selection process of a virtual recycling enterprise. Objective factors: resources of the partner enterprise (equipment, machinery, warehouse, services, etc.); its capacities in a given period, their disposability, costs of capacity insurance; capacity scalability; indicators of the use of resources; networking history; quality assurance system; the amount of complaints; capital intensity; guarantee; insurances; the standardisation of the product and service; market share, strategic position; the size of the enterprise; etc. Subjective factors: cultural and language environment; political environment; references; quality of performance previously; agility; reliability; capability and willingness of cooperation; innovativeness; etc. model described in the previous section, a software implementation based on a genetic algorithm was prepared.

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