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## Editorial

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**Biographical notes:** Professor Dr. Axel Tuma studied Industrial Engineering at the Technical University of Karlsruhe. His PhD thesis addressed the 'Use of Artificial Intelligence for the Coordination of Energy and Material Flows'. Professor Tuma holds the Chair of Production and Environmental Management at the University of Augsburg since 2001. His areas of research are sustainable supply chain management, reverse logistics and environment-oriented production control.

Peter Letmathe studied Business Administration at Bielefeld University. He received his PhD from Essen University. His books and articles cover different areas in the fields of environmental and operations management. He has been the head of the GOR Workgroup 'Operations Research and Environmental Management' since 2000. After holding positions at Ruhr-University Bochum, Clemson University and Bayreuth University, he now holds the Chair of Corporate Environmental Management at Siegen University.

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## 1 Introduction

The idea for this special issue was born from a workshop of the working group 'Operations Research and Environment' of the German Society of Operation Research. The title of the workshop, which took place in November 2002 at the University of Augsburg / Germany, was Sustainable Supply Chain Management and Reverse Logistics.

The management of closed loop supply chains and reverse logistics is becoming increasingly important. The reasons for this are twofold: on the one hand, the European environmental legislation tries to persuade OEMs to close their supply chain by explicitly encouraging the reintegration of used materials. Therefore, the OEMs face the challenge to determine which recovery alternative they should choose to minimise their disposal and recycling costs. On the other hand, used parts both from recalled and end-of-life products have already been, in a range of cases, successfully refurbished and reused without any legislative obligation. Return flows are increasingly being considered as a profitable asset that has to be protected, and is not regarded as a burden anymore. While

dealing with this subject, however, it is necessary to use analytical methods in order to cope with its complexity and to substantiate the ongoing environmental debate with hard facts instead of preconceived ideas.

A prerequisite for a successful management of closed loop supply chains is an accurate analysis and modelling of the energy and material flows, as one of the papers presented here makes clear. Subsequently, current planning and controlling algorithms have to be reinvented. In this context, two papers deal with the integration of disassembly planning in ERP-Systems and the design of control systems for component recovery and spare parts management. On a strategic level, integrated transport and storage capacity linked with reliable investment-planning are decisive factors for establishing a profitable supply network. In this context, a paper focuses on the cooperation between waste producers and disposal enterprises. Beside the planning and controlling of a supply network's logistic processes, environmentally integrated production techniques are crucial for the realisation of a sustainable supply chain management. An example from the metal surface treatment illustrates this point.

We hope that the published papers of the workshop will help to promote further research of sustainable supply chain management and reverse logistics.