2 Aspects of Material Flow Management

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The term material flow management covers a broad spectrum of methods and approaches in the literature. In general, material flow management refers to the analysis and specific optimisation of material and energy flows that arise during the manufacturing of products and provision of services. Material flow management can focus on very different levels of consideration. When defining system borders for material flow management, the following areas can be specified:\(^1\)

- Company-internal processes
- An entire company
- Supplier relationships along a value-added chain
- An entire value-added chain
- A region
- A nation.

This flexibility with respect to system borders leads us to another key topic of material flow management: the management of material flows. This extends beyond a merely material or technical aspect the focus lies on a system to be optimised, not an individual product or material.\(^2\) The approach in such a systematic analysis of material flow management is the interlinking of a purely technical-economic approach (corporate input-output optimisation) with an ecological value (system) in regards to sustainability and future potentials. Successful material flow management thus also links the structural analysis of material flows with the data

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\(^2\) See Marsmann 1998, p. 10
available in business information systems. A direct quantification of the quantity/ volume and costs of material flows points out the way towards new cost-cutting options. Consequently, material flow management is first and foremost characterised by interdisciplinarity and networking on the basis of a normative orientation. In addition to a clarification of the term, aspects of material flow management also comprise the consideration and examination of stakeholders and networks as well as the various forms of material flow management.

2.1 The Term "Material Flow Management"

In its demand for a material flow management of all material systems, the "Protection of Mankind and the Environment" Commission of Inquiry of the 12th Deutsche Bundestag (Lower House of the German Parliament) presented a quantitative and qualitative new challenge for governments, companies, science and research. At the same time, the Commission of Inquiry also provided a basic definition of the term "material flow management" from a macroeconomic standpoint:

"Management of material flows by the involved stakeholders refers to the objective-oriented, responsible, integrated and efficient controlling of material systems, with the objectives arising from both the economic and ecological sector and with the inclusion of social aspects. The objectives are determined on a company level, within the scope of the chain in which stakeholders are involved or on a national level."

Additional publications have concretised and supplemented the Commission of Inquiry's definition, e.g. by differentiating between internal and cross-company material flow management. Whereas an internal material flow refers to the movements of substances or materials within a company, a cross-company (external) material flow describes the path of a material along the value-added chain. The path of cross-company material flow management is also described as the product line or product lifecycle, from the input of raw materials, manufacturing, distribution and use and consumption up to disposal. Sterr defines material flow management as a "objective-oriented, structured handling of materials along the value-added

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3 See Enzler/ Krcmar/ Pfenning/ Scheide/ Strobel 2005, pp.63 et seq.
4 See Brickwedde 1999, p. 13
5 Enquete-Kommission (Commission of Inquiry) 1994, pp. 549 et seq.
6 See Staudt et.al. 2000, p. 6
7 See Zundel et.al. 1998, p. 319