Metallic Raw Material Flows – from analysis towards decision support

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Metallic raw material flows interfere with a large number of sustainability issues. Stakeholders including industry, politics, NGO's or society are integrated in the discussion to promote the "highest" potential. To support this mediation process a scientific instrument has been developed to supply information on complex metal flow systems. This integrated resource management system is a set of tools which are designed to point out existing potentials and to estimate resulting ecological, economical and social effects of various actions. Widening the LCA concept towards economic and social aspects two basic models have been developed. While technical linking is the main aspect of a process chain model (ProcAl), a partial equilibrium model (GlobAl) focuses on economic aspects. In addition to technical and economical aspects, environmental factors based on the existing methods of the Life Cycle Impact Assessment (LCIA) are integrated into the analysis.
Beside the description of the present situation scenarios show possible future developments and their effects on material and energy flows, plant locations and resource productivity. Technically orientated analyses show the overall medium or long term effects of technical progress, identify specific potentials and simulate optimised recycling systems. Additional studies include economical mechanisms into the material flow analysis considering changes in demand or legal frameworks. Ecological investigations take into account different environmental conditions at plant locations. The monetarisation of external effects allows the use of life cycle costing approach and opens the economic line to social aspects. By combining these facets within a harmonised framework actors and stakeholders can be addressed to elaborate decisions towards a sustainable development of specific material flows.