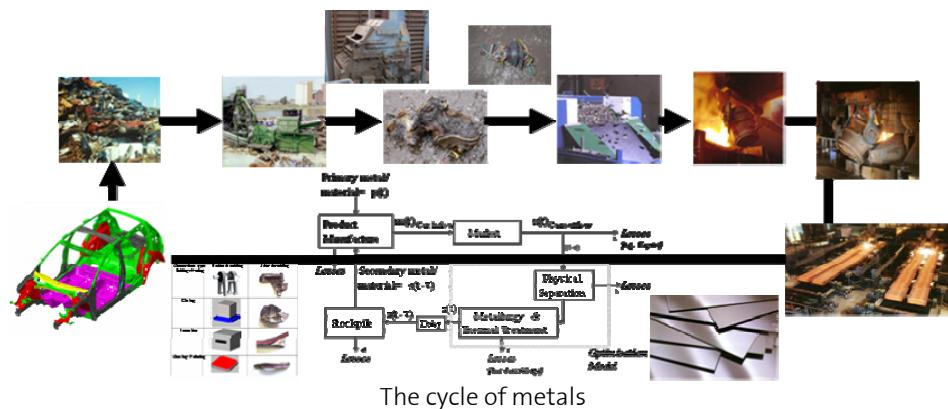


## Ecology of the Metal Cycle

Metals and Materials are used in a wide range of products and applications ranging from consumer products (cars, electronics, white and brown goods, etc.) to constructions (buildings, roads) and agriculture (fertilisers) etc. The social, economic and ecological value of the materials in these applications is not only determined by the 'in-use value' of these applications such as functionality, durability, safety, reduced energy consumption, aesthetics, etc. but also by the possibility of these materials to return from their original application into the resource cycle after their functional use at the lowest environmental and social impact. The design of the product determines the selection of materials to be applied in the products as well as the complexity of the material combinations and interactions within this product (e.g. welded, glued, alloyed, layered). These actions directly affect the recyclability of the materials and metals i.e. whether the material cycle can be closed and whether one can speak of an Industrial Ecological system.



This session will deal with all aspects of the environmental impact of metals within the cycle shown in the figure above. Topics (not exclusive) that will be covered are:

- System modelling of the metal cycle, both steady state and dynamic
- Studies on the effect of legislations or incentive systems on product design and recycling quota
- Next generation LCA tools for complex interlinked metal flow systems
- Metal product stewardship
- Impact of metal-matrix-composites (MMC) and other new materials on the metal cycle
- Real-time environmental control of metallurgical operations/reactors
- LCA case studies from metallurgical and metal processing industry involving metal processing, extractive metallurgy, production, manufacturing etc.
- Link of product design to recycling and metal recovery on a first principles basis so that the models can be linked to computer aided design tools to predict recyclability
- Studies on the effect of changing product composition on recycle metal production
- The effect of minor alloying elements, minor elements in products and minor elements from ore production on the ecology of metals – predicting environmental impacts

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