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Material flow reductions in the automotive value chain: Conflicting and complementary incentives

Dr. Tillmann Blume, Universität Kassel, Germany

Dr. Michael Walther, Universität Kassel, Germany

The reduction of material flows – with the ultimate aim of a circular flow economy – is a central aspect of a sustainable development. Options for a reuse of parts and components or alternatively their material recycling are mostly defined during the initial product design. In the automotive industry, the End-of-life Vehicle Ordinance as a legal norm confronts the Original Equipment Manufacturers (OEMs) with their end-of-life products and entrusts them with the disposal and the fulfilment of recycling quotas. It aims at reduced material flows via a sustainability-oriented product design. Rising raw material prices simultaneously provide monetary incentives for a reuse and recycling. However, these incentives for sustainability-oriented innovation processes are being superimposed. The value chains in the automotive industry retain their hierarchical character and a closer cooperation with up- and downstream levels, which is essential for innovations towards a design for recycling, is in conflict with the power-political strategic aim of maintaining the dominant status. In addition, technological improvements in post-shredder-treatment suffice to – at least currently – fulfil the recycling quotas. Finally, the – partly illegal – export of end-of-life vehicles into secondary value chains, especially to Africa, also shifts the problem away from the direct sphere of influence of the OEMs. The example of the automotive industry thus serves to illustrate the conflicting incentives that exist within companies and how both legal and market incentives can be superimposed by other aspects. Therefore, it firstly has to be analysed how stakeholders, especially political decision-makers and customers, can exercise increased pressure. Secondly, it must be considered how framework conditions on the markets have to change or how companies can actively influence them to secure resources and open up new potentials. Currently, the End-of-life Vehicle Ordinance generates only very limited impulses for innovation. With regard to end-of-life vehicle disposal the OEMs focus almost exclusively on a design-for-pretreatment and otherwise hand down their product responsibility to the disposal companies. However, the substantial increase of the recycling quotas planned in the End-of-life Vehicle Ordinance for 2015 could generate a significant new stimulus for sustainability-oriented innovation activities in the automotive industry.