Regulatory Impact Assessment from a company's perspective

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Due to environmental problems such as widely acknowledged man-made global warming, governments in OECD have set ambitious goals to reduce emissions. Especially the automobile industry has been in the focus of these new regulations. For a car manufacturer the question arises what consequences these new regulations may have concerning model policy and technology development. In the past, the majority of customers did not purchase eco-friendly cars but opted for large ones like Sports Utility Vehicles. It seems to be difficult to fulfill both customers' preferences and governmental regulations. Therefore, the goal of this contribution is to assess how a manufacturer should cope with this situation in the long term.

Regarding this situation we find a highly complex and dynamic environment with many uncertainties. Therefore, we propose a simulation model to analyze the situation and possible future developments. From a methodological point of view, System Dynamics seems to be a suitable framework. It was developed at MIT in the 1960s and has since then been used successfully in many cases of strategic decision making in complex dynamic systems. Thereby, at first sight some developments seem not to be influenced by the decision maker, but more detailed analyses show that they are in fact indirectly related to decisions made some time ago.

Most approaches in the past dealing with technology transition in the automotive industry focused only on customer demand to analyze transition scenarios. We propose a model displaying the interaction of manufacturers and customers. Image 1 shows the main information and material flows. Two main feedback loops can be discovered. Customers base their decision which technology to buy on available information about which products manufacturers offer and the experience with cars presently in use they have. The decision of the customer then determines which kind of car is added to the car stock (the car fleet on the road) over time. A car manufacturer decides which technology to offer on the one hand on the basis of past purchasing decisions and on the other hand on which technology innovations could be successful. Furthermore, governmental regulations have to be fulfilled to be allowed to sell a product. Based on what has to be fulfilled and what could be successful in the market, technologies are developed, improved or removed from the production program.

The paper aims to assess different scenarios of changing drive train technologies, in order to develop strategies for a manufacturer to meet emissions regulations without losing market shares.

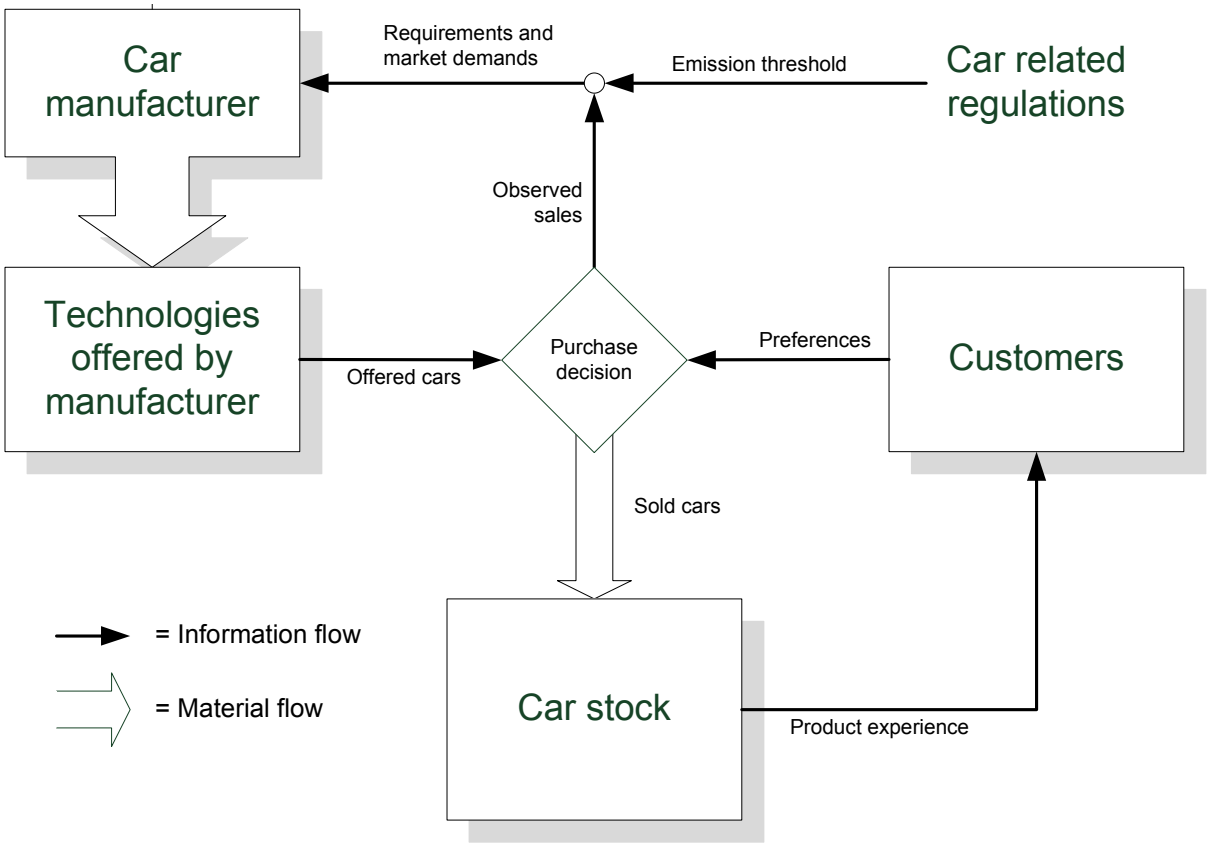

Image 1: Structure of the simulation model