

Life Cycle Assessment: Case Study of Steel in Brazilian Automobiles**C.M.L Ugaya**CEFET-PR, cassia@cefetpr.br;**A.C.S Walter**Unicamp, awalter@fem.unicamp.br

The objective of this study is to identify the main pollutant emissions due to the utilization of steel in Brazilian automobiles. Therefore it was performed Life Cycle Assessment (LCA). LCA takes into account all the life cycle of a product, that is, from its extraction till its disposition.

In order to perform this evaluation, the life cycle of the automobile was limited into three phases: materials manufacturing, automobile usage and discard. It was considered an automobile of 1.300 kg. Steel was chosen due to its high proportion in an automobile in weight terms. Besides, Brazilian automobile industry consumed 1.999 thousands of tons in 2001, which accounted for 12,7% of the steel national production. Steel represents 878 kg of an automobile, considering that it is 67,5% of the automobiles weight. Nevertheless, the functional unit was 263 kg, which represents 30% of the steel, due to the possibility of exchanging it for another material.

Collected data of resources (iron ore, clay, scrap and water) and energy consumption (mineral coal, vegetable coal, electricity, gasoline, alcohol) , air pollutants (NH_3 , CO_2 , CO , NO_x , HC , SO_x , MnO , SiO_2 , P_2O_5 , HCN , HCl , Pb and particulate matter) and solid residues production were from year 2000. Whenever possible, lack of data was fulfilled with estimations and the data was stored in worksheets. Sensibility analysis was performed for each life cycle stage.

Main results showed that the automobile utilization and the materials manufacturing were responsible for most of the energy and resources consumption. The solid residues production occurs mainly in the discard, due to the low recycling level in the country. Sensibility analysis showed that the most important phase of the life cycle was the automobile usage, except for CO , SO_x , particulate matter and solid residues production.