

Sustainable Product Development

Benchmarking chairs made of Wood, Plastic and Aluminum

(Guidelines for Designers and Manufacturers)

EVA HAVIAROVA

ZUZANA TONCIKOVA

EHSAN VAHIDY

SPRING 2016



COMPARING ENVIRONMENTAL IMPACT OF PRODUCTS

Chairs made of single material BUT by different manufacturing processes.



Cyclic Load - 420Lb
Life - 20 years



Cyclic Load - 80Lb
Life - 4 years



Cyclic Load - 150Lb
Life - 6.4 years

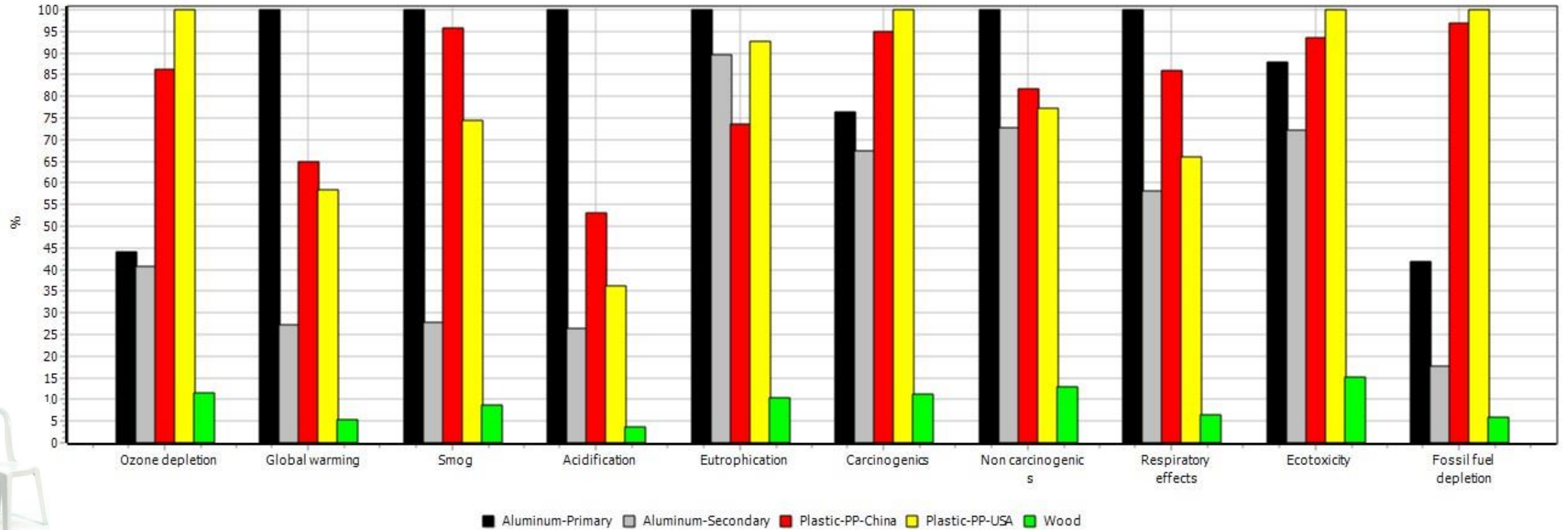
CHAIRS

1. Wood
2. Plastic
3. Aluminum

Functional Unit:

20 Years

LCA on PRODUCTION of CHAIRS (aluminum primary, alum. secondary, plastic China, plastic US, and wood).



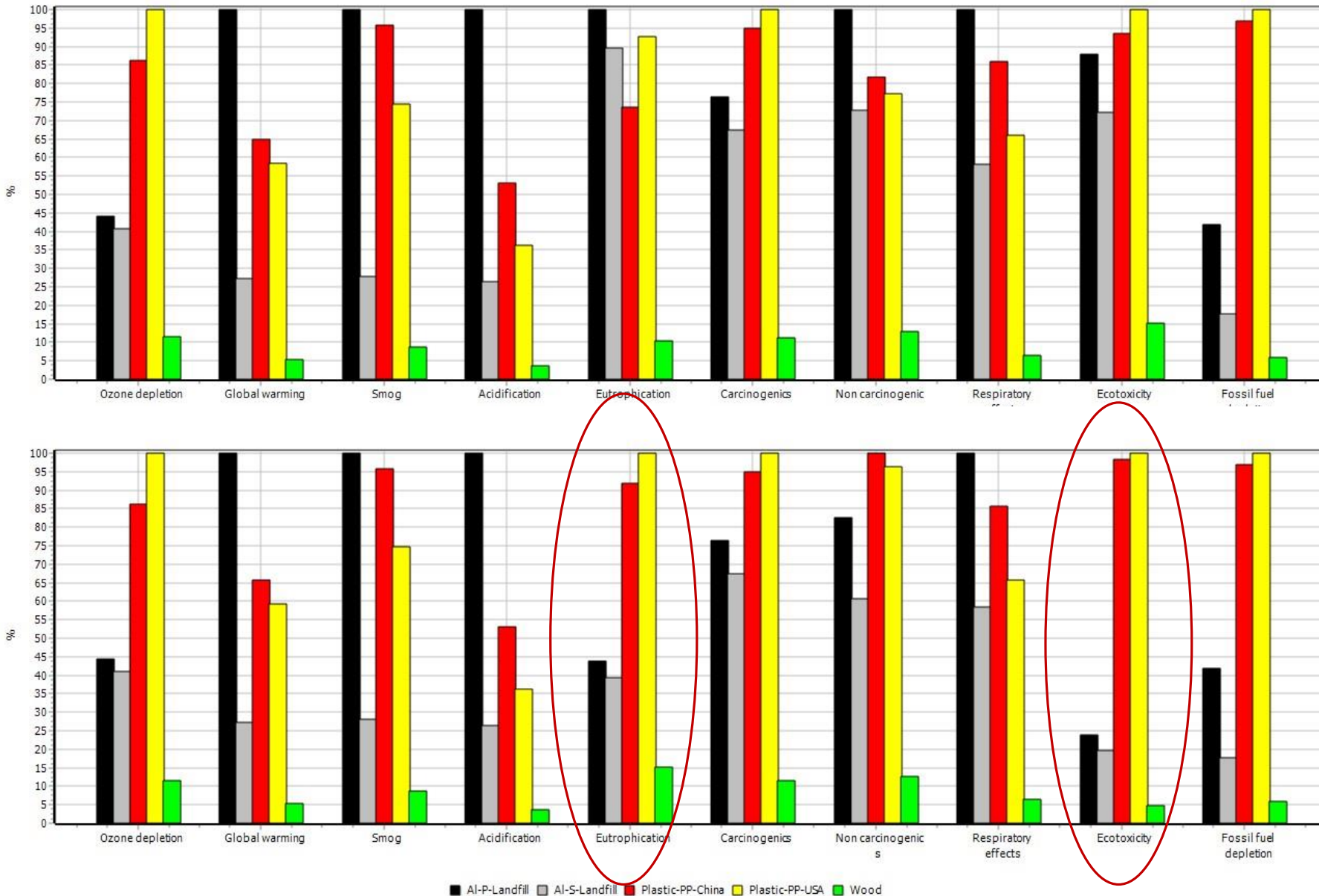
Method: TRACI 2.1 V1.02 / US 2008 / Characterization
Comparing product stages;



Environmental performance of wooden chair is superior to chairs made of other materials. Increased environmental footprint of wooden chair is caused by finishes and transportation.

SimaPro; Method: TRACI 2.1 V1.02/US 2008/ Characterization; Comparing product stages

LCA on **PRODUCTION** and **LANDFILL** of CHAIRS (aluminum primary, alum. secondary, plastic China, plastic US and wood).



Landfill was added to the production process.

The only significant changes detected in environmental performance were in Eutrophication and Ecotoxicity for aluminum.

Recycling plastic in general is not feasible. Aluminum recycling will be showed later.