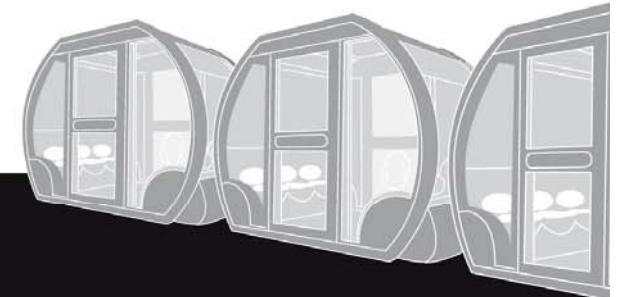




Materials and architecture to lighten the EV

The E-Light Project



Cluster Pôle Véhicule du Futur®
Solutions for future vehicles & mobility

International Encounters

Mobilis 2011

Belfort - France

15th and 16th november

www.mobilisconference.com

Lightweight → The E-Light Project

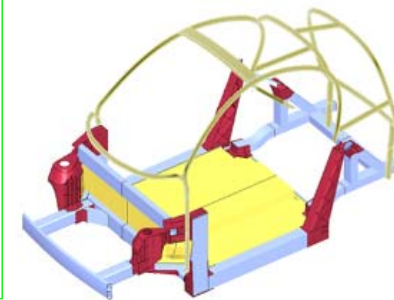
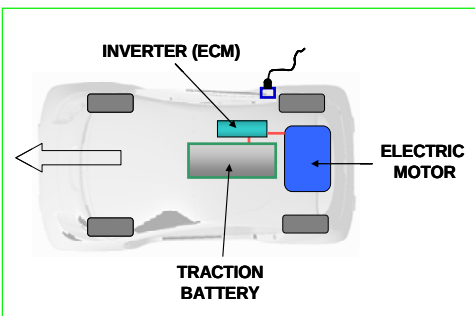
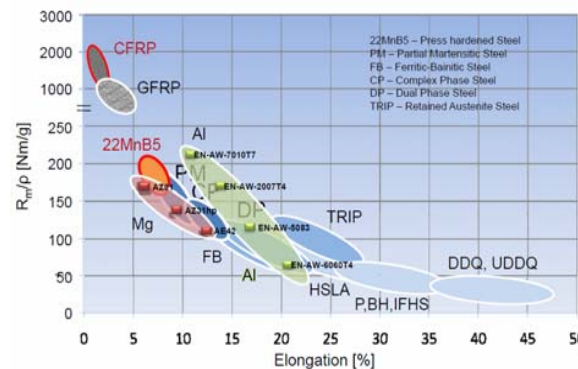
Focus:

The project aims at exploring all the aspects and requirements for optimal electric vehicle architectures, focussing on:

- Modularity of components
- Ergonomic designs
- Innovative safety concepts
- Lesser weight → decrease consumption → increase range.

Research Topics:

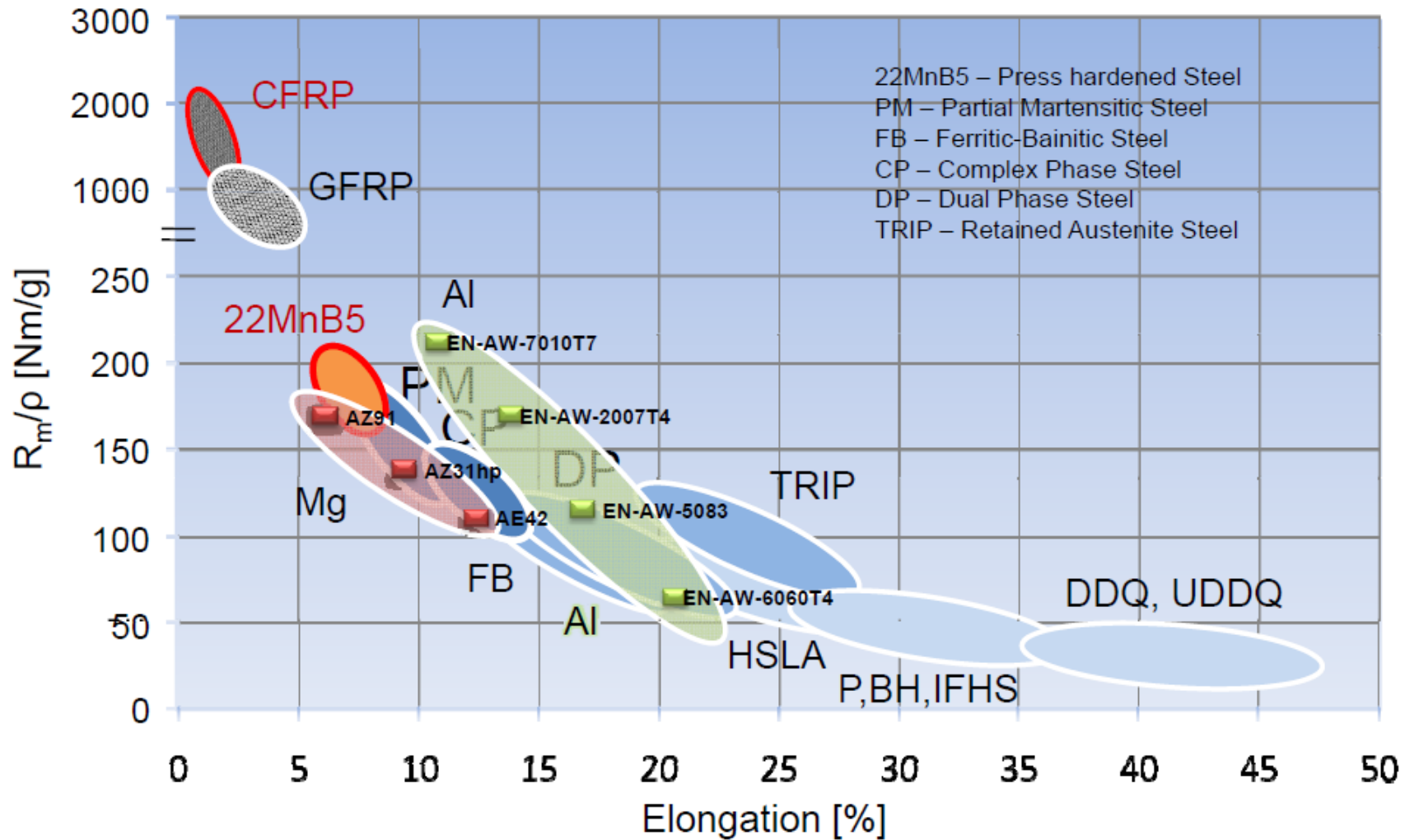
- Innovative multi-material modular architecture specifically designed for urban EV
- Optimal multi-materials solution including suitable and feasible joining techniques and manufacturing processes.
- Analysis of the optimal geometries and designs (structural, safety and NVH)
- Definition of design methodology and testing procedures toward more sustainable, lightweight, modular concepts



Lightweight → Materials

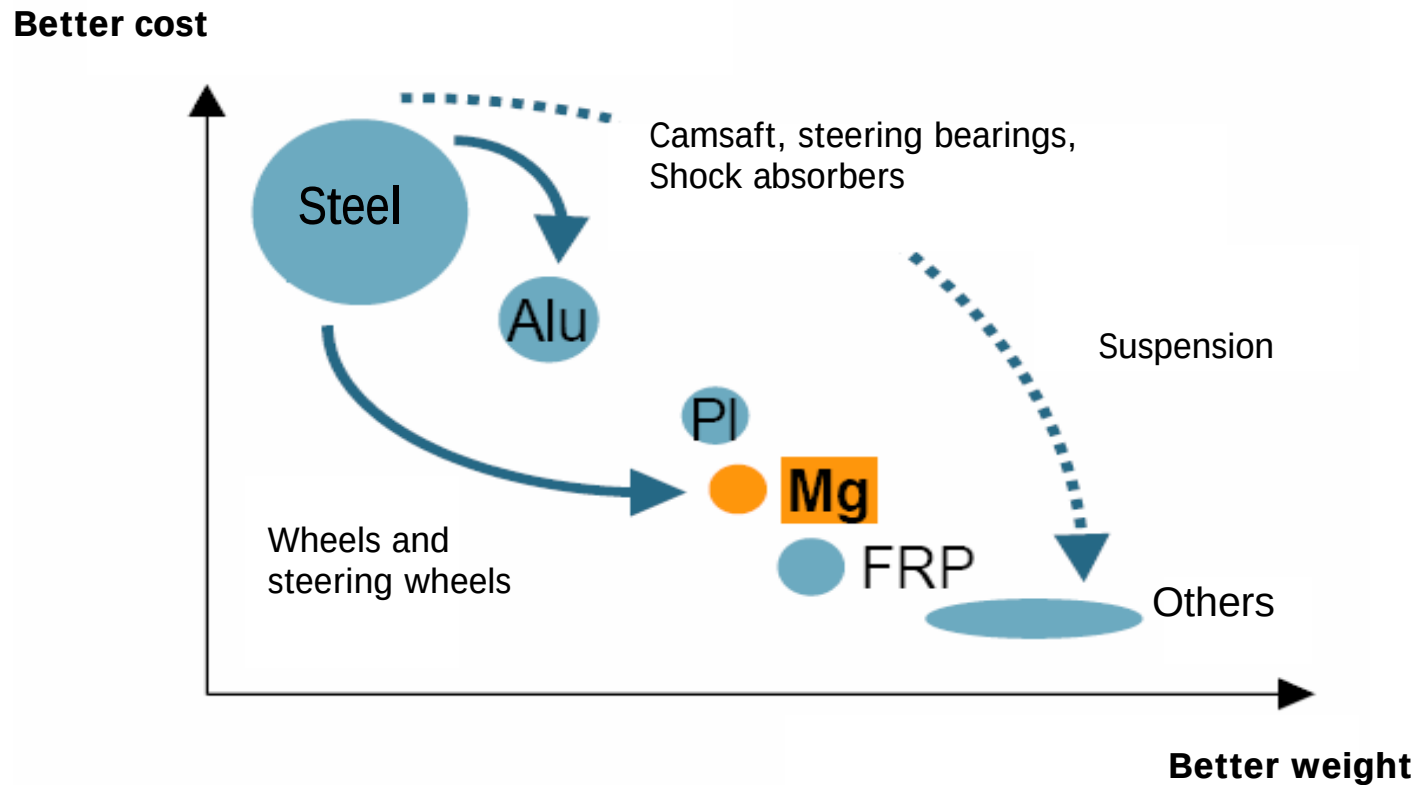
- ✚ EV range to be increased by decreasing the weight:
 - ✚ There is a new cost-benefit ratio
 - ✚ New materials and materials from other industries
- ✚ In order to replace a component the material, the manufacturing process and the assembly are key issues to be considered.
- ✚ E-Light focus on AHSS, light alloys and reinforced composites
 - ✚ Depending on the component requirements and loads
 - ✚ Depending on the manufacturing process
 - ✚ Depending on the joining and assembly

Lightweight → Materials



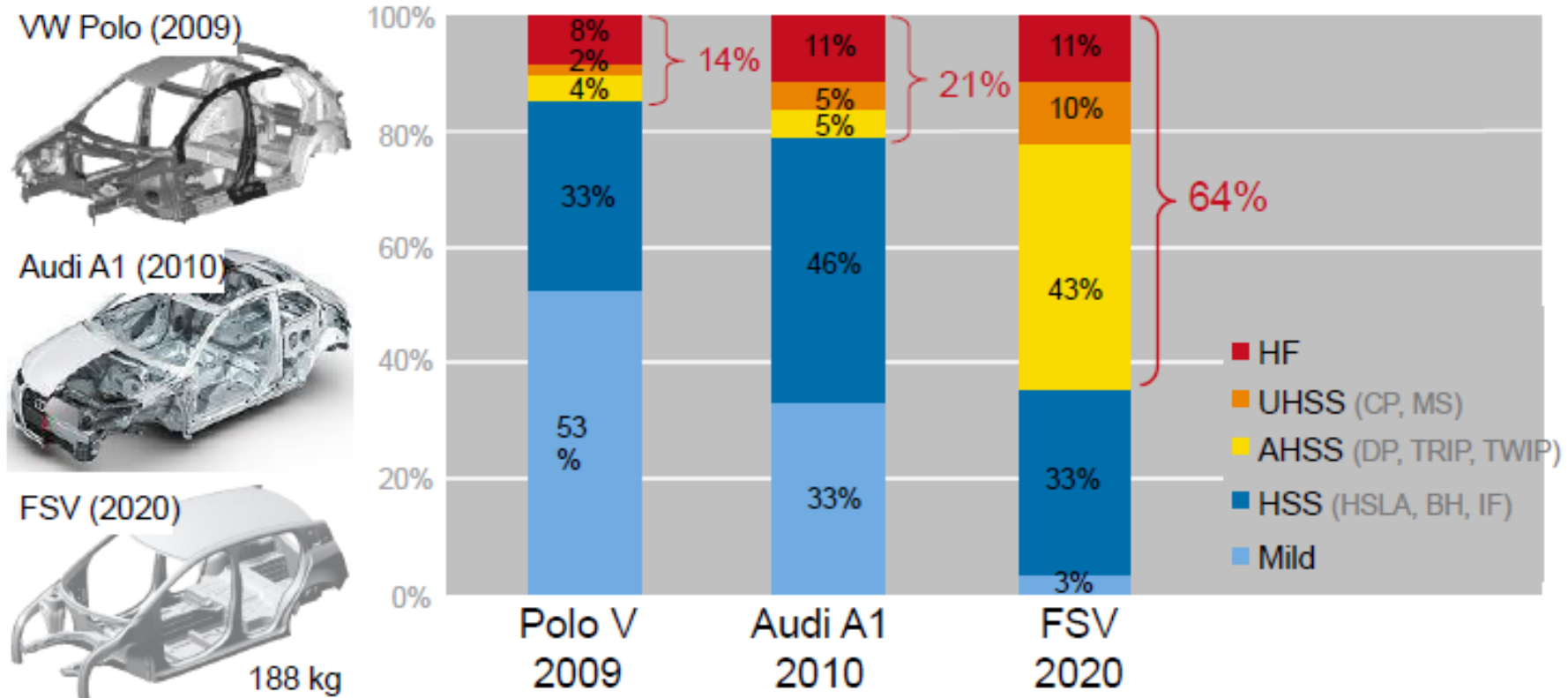
Lightweight → Trends

Trends in chassis



	Steel	Alu	Plastics	Mg
2000	57%	12%	6%	0%
2010	51%	16%	7%	1%

Lightweight → Steel

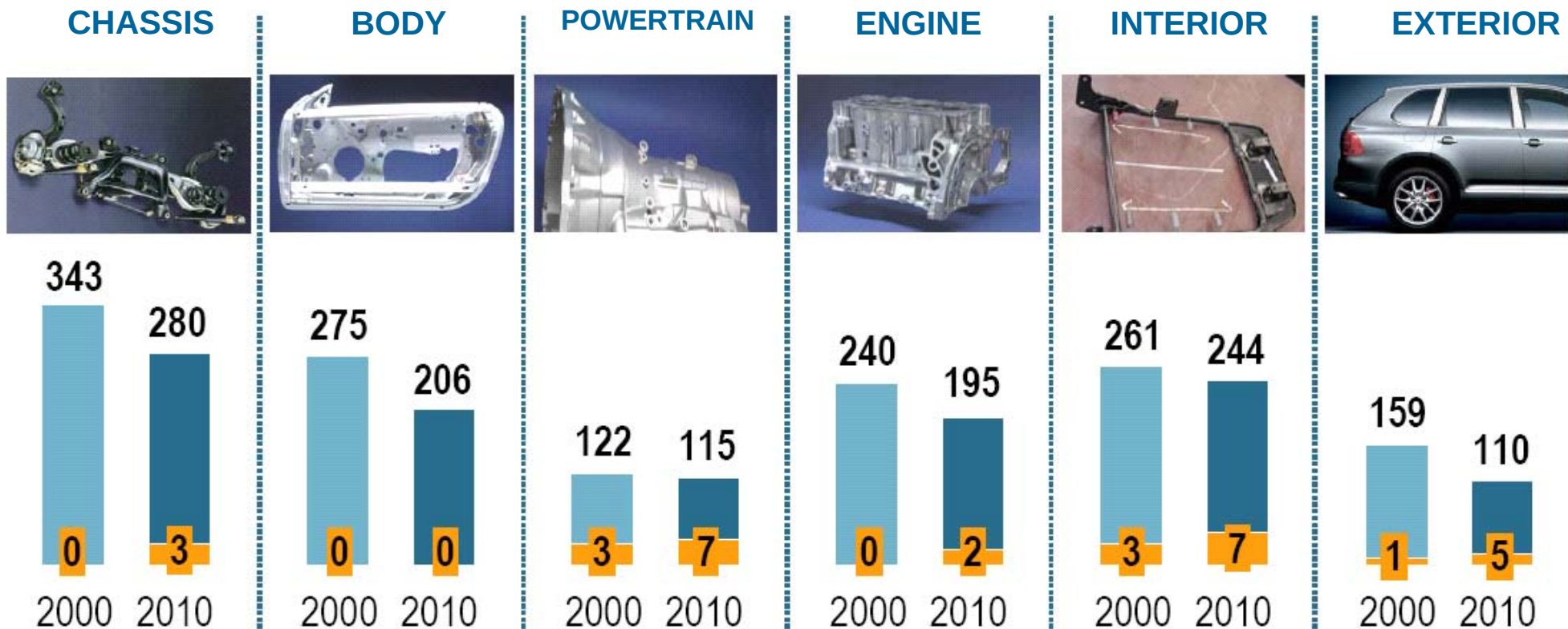


► Significant increasing share of AHSS, UHSS and hot forming steels

Source: Eurocarbody 2009
ATZ extra 06/2010

Lightweight → Magnesium

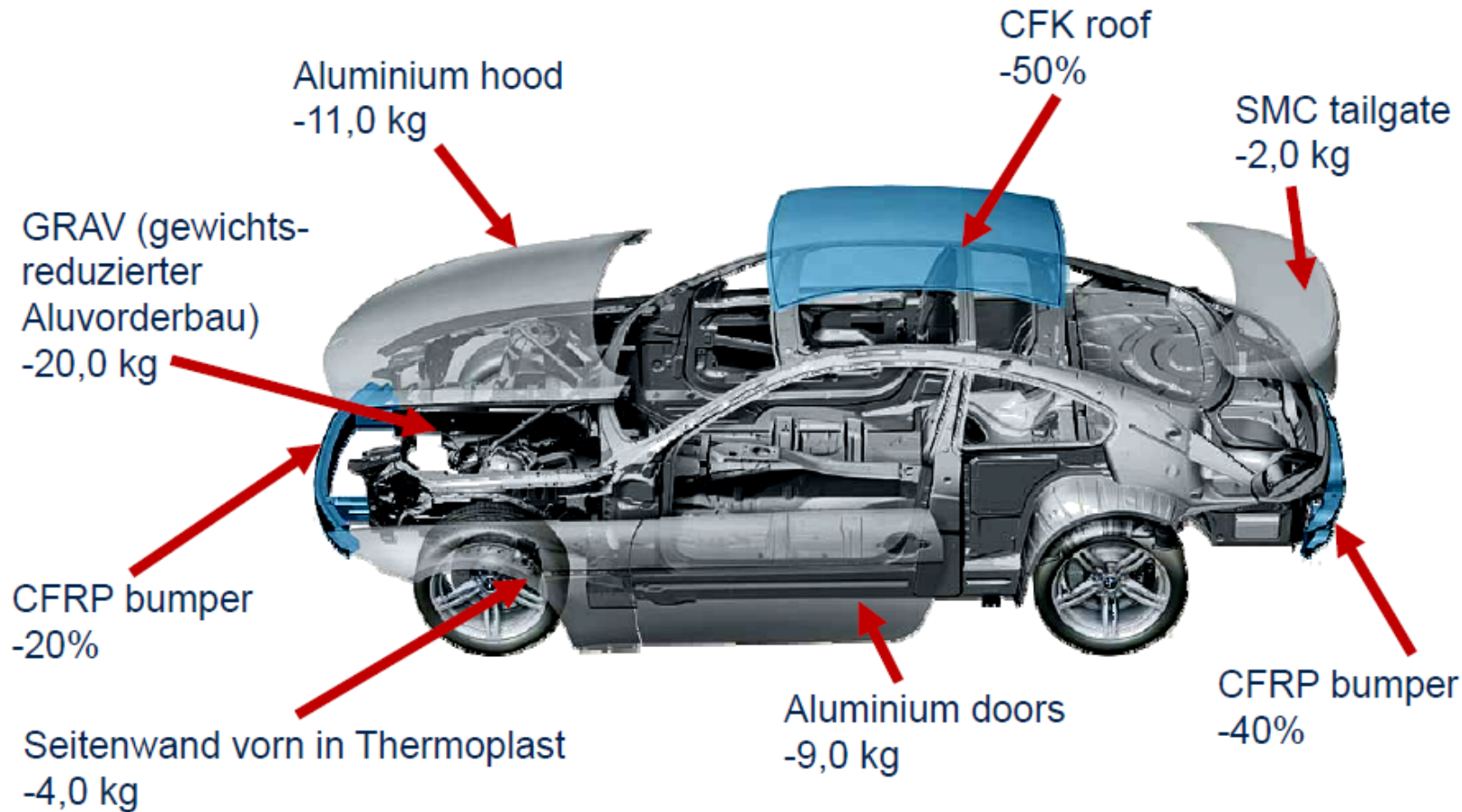
✦ Magnesium use for weight reduction



Number of magnesium components

Lightweight → multi-material approach

Multi-Material-Design: BMW M6, weight savings



Weight savings due to material mix

Lightweight → Design loop

