

Data entry - Bus

1 Specification of the vehicle

Initial mass of vehicle - before ligh-weighing (kg)	11500
Energy consumption of vehicle per 100 km	
Litres Diesel	40
Percentage biofuel in gasoline or diesel	0%
primary energy for biofuel in MJ/l	20.1
life cycle GHG emissions for biofuel in kgCO2/l	1.46
Nm3 natural gas or LPG	0
Mass sensitive fuel consumption (%)	85%
Fuel savings (liter/100km/100kg)	0.296
Life time driving distance (km)	1,500,000

2 Specification of the Component

Component	Body&Chassis	
Mass of component (kg)	Aluminium 3005	Steel 4830
Portion of the component (%)		
...gained from aluminium sheet w/o continous heat treatment	0%	
...gained from aluminium sheet with continous heat treatment	33%	
...gained from extruded aluminium	67%	
...gained from forgings	0%	0%
...gained from castings	0%	0%
...produced from untreated flat mild steel		30%
...produced from hot-dip galvanized flat mild steel		0%
...produced from untreated long and special steel		70%
...produced from hot-dip galvanized long and special steel		0%
Percentage of indirect mass savings (%)	23%	

3 Production stage

Percentage of generated process scrap from forming and machining	20%	50%
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4 Recycled content of final component

Recycled content	Aluminium 50%	Steel 50%
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4 End-of-life stage

Recycling route	Aluminium Classical Shredding	Steel Classical Shredding
Total recycling rate	90%	90%

Results

1 Component information

Type of component	Body&Chassis	
Material option	Aluminium	Steel
Mass of the component (kg)	3005.00	4830.00
Mass difference (kg)		1825.00
Additional indirect savings		23%
Total mass savings aluminium vs. Steel (kg)		2244.75

2 Car information

Initial car mass - before light-weighting (kg)	11500
Life time driving distance (km)	1,500,000
Average fuel consumption (l/100km)	40
Average natural gas or LPG consumption (Nm ³ /100km)	0

Fraction of fuel consumption sensitive to the car mass (%)	85%
Fuel savings (litres/100km/100kg)	0.296

3 Recycling Information

Material option	Aluminium	Steel
Recycled content of component	50%	50%
End-of-life recycling rate of component	90%	90%
Credits for end-of-life recycling	40%	40%

4 Non-renewable primary energy for the full life cycle of the component (MJ)

	Aluminium	Steel	Indirect weight equivalent	Savings (incl. use stage)	Relative savings per kg Al (incl. use stage)
Primary metal supply	209,237	61,100	5,310	142,828	
Recycled metal supply	13,550	17,085	1,485	-5,020	
From ingot to finished product	73,984	55,631	2,617	15,736	
Use stage	NA	NA	NA	-4,004,876	-1,333
Total (cradle to gate)	296,771	133,816	9,411	-3,851,332	-1,282
Credits for end-of-life recycling	-156,648	-35,431	-3,079	-118,137	
Total (life cycle)	140,123	98,384	6,332	-3,969,469	-1,321

5 GHG emissions (carbon footprint) for the full life cycle of the component (kg CO₂-equiv.)

	Aluminium	Steel	Indirect weight equivalent	Savings (incl. use stage)	Relative savings per kg Al (incl. use stage)
Primary metal supply	15,543	4,881	424	10,238	
Recycled metal supply	906	1,066	93	-253	
From ingot to finished product	4,131	3,480	186	464	
Use stage	NA	NA	NA	-291,681	-97
Total (cradle to gate)	20,580	9,427	703	-281,231	-94
Credits for end-of-life recycling	-11,717	-3,071	-267	-8,379	
Total (life cycle)	8,863	6,356	436	-289,610	-96