

Knorr-Bremse Group

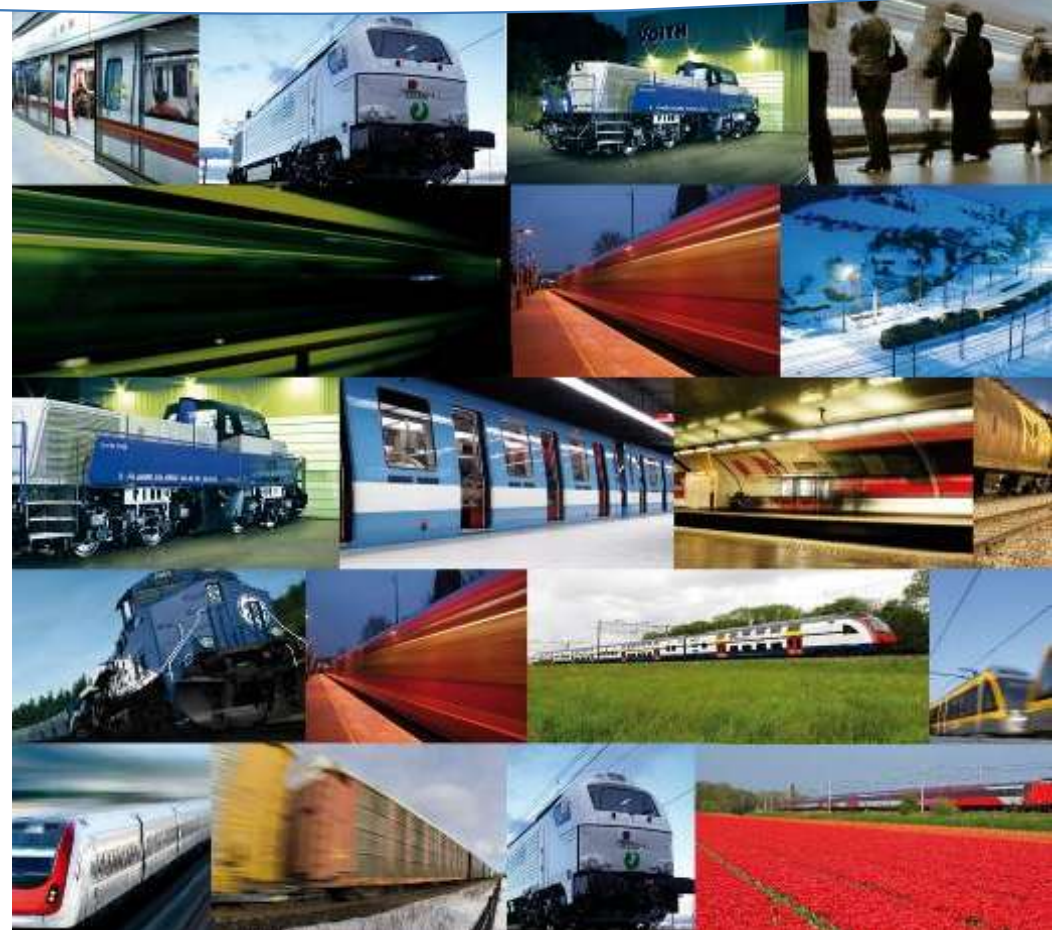
21 November 2018, Budapest



ecodesign. Innotrans 2018

LCA focus Product Carbon Footprint

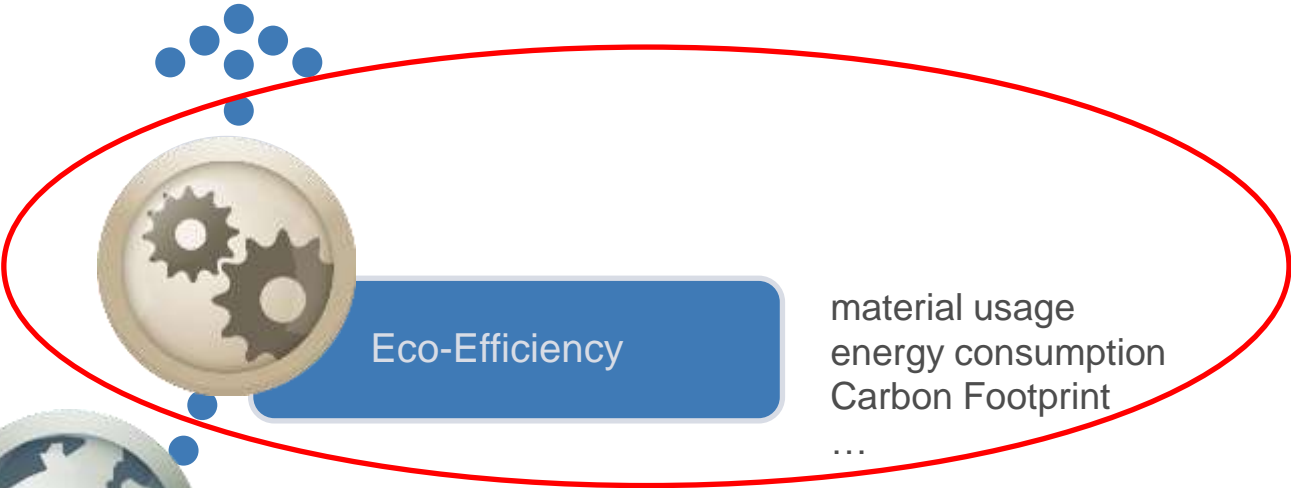
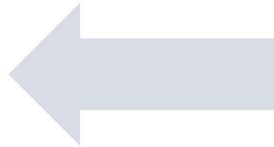
Monika Godó



Ecodesign Overview

Green Product

Tool to evaluate it:
LCA –
Life-**C**ycle **A**ssessment



Performance beyond legal aspects

RISL (UNIFE)
Noise below threshold
...



Legal Aspects

REACH
RoHS
F-Gas
...

KB ECODESIGN WALL at Innotrans 2018



LIFE-CYCLE ASSESSMENT (LCA) BY KNORR-BREMSE

WHAT IS A LIFE-CYCLE ASSESSMENT (LCA)?

- Standardized approach to determine environmental impacts
- Considers the entire life cycle of a product or service, from raw material extraction to end-of-life disposal
- Includes identification of environmental impacts, calculation of environmental impacts, and interpretation of results
- Provides a clear and concise overview of environmental impacts

METHODOLOGY

- ISO 14040 & ISO 14044
- EN 15804 (Product Environmental Footprint)

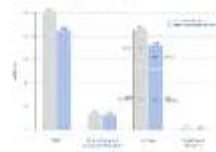
SCOPE

- Product, material, and process LCA

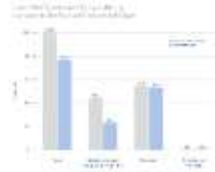
LIFE-CYCLE ASSESSMENT – FOCUS PRODUCT CARBON FOOTPRINT

For example in this selection:

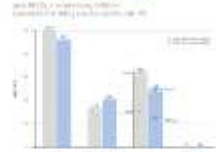
HEAVY-DUTY ELECTRO-HYDRAULIC LINE (TWO-DRIVE)



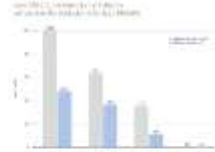
LIGHT-DUTY CALDER



GLOBAL PRODUCTION OF TWIN-DRIVE



GLOBAL PRODUCTION OF TWIN-DRIVE



LCA facts

LIFE-CYCLE ASSESSMENT (LCA) BY KNORR-BREMSE

WHAT IS A LIFE-CYCLE ASSESSMENT (LCA) ?

- Method to analyze, quantify and understand the environmental impacts
- Considers the entire life-cycle of a product from raw material extraction to use and end-of-life treatment / disposal
- Evaluates inputs, outputs and environmental impacts of a product throughout its life-cycle
- One part of LCA is the product carbon footprint analysis

METHODOLOGY

- According to ISO 14040 / 14044
- In accordance to UNIFE Product Category Rules

SCOPE

- Raw material, production, use phase, end of life

OUT OF SCOPE

- Energy savings for operators due to weight reduction, e.g. 10 MWh per Brake Caliper in a standard Metro application for 40 years

■ LCA is...

1. Goal and scope definition
2. Inventory analysis (Input/ Output)
3. Impact assessment
4. Interpretation

■ Rules are laid down in the standards (ISO 14040/44, UNIFE PCR)

■ Clear system boundary

- Direct in-/outputs are in scope
- Indirect effects (e. g. less consumption by weight reduction) are out of scope

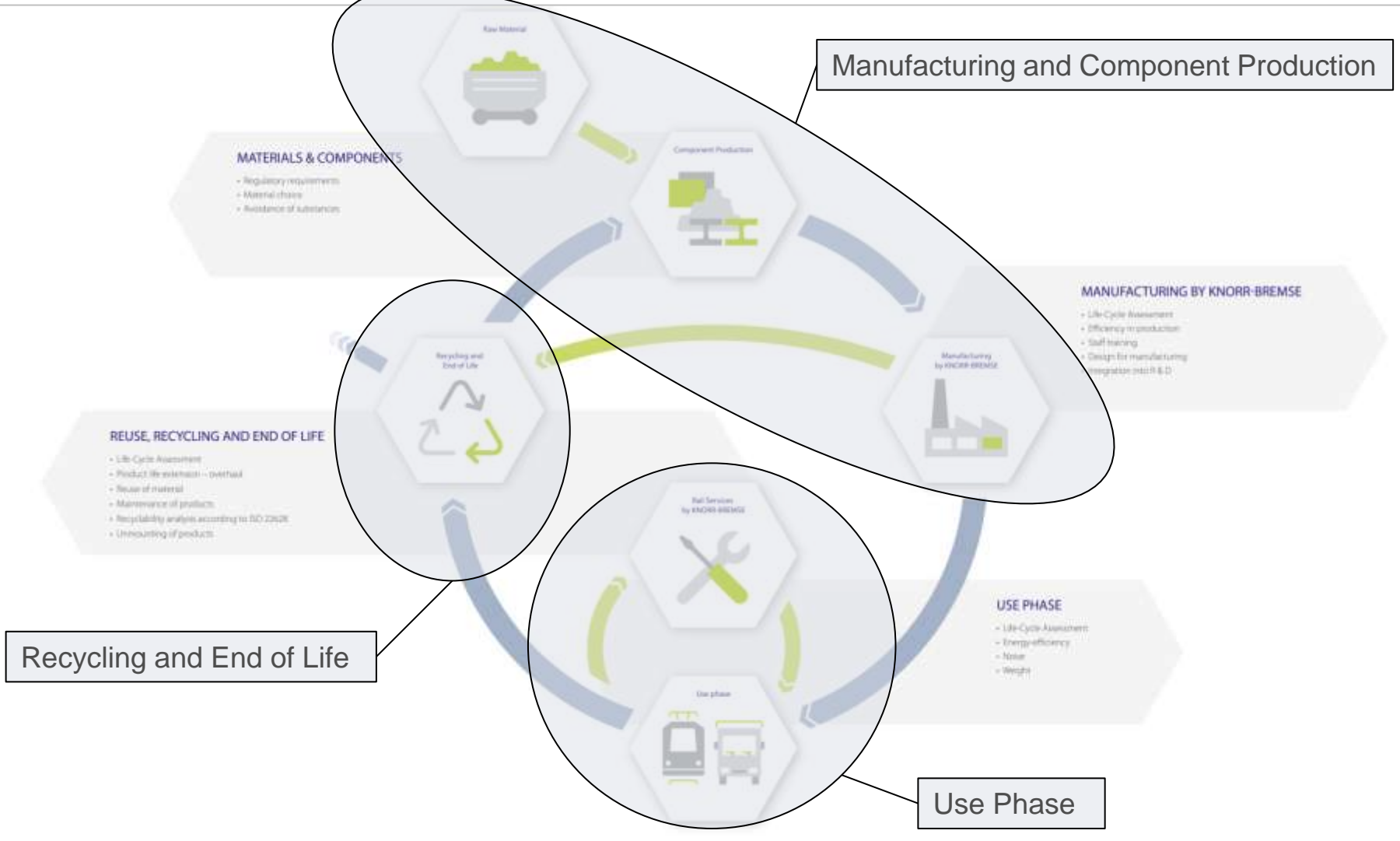
■ Cradle to grave view

■ Assumptions are used (lifetime, number of overhauls,...)

■ LCA on CO₂-emissions (Product Carbon Footprint)

-> a subset of an EPD (Environmental Performance Declaration)

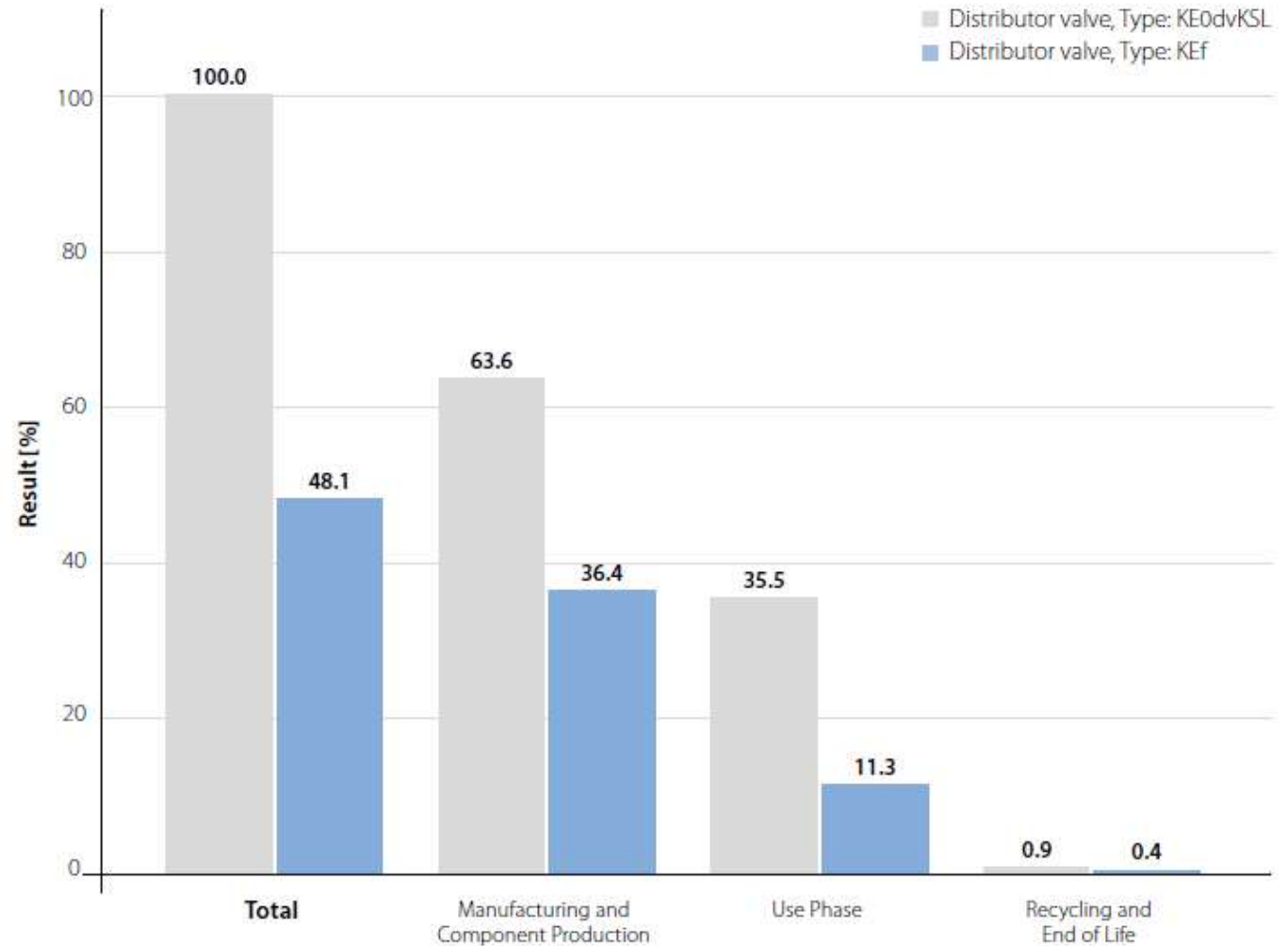
Life Cycle Stages of KB-products



Result: Valve

LIFE-CYCLE ASSESSMENT – FOCUS PRODUCT CARBON FOOTPRINT

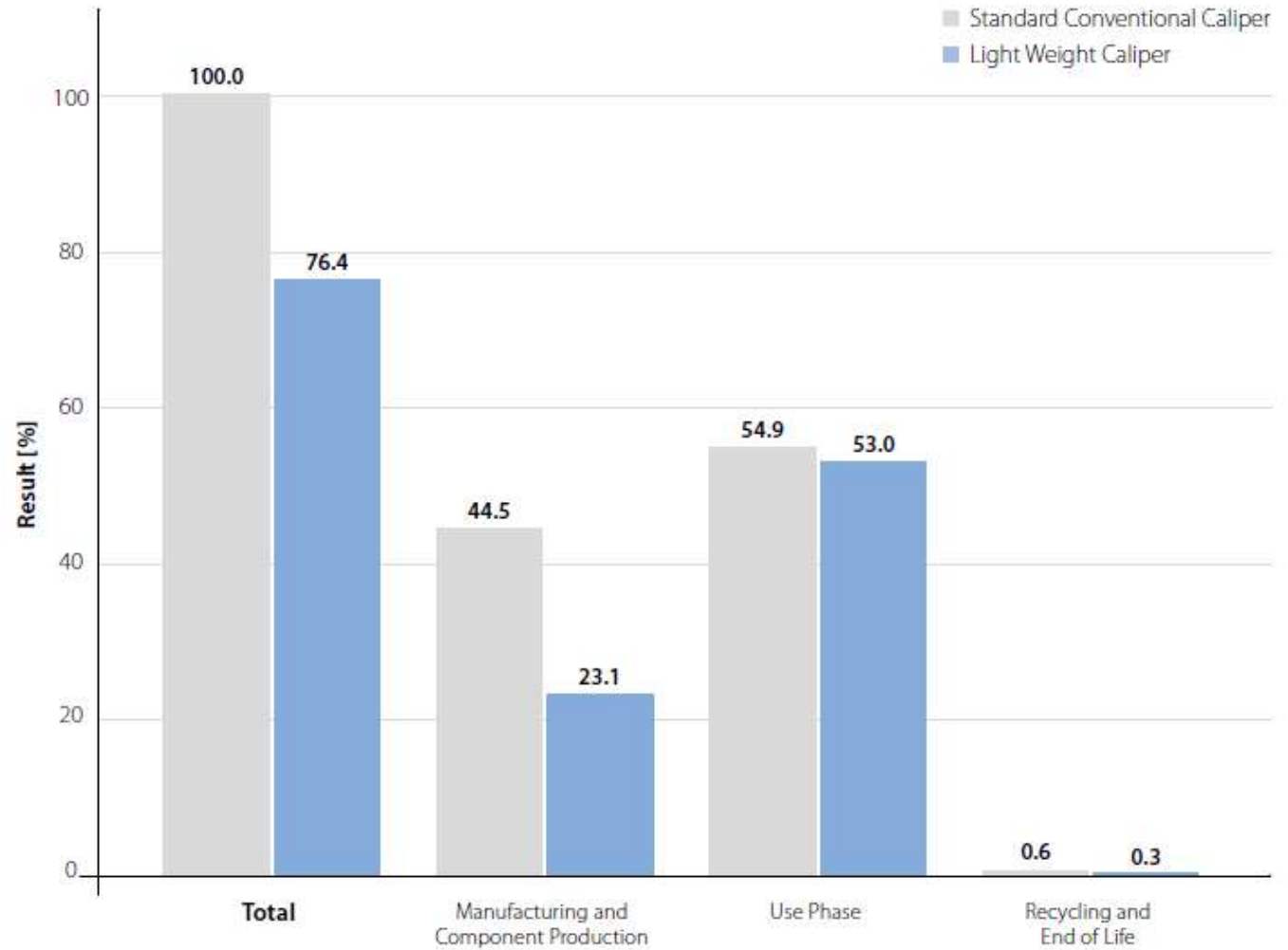
Distributor valve, Type: KEf saves 52% CO₂-emissions during its lifetime compared to the distributor valve, Type: KE0dvKSL



Result: Caliper

LIFE-CYCLE ASSESSMENT – FOCUS PRODUCT CARBON FOOTPRINT

Light Weight Caliper saves 24% CO₂-emissions during its lifetime compared to the Standard Conventional Caliper

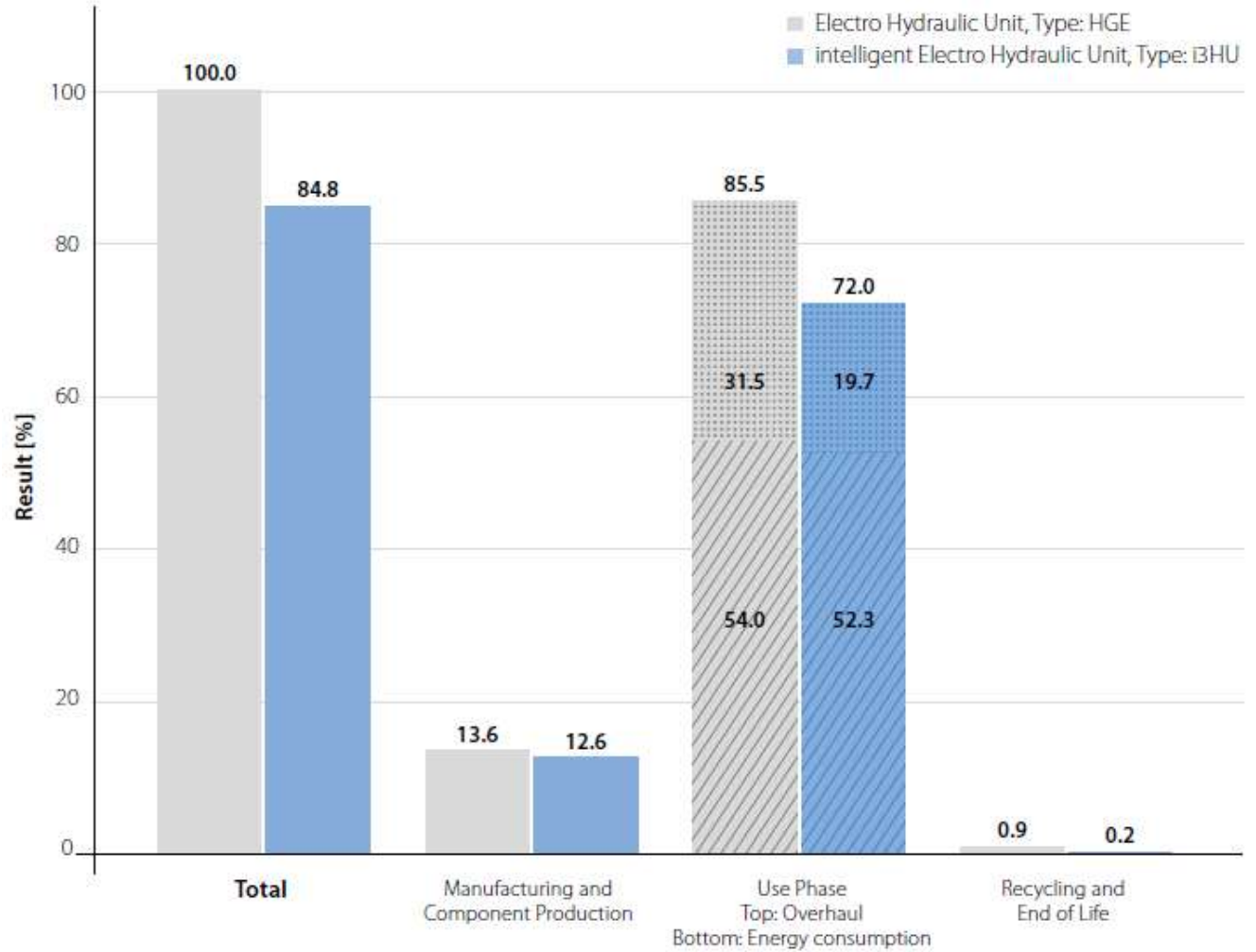


Result: Hydro device

LIFE-CYCLE ASSESSMENT – FOCUS PRODUCT CARBON FOOTPRINT

intelligent Electro Hydraulic Unit, Type: i3HU saves 15% CO₂-emissions during its lifetime

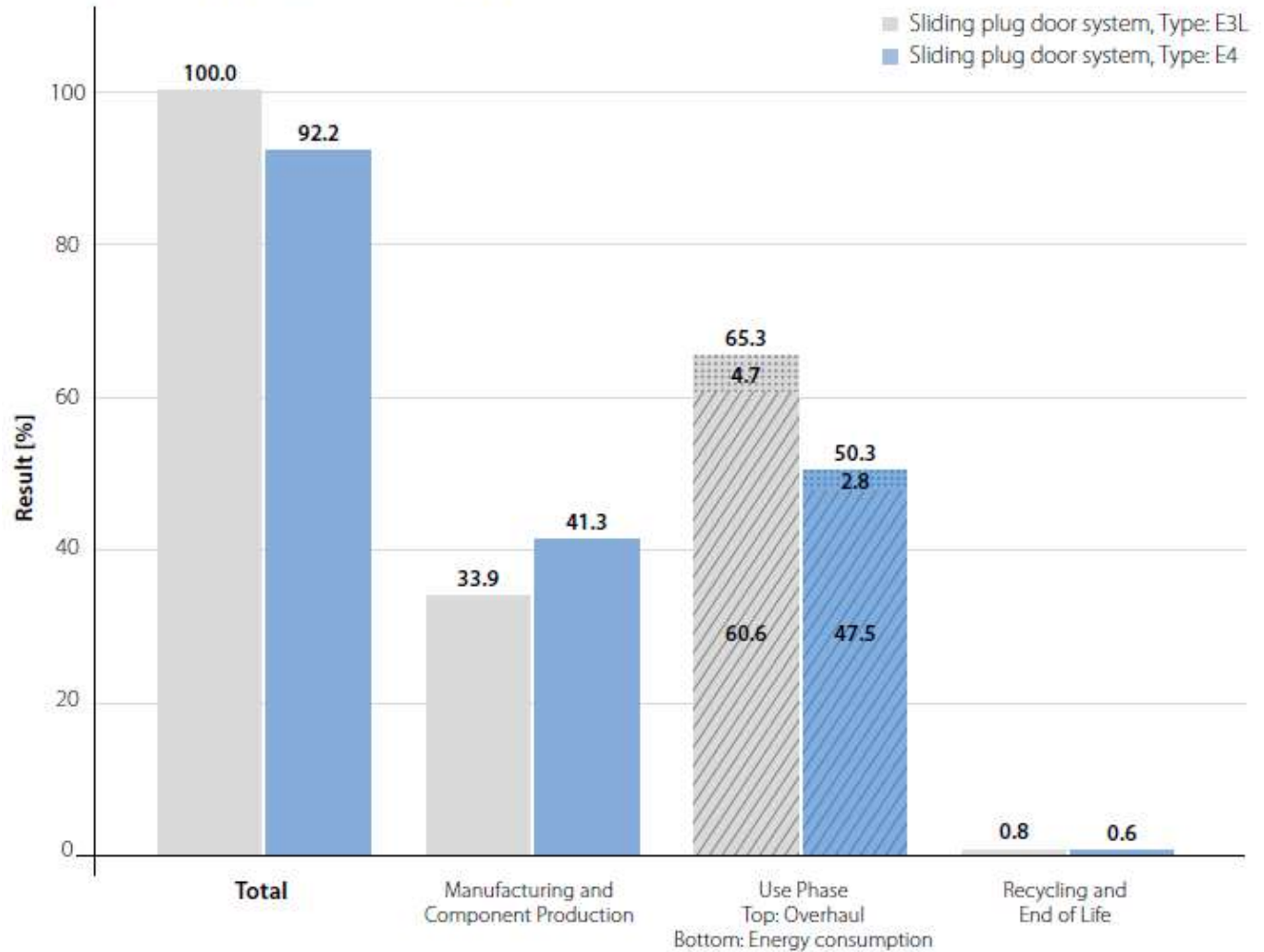
compared to the Electro Hydraulic Unit, Type: HGE



Result: Door

LIFE-CYCLE ASSESSMENT – FOCUS PRODUCT CARBON FOOTPRINT

Sliding plug door system, Type: E4 saves 8% CO₂-emissions during its lifetime compared to the sliding plug door system, Type: E3L



Thank you for your attention!

ecodesign.

LIFE-CYCLE ASSESSMENT & LCA BY KNORR-BREMSE

LIFE-CYCLE ASSESSMENT - FOCUS PRODUCT CARBON FOOTPRINT
 For example on the installation

MATERIALS & COMPONENTS

- Regulatory requirements
- Material choice
- Availability of substances

REUSE, RECYCLING AND END OF LIFE

- Life Cycle Assessment
- Design for environment - DfE
- Design for disassembly
- Maintenance of products
- Responsibility aspect according to ISO 14001
- Greenwashing prevention

WHEELS FOR TRAINS (WHEELS FOR THE CITY)

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