



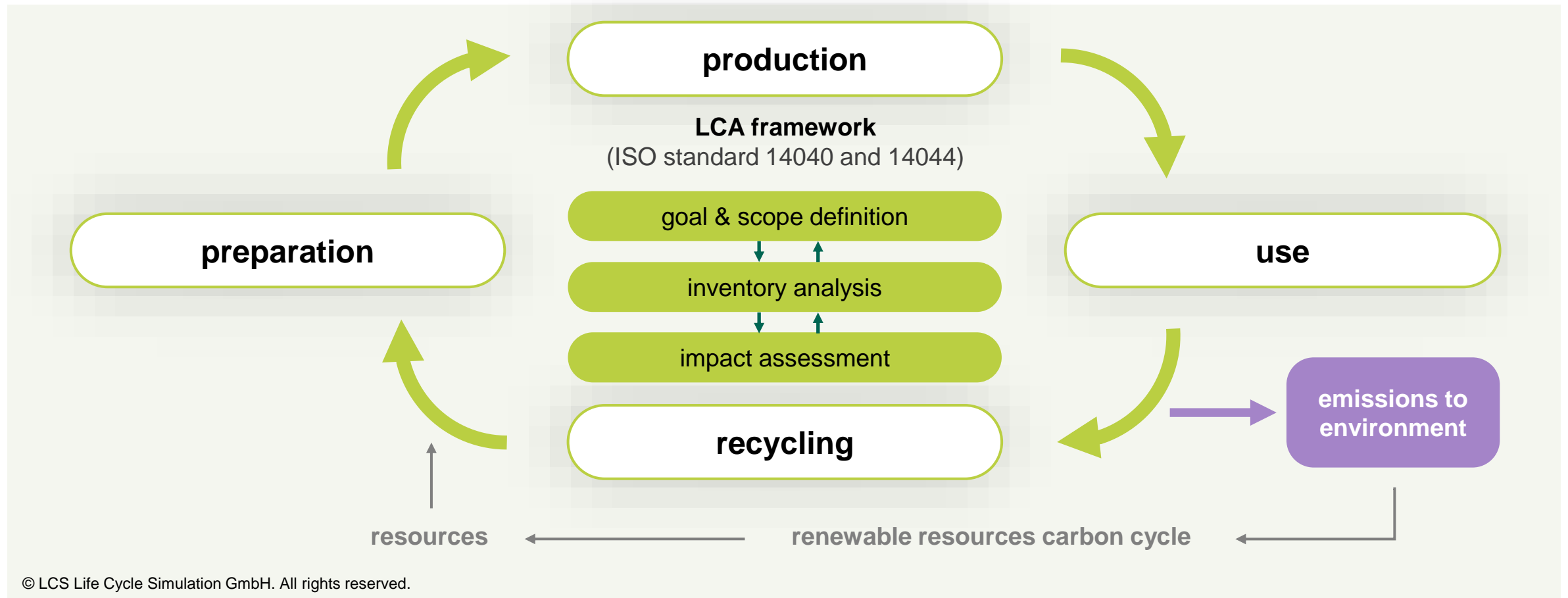
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Use phase in LCA

LCS Life Cycle Simulation GmbH
2024-03-14 EU Top Gear Workshop

Methodical approach - CO₂ balance

Life cycle assessment as a standard for resource efficiency and sustainability



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Use phase in LCA



In many R&D projects, the developed demonstrators do not reach the production line. How can the use phase still be taken into account?

General approach

- Detailed description of use phase
 - Mobile application (weight, weight differences, energy demand, maintenance, repair)
 - Immobile application (maintenance, repair)
- Data collection, evaluation, modeling
- Sensitivity analysis

Use phase in LCA

Mobile application – boundary conditions



Use phase boundary conditions*

- Example: Mercedes-Benz C 180, super fuel, Euro 6d-ISC-FCM
- Empty weight: 1.625 kg
- Distance life cycle: 150.000 km
- Factor for weight related consumption reduction
0,15 l/100km x 100kg** (super fuel)

Outlook changes in the use phase

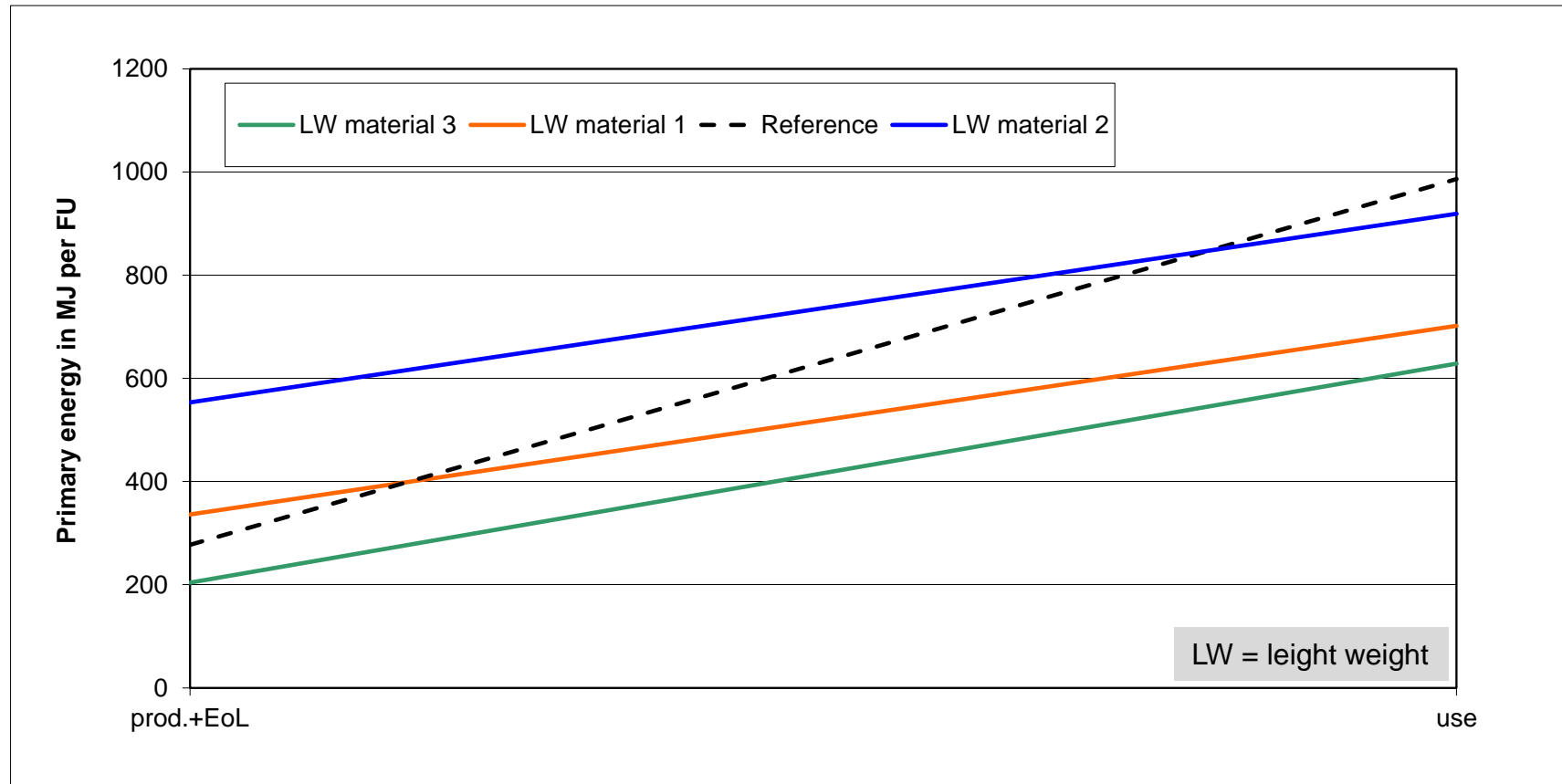
- Plugin-in-Hybrids (PHEV) and electric vehicles (EV) will have lower emissions when battery charging is done by renewable power-mix
- Factor for weight related consumption reduction
0,298 kWh/100km x 100kg** (BEV)
- Energy savings through lightweight construction in conventional vehicles are significantly higher than with BEVs.

Sources:

- *2022-11 down load technical data: <https://www.mercedes-benz.de/passengercars/mercedes-benz-cars/models/c-class/saloon-w206/specifications/c-class-saloon-nba.module.html>
- **2021: Entscheidungsunterstützung zur Planung und Bewertung nachhaltiger industrieller Wertschöpfungsketten - dargestellt am Beispiel von Fahrzeugteilen, Ph.D. thesis Richard Carl Müller, KIT-Fakultät für Wirtschaftswissenschaften des Karlsruher Instituts für Technologie (KIT), page 379 (fuel), page 383 (BEV)

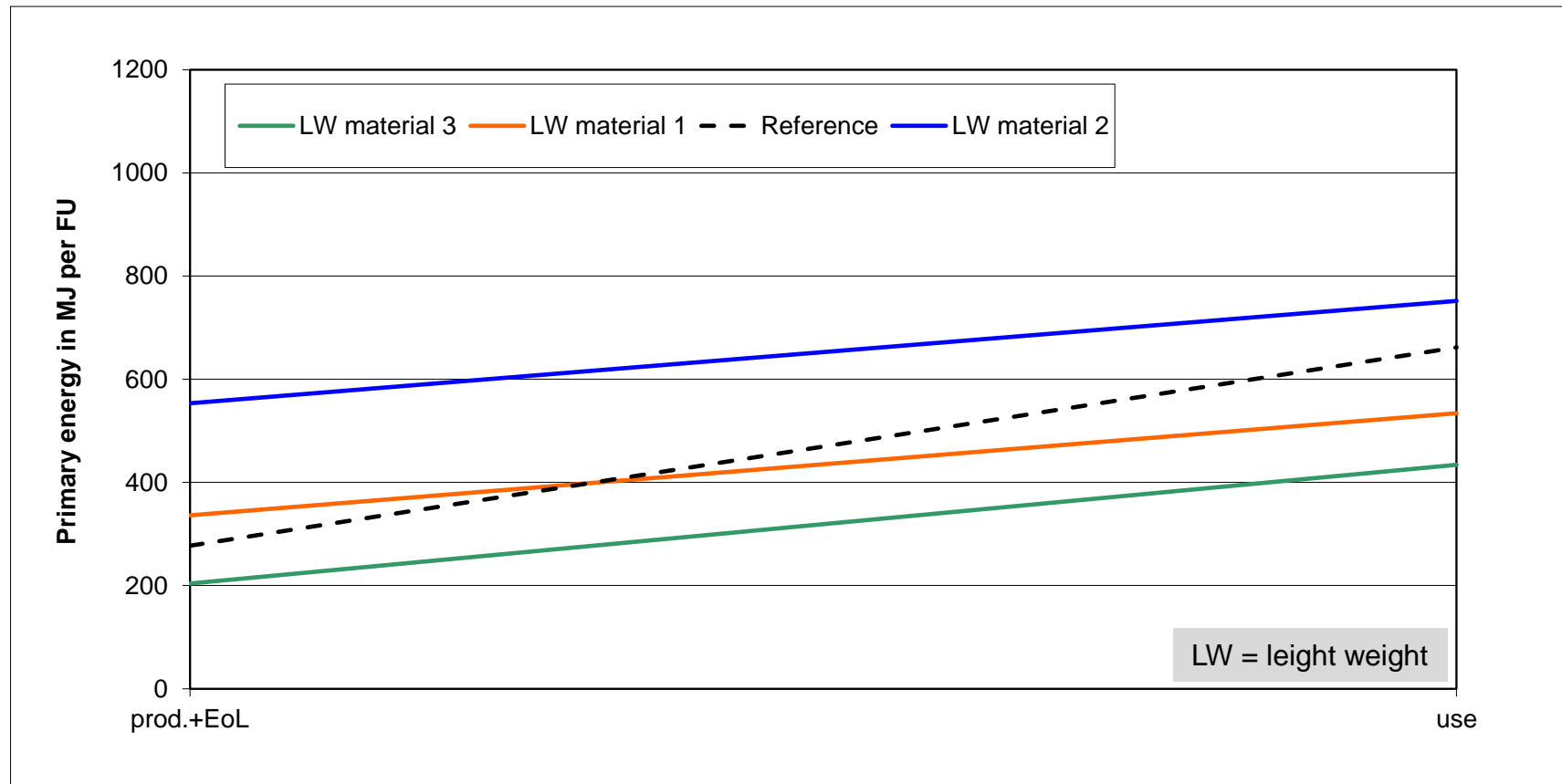
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Mobile application (fuel) – example different materials



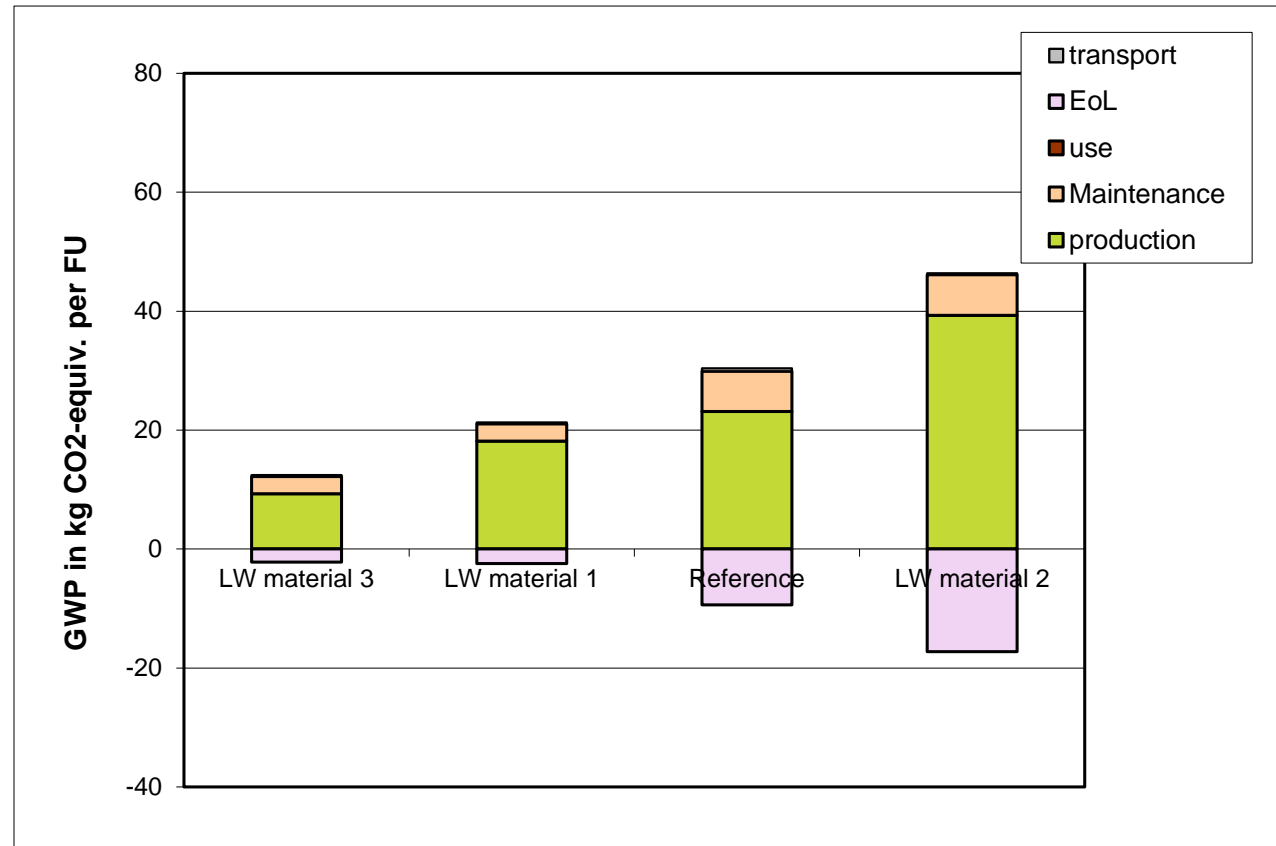
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Mobile application (electric) – example different materials



Use phase in LCA

Immobile application – example different materials



LCS Life Cycle Simulation GmbH

Our Team



Matthias Harsch (Dr.-Ing.)
Managing director

matthias.harsch@lcslcs.de



Maximilian Saiger (M. Sc.)
Sustainability expert

maximilian.saiger@lcslcs.de



Nadja Sommer (M. Sc.)
Sustainability analyst

nadja.sommer@lcslcs.de



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