Application of LCA in the automotive industry

UNECE GRPE
Workshop on Life Cycle Assessment
2022-05-31
Complexity I

- Vehicles are complex products
  - ca. 5,000 parts
  - ca. 10,000 part/material infos
  - ca. 40,000 processes in LCA
- High effort for calculation of sophisticated vehicle LCA
- Poor availability of LCI background data with higher spatial & temporal resolution
Complexity II

- Vehicles have complex supply chains
  - International/global structure
  - Many tiers involved (3-7 levels)
  - Dynamic/changing over time
  - Improvements/reduction measures
- Responsibility for Scope 3 emissions shared among many
- Poor availability, traceability & validation of supplier specific primary data
Flexibility

- ISO 14040 & ISO 14044 allow a wide flexibility for methodological choices, e.g.
  - System boundaries
  - Detail/quality of input data
  - Allocation methods
  - Modelling of End-of-life flows
- Choice of LCI database and datasets may also influence LCA results
Granularity and Comparability

**Level of Detail Product and Material Data**
- Material categories
- Vehicle level/module
- 1000 kg steel

**Level of Detail for Part and Material Production**
- Limited CO2 information of part production process included
- CO2 emission factor per material category, generic worldwide mix
- 2,4 kg CO2/kg steel mix = 2,7 t CO2/car

**Simplified Analysis**
- Material categories
- Vehicle level/module

**Scientific LCA Approach**
- Material sub-categories
- Vehicle part level
- High/low strength steel, alloys, cast iron, recyclates,...

**Product Specific environmental footprint**
- Element level
- Vehicle part or subpart level
- Specific vehicle type
- High/low strength steel, alloys, cast iron, recyclates, including elementary level

**State-of-the-Art in automotive industry**
- Not possible with current method, tools & data

**Comparability**
- Calculation effort
Comparability as the main challenge

- Documentation of methodological choices and chosen datasets is essential for transparency
- **Comparability** of vehicle LCAs remains unsolved with current method, tools & data
Among OEMs, LCAs are applied for different applications. Main fields are:

- Hot spot analysis / improvements
- Research to inform technical developments
- Calculation of scope 3 emissions
- Internal steering of decarbonisation activities
LCA expertise within automotive industry

- Scientific publications
LCA expertise within automotive industry

- Exemplary LCA study results
Conclusion / OICA position

- International guidelines should be formulated to pursue a globally harmonized, fair, practical and transparent LCA methodology.
- Many OICA members however believe that it is premature to cast LCA into legislation.
- OICA therefore requests that this reservation is recorded in any Terms of Reference and no commitment is made at this time for transposition into legislation.
- The example of IWG VIAQ can be taken as a successful development of mutual guidelines without the need for immediate legislation.