Life Cycle Assessment : The future of environmental impact evaluation for vehicles

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LCA policies landscape

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- Why need to look at the whole life cycle of products in the automotive sector?
  - Focus on carbon footprint
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- Linking with Transport and Energy Models
- Way forward and next steps

About UNECE

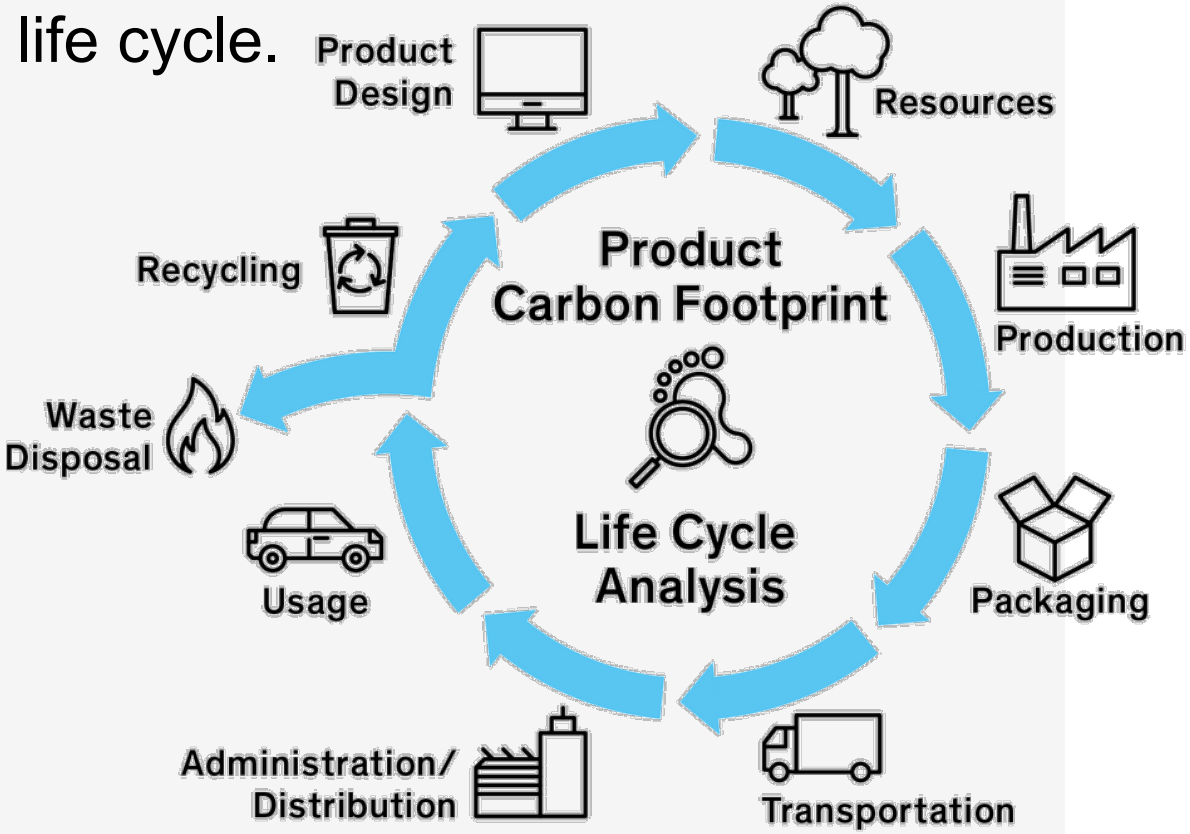
- One of the 5 Regional Commissions of the UN (covering Continental Europe and North America)
- On transport, the Inland Transport Committee (ITC) equivalent to IMO and ICAO for inland transport
- 60 legal instruments (49 in force), 30 legal instruments have countries outside of ECE region
- 152 countries are contracting parties to at least one transport legal instrument
- On vehicle regulations, 3 global agreements with mutual recognition of vehicle certification; covers safety, environment, automation
- Look for the E markings



UNECE

What is LifeCycle Assessment (LCA)?

- LCA the systematic analysis of the potential environmental impacts of products or services during their entire life cycle.
- Closed- (when recycling)
  or open-loop (when disposing)
- Requires new thinking/processes when supply chains are complex
- Link to digitalization of supply chain information



Source: myclimate.org

Taxonomy of LCA standards

Overarching standard

ISO standard **14040** and **14044** series

Sector & product agnostic standards and Guidance

Corporate / organization standards

- GHG Protocol corporate, scope 2 3 standards
- ISO standards 14064
- EU OEF

GREENHOUSE GAS PROTOCOL

Product standards

- GHG Protocol Product LC standard
- ISO standard 14067
- EU Product Environmental Footprint (PEF)

Country specific standards

Sector specific Guidance / Product Category Rules

Global Logistics Emissions Council (GLEC) Framework

European Commission

Organization Environmental Footprint Category Rules (OEFCR)

EPD®

THE INTERNATIONAL EPD® SYSTEM

Product Category Rules (PCRs)

European Commission

Product Environmental Footprint Category Rules (PEFCR)

Source: WBCSD at UNECE, 2022

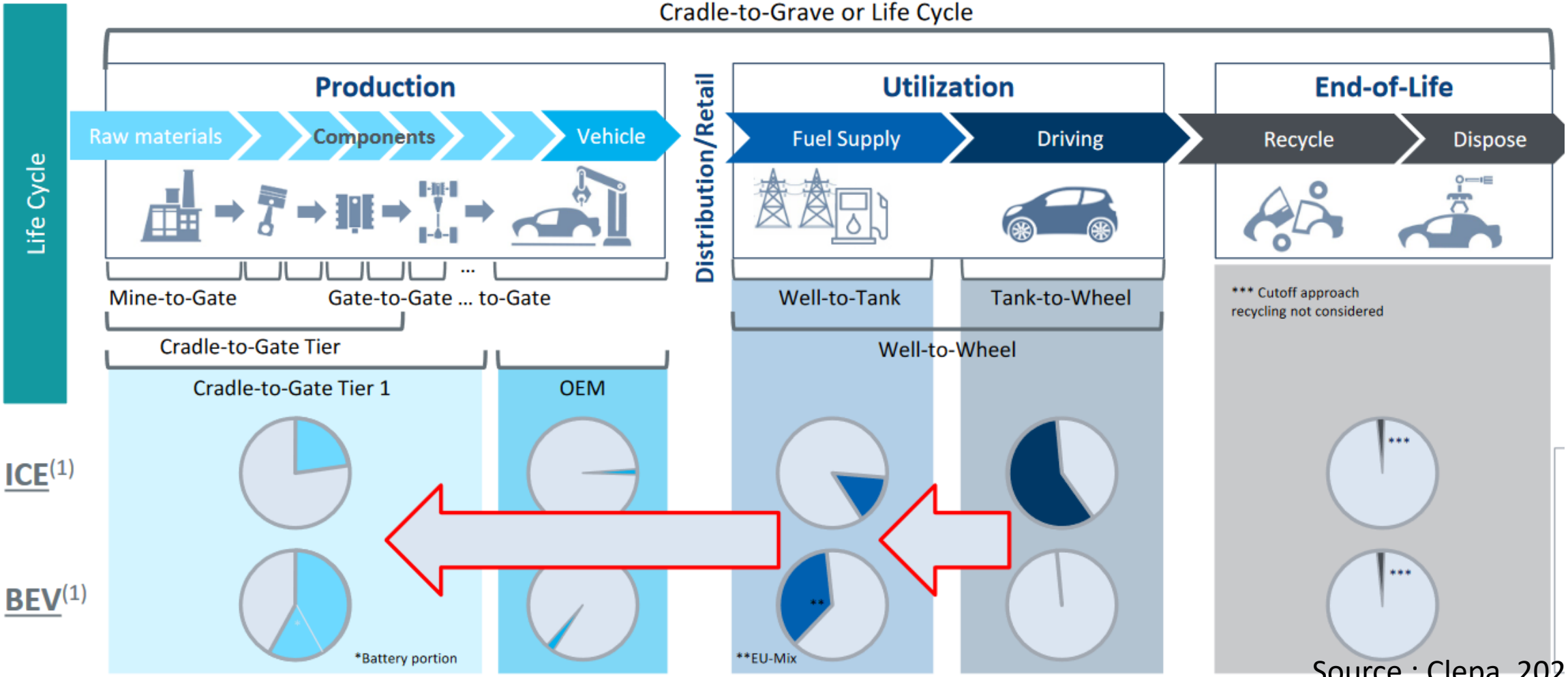
Why need to look at the whole life cycle of products?

- Finance sector under pressure to invest in clean/sustainable corporations
  - ESG, CSR (Scope 1/2/3 emissions) strong tools to demonstrate corporate sustainability

- LCA covers a broad range of environmental/social impact categories
  - parameters such as biodiversity loss, resource depletion, air pollution (non-exhaust emissions), water pollution,… also covered by LCA analysis
  - Climate and GHG the primary focus

Zero tailpipe emissions technologies for vehicles shift GHG emissions to upstream processes

Historically, tailpipe emissions the largest contributor and main criteria regulated

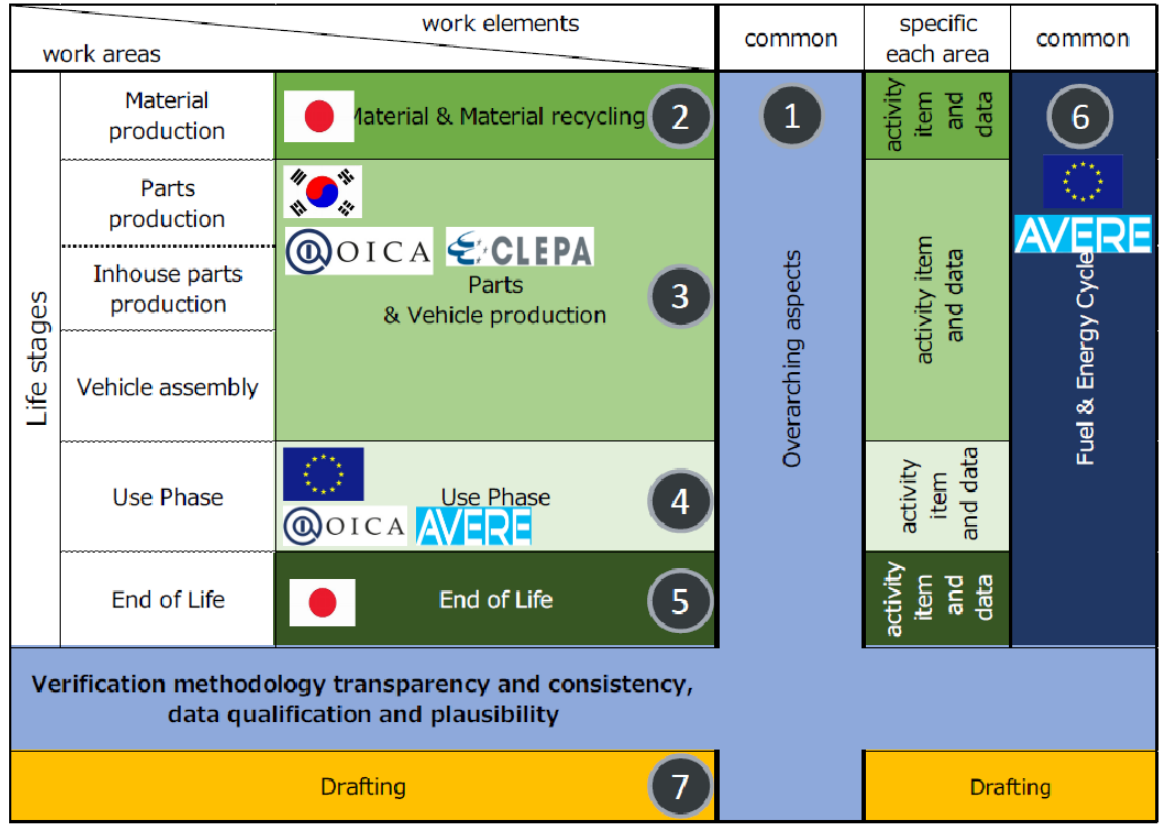


Source : Clepa, 2022

UNECE activity on carbon footprint of vehicles

As part of the World Forum for Harmonization of Vehicle Regulations (WP.29)

- End 2022, Japan and Korea started dedicated activity “to develop an internationally-harmonised procedure to determine the carbon footprint* of different technologies, also considering energy use for energy pathways and automotive types from production to use and disposal, as a resolution under the framework of WP.29”
  - Work split in 7 Sub Groups
  - Strong implication from Japan, Korea, EU, US, industry and other stakeholders
  - Draft methodology expected in 2025
  - Initial focus on cars; vans, trucks and 2/3Ws in the scope



Other non UNECE initiative on product level carbon footprint for the transport/automotive sector

- Many initiatives on-going to develop automotive/transport specific methodologies for product carbon footprint determination; for example:
- Product Category Rules (PCRs) for jets, rail, buses and cars under EPD international
- Industry consortium Catena-X to digitalize automotive supply chain information with application on carbon footprint
- TransensusLCA EU Horizon project to determine a carbon LCA methodology for electrified vehicles.
- Digital Product Passports gaining momentum in the transport sector, with carbon footprint high on the impact parameters included
- SBTi for automakers
- Etc…

LCA models

- Dedicated models to perform LCA analysis

LCA models for transport

- IPCC AR6 Chapter 10
  - Dedicated appendices following request for data from the lifecycle assessment (LCA) community
  - Lifetime GHG and cost values based on 30 publications
- GREET model
  - Freely available version US focused
  - International/global version on the pipeline
- GreenNCAP : generic approach applied to specific Brand/Model
- ICCT
- …

Introduced today:

- FKFS
- IEA

How can transport/energy models include LCA approaches

- Energy balances / Emission inventories not fit for LCA purposes
  - Many LCA energy / emissions not attributed to the transport sector
  - Electricity own “sector”
  - Vehicle production attributed to industry
- Lack of robust input data for some LCA phase
  - Vehicle production
  - End-of-Life
- Dedicated models needed; is integration of LCA concept possible in IAMs?

Way forward and next steps

- Some countries /regions are starting to include LCA considerations into their regulatory frameworks
  - France linking EV manufacturing (and transport) GHG emissions with subsidy scheme
  - EU added article in CO2 legislation requiring “The Commission shall by 31 December 2025 publish a report setting out a methodology for the assessment and the consistent data reporting of the full life-cycle CO2 emissions of passenger cars and light commercial vehicles that are placed on the Union market.”
- LCA approaches to become the norm in transport/energy modelling?
  - More data transparency needed to feed models
- UNECE to contribute to harmonized approaches

Thank You

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