Considerations for adopting LCA by automotive industry

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Current regulation

Fuel suppliers

Renewable Energy Directive
Minimum % of renewable fuel in road transport fuel

OEMs

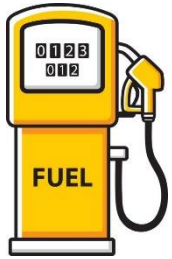
Tailpipe CO_2 regulations
Regulate total CO_2 output from vehicle (zero for EVs and FCEVs)

Regulation (EU) 2019/631: "The Commission shall no later than 2023 evaluate the possibility of developing a common Union 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. The Commission shall transmit to the European Parliament and to the Council that evaluation, including, where appropriate, proposals for follow-up measures, such as ***legislative proposals***"

Challenges of the current policy – why move to a life-cycle CO_2 approach?

A. **Vehicle construction & end of life** is not included within scope of tailpipe CO_2 regulation, so risk of increasing environmental impact of vehicle construction whilst trying to meet tailpipe CO_2 targets

B. **Separate regulation** for fuel suppliers and OEMs, despite the fact that the lifecycle CO_2 emissions of a particular vehicle are strongly dependent on the type of fuel that is used within that vehicle.



C. **Some impact categories are not** considered in the vehicle tailpipe legislation and RED

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- A full life-cycle-assessment (LCA) includes impact categories beyond just global warming potential – eutrophication, acidification, human toxicity impact etc.
- Can be challenging in LCA studies to obtain data, and assess consistently and reliably the non-CO_2 impacts
- Non-CO_2 impacts can be very location-specific

Discussion: Regulations focussed on specific sites e.g. manufacturing plants or mines, local environmental regulations, and industry good-practice standards are all likely to be more effective in addressing non-CO_2 environmental impacts than integrating these into existing legislation.

Separate regulation for fuel suppliers and OEMs

This results in:

- No consideration in the tailpipe CO_2 regulations of the emissions from fuel production
- No driver for the OEMs and fuel suppliers to collaborate to find the lowest cost / most effective decarbonisation options from fuel/engine synergies

But separate legislation does:

- Push OEMs towards higher vehicle fuel efficiency
- Push fuel suppliers towards supplying higher blends of renewable fuel

Discussion: are there areas where collaboration between fuel suppliers and OEMs could facilitate the use of higher blends of renewable fuel?

Vehicle construction & end of life - why is this important?

- For gasoline and diesel vehicles, embedded CO_2 emissions roughly 10 - 30% of lifetime CO_2 emissions (5 – 8 tonnes CO_2e/vehicle)[1].
  - Embedded GHG emissions generally higher for BEVs (6 – 16 tonnes CO_2eq/vehicle)[1]
  - Embedded CO_2 emissions will become an increasingly high % as fuels decarbonise
- Recently concern has risen over some specific aspects of vehicle construction:
  - Emissions from the production of EVs and FCEVs, including need to replace batteries during lifetime of the vehicle
  - Recycling / disposal of batteries
- Nevertheless there are many other regulations around aspects of vehicle construction (lead-free solder, hazardous materials, etc.) which are already legislated or governed by internal OEM standards.

1. https://www.lowcvp.org.uk/assets/reports/LowCVP-LCA_Study-Final_Report.pdf

Vehicle construction & end of life – challenges to assessing and understanding CO_2 emissions

- Consistency of methodology – currently no industry-wide methodology for assessing CO_2 impacts of vehicle construction – even following ISO standards leaves room for interpretation
- Availability of data – data may not currently be collected, or may be commercially confidential
- Consistency of data –including when data is collected, measurement and verification method, units in which it is collected

Discussion: how could the industry work to overcome these challenges? E.g.

- *Understanding impact of different methodological choices on embedded vehicle CO_2 emissions & developing harmonised methodology*
- *Gathering data internally within companies, including establishing industry-wide principles for data gathering method, units etc.*
- *Establishing standardised industry data or databases*

Vehicle construction & end of life – how could legislation be implemented?

Standard for vehicle embedded CO_2 emissions:

- Legislation could require: mandatory reporting, voluntary standards, or mandatory targets etc.
- Limits on embedded vehicle CO_2 emissions could be defined: for a given vehicle segment, or across whole OEM fleet, or limit on every individual vehicle etc.
- Would need a defined methodology.
- Would require either detailed data collection by OEMs, or a default dataset across the industry

Introduce measures that target only specific aspects of vehicle construction, which have a big impact on overall vehicle CO_2 intensity:

- These could be either negative impacts, which are regulated or limited (~existing legislation that limits use of hazardous materials in construction) ; or positive impacts which are incentivised e.g. through Eco-innovations
- Would need strong evidence that the individual measure or material would have a big impact on overall vehicle CO_2 to make this approach worth adopting
- Legislation could also tackle non-CO_2 impacts

Summary of key discussion points

- Regulations focused on specific sites e.g. manufacturing plants or mines, local environmental regulations, and industry good-practice standards are all likely to be more effective in addressing **non-CO_2** environmental impacts than integrating these into existing legislation.
- Are there areas where **collaboration between fuel suppliers and OEMs** could facilitate the use of higher blends of renewable fuel?
- How could the industry work to overcome key challenges to **assessing and understanding** CO_2 emissions from vehicle construction and end of life?
- What **legislation** could be used to reduce CO_2 emissions from vehicle construction and end of life, and what would be the impacts of these options for OEMs?