

## Impacts on fuel producers and customers of conflicting rules for LCA

Fuel producers and other commodity suppliers are increasingly affected by conflicting rules for life cycle assessment (LCA). They may get multiple requests for LCAs to be used in various contexts. This may require the application of different methodological approaches that may vary in scope, system boundaries, data demands and more. This results in increased cost and competence requirements for producers as well as confusion among other actors including their customers. Differences in methodologies might also lead to various outcome, conclusions and conflicting guidance regarding what fuel to prioritize or develop. We have studied the actual differences when applying different frameworks. The EU Renewable Energy Directive (RED), the EU framework for Product Environmental Footprints (PEF), and the frameworks of Environmental Product Declarations (EPD) all have different assessment and modelling requirements. The work has contained both an analysis of the methods from a conceptual point of view and by carrying out case studies on selected fuel production pathways (ethanol from corn, fatty acid methyl ester, biogas from food waste, HVO from used cooking oil, advanced ethanol from food waste and sawmill residues and pyrolysis oil from used tires).

Results obtained for a specific fuel could differ substantially depending on the framework applied and the assumptions and interpretations made when applying this framework. Especially modelling of waste management can be very important for the results when the biofuel is produced from waste. Our results indicate a much higher climate impact for, for example, HVO and biogas when assessed with the PEF framework compared to the other frameworks. This is because PEF assigns at least part of the production of primary materials and energy to the use of recycled material and recovered energy. Developing Category Rules for biofuels for PEF and EPD could and should help clarifying remaining ambiguities.

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