Methodology for Product Carbon Footprint Calculations for Lubricants and other Specialties

Webinar hosted by UEIL on May 28th 2024

UEIL and ATIEL

Two Associations to represent the European Lubricants Industry

UEIL (the Union of the European Lubricants Industry) represents the interests of the lubricants industry in Europe, with a special focus on SMEs and independent companies that produce lubricants and metal processing fluids essential for the automotive and industrial sectors.

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ATIEL is the Technical Association of the European Lubricants Industry and a non-for-profit association (ASBL) representing the combined knowledge and experience of leading European and international engine oil manufacturers and marketers.

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Sustainability journey milestones

2019
UEIL Task force starts to prepare sustainability strategy

2020
Taskforce turns into a standing Sustainability Committee (SC) and organizes into work groups to cover the lube value chain

2021
ATIEL sustainability committee kicks off and starts to cooperate with UEIL SC

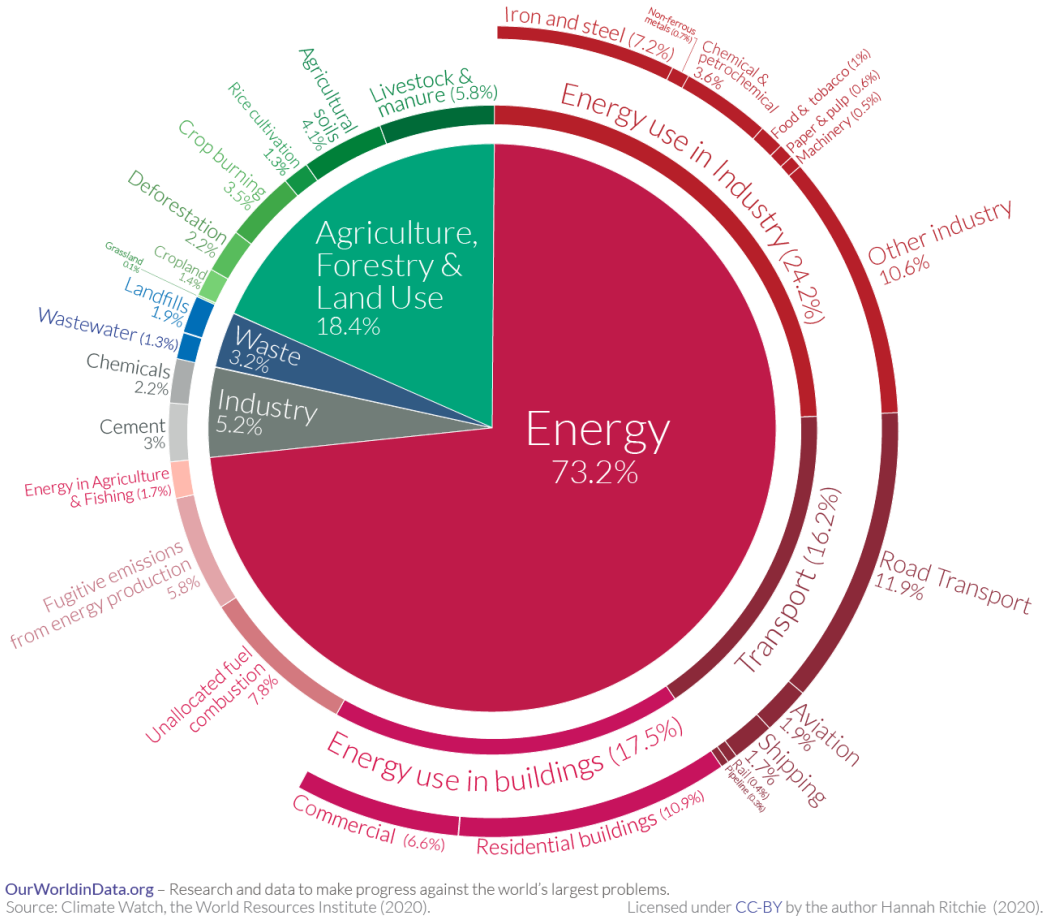
2022
ATIEL & UEIL joint PCF Working Group was formed

2023
ATIEL & UEIL methodology for PCF is published

2024
The journey continues in collaboration

Product Carbon Footprint

"Sum of Greenhouse Gas emissions and Greenhouse Gas removals in a product system, expressed as CO_2 equivalents […]", ISO 14067:2018



OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020). Licensed under CC-BY by the author Hannah Ritchie (2020).

Product Carbon Footprint of Lubricants

WHY

- Regulators, Consumers and Equipment Manufacturers require the submission of PCF for products sold. Our products' PCF becomes part of our customers' PCF.
- ISO 14067 is not precise enough to be able to assure compatibility of PCF-calculations in a specific sector like the lubricants industry
- There is a need for harmonization and clear definition how to calculate and REPORT the PCF for lubricants
- Parallel activities in the wider industry
  - "Together for Sustainability" published a PCF-methodology for chemicals – very detailed but not fully applicable for the lubricants sector since different decisions are required for manufacturing lubricants and greases compared to chemicals
  - API has published Technical Report 1533 – leaving many options

PCF – Relevance for our industry

Why are methodologies needed and how do they contribute to transparency ?

No methodology

- Even with greatest care applied, results cannot be compared, thus might be meaningless for downstream partners in the value chain
- Moreover, results without transparency **how** they were calculated are meaningless at all

ISO 14067

- Gives a framework in which to operate
- Defines mandatory elements to consider
- Defines minimum requirements for reporting
- BUT: is not a detailed How-to-guide; requires manifold decisions to be taken leading to non-comparable results

Sector-specific methodology based on ISO14067

- Addresses all requirements of ISO14067
- Contains guidance for methdological choices which ISO left open to decide
- Defines categories for data sources and quality indicators
- Basis for **harmonizing PCF-results** if calculated with similar and certified methodologies

Product Category Rule based on ISO14067

- Addresses all requirements of ISO14067
- Mandates methodological choices and data sources for a **specific** product group
- Required for complex processes/sectors for which a methodology would still leave open too many options
  → for example the refinery sector could benefit from it

Joint UEIL/ATIEL – PCF – Task Force

HOW

- UEIL and ATIEL enable for harmonization and clear definition how to calculate the PCF for lubricants, compatible with TfS and API:
  - Chemical industry (TfS): methodology has been endorsed by ATC representing the additive suppliers
  - API has published a Technical Report which is endorsed by the US base oil suppliers
- **UEIL/ATIEL PCF-Task Force started Jan 2023**
  - 6 months - 1 working group – 10 members (ATIEL, ELGI, GEIR, UEIL, UNITI/VSI, TfS) – 1 consultant – 4 personal meetings - 17 online meetings to develop the draft ready for consultation phase June/July 2023 – feedback considered from many associations

WHAT

- UEIL/ATIEL-Methodology Rev. 0 published Oct 6th 2023
- TÜV-Rheinland 3rd party review led to Rev. 1, published Nov 30th 2023

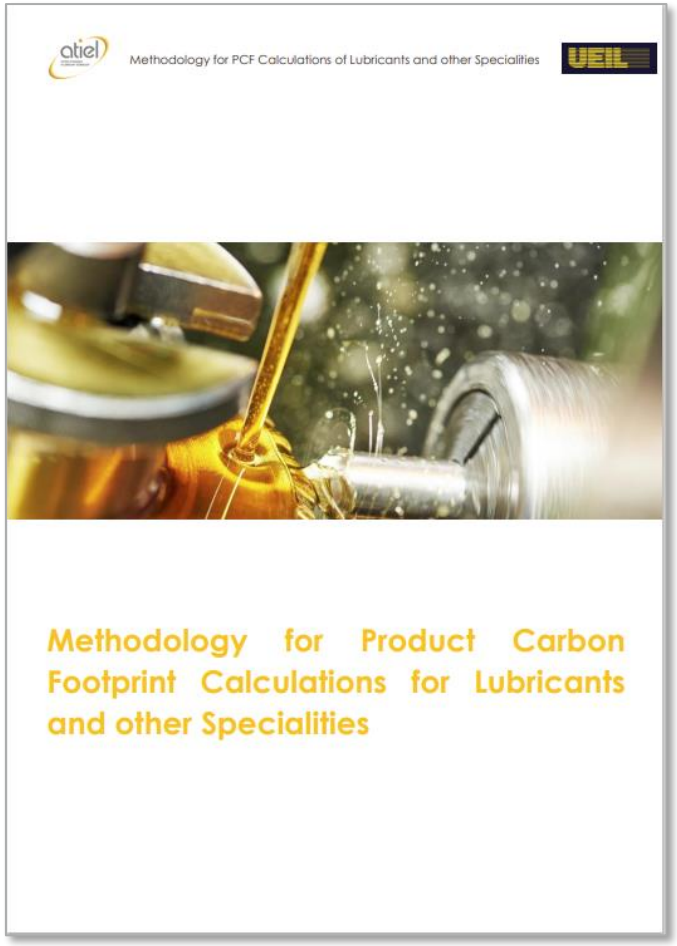
Joint UEIL/ATIEL PCF Methodology

BASIS

- ISO 14067:2018
- GHG Protocol Product Standard

GOAL

- to **harmonize PCF-calculations** of lubricants and other specialities across the value chain
- achieving **alignment in the lubricants industry**, resulting in transparency, comparability, and acceptability of PCF calculations for their stakeholders
- **intended audience** is internal and external stakeholders globally, being, for instance: Customers, Suppliers, Lubricant industry, Legislators, Investors, LCA/PCF auditors and practitioners



Joint UEIL/ATIEL PCF Methodology

Acknowledgement

- This methodology was **developed by UEIL and ATIEL together with Carbon Minds GmbH, Cologne, and supported by other industry advisors**.
- UEIL and ATIEL sincerely **thank all the experts involved** in and supporting the process, as well as **all associations from around the globe who gave their valuable input to refine the methodology to its final stage**.
- UEIL and ATIEL would like to encourage all lubricant industry stakeholders to make themselves familiar with the given methodology, support the introduction throughout the whole lubricant industry and endorse this methodology in other frameworks adjacent to the lubricants industry

Independently Reviewed

"**TÜV Rheinland Energy GmbH** (hereinafter TÜV Rheinland) has carried out an independent review of the UEIL/ATIEL methodology (developed by Carbon Minds GmbH and UEIL/ATIEL) for the calculation of Product Carbon Footprint of Lubricants and Specialities. Scope of the review was to check if the methodology meets the general requirements of the international standard ISO 14067: 2018 and GHG Protocol Product Standard. UEIL/ATIEL and Carbon Minds GmbH are responsible for the content and methodology.

In accordance with the standard ISO 14067: 2018 and the GHG Protocol Product Standard, the reviewer concludes that the PCF methodology framework developed by Carbon Minds GmbH and UEIL/ATIEL is scientifically based and reflects the state of the art. The approach and principles behind the methodology are generally appropriate for the assessment of potential Climate Change of lubricants and other specialities. Furthermore, the data planned to be used are appropriate for the goal and scope of the method. Necessary recommendations for the documentation were discussed and implemented by Carbon Minds GmbH. For the future, TÜV Rheinland recommends to continually enhance the PCF methodology in line with the developments in science, technology, and chemical industry and to adapt the methodology documents accordingly."

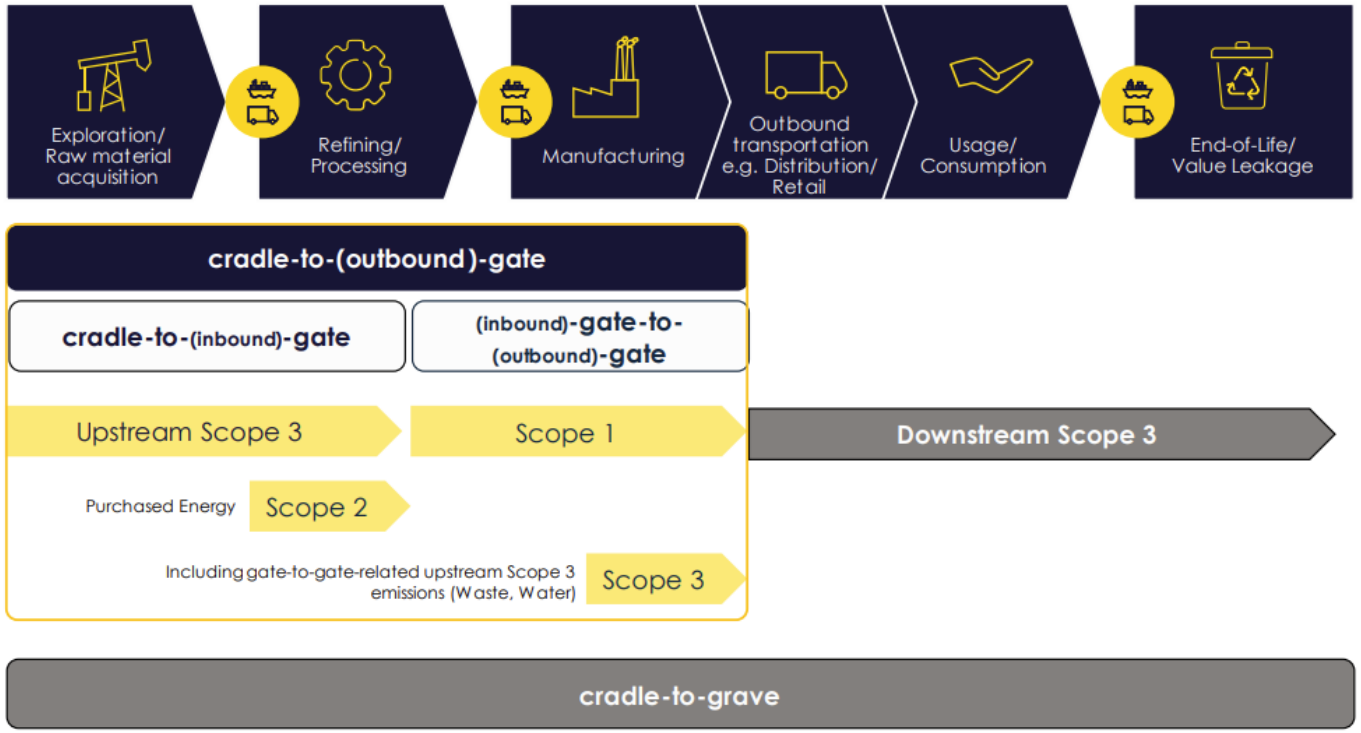
Joint UEIL/ATIEL PCF Methodology

Scope/Declared unit

- **1 kg of unpacked lubricant or other speciality at the factory outbound gate**

Product System

- Comprises the life cycle stages from cradle-to-(outbound)-gate, resulting in a partial PCF calculation
- Covers the raw material extraction and manufacturing up to and including the product manufacturing of lubricants and other specialties, as well as internal storage and transport by the lubricant manufacturer

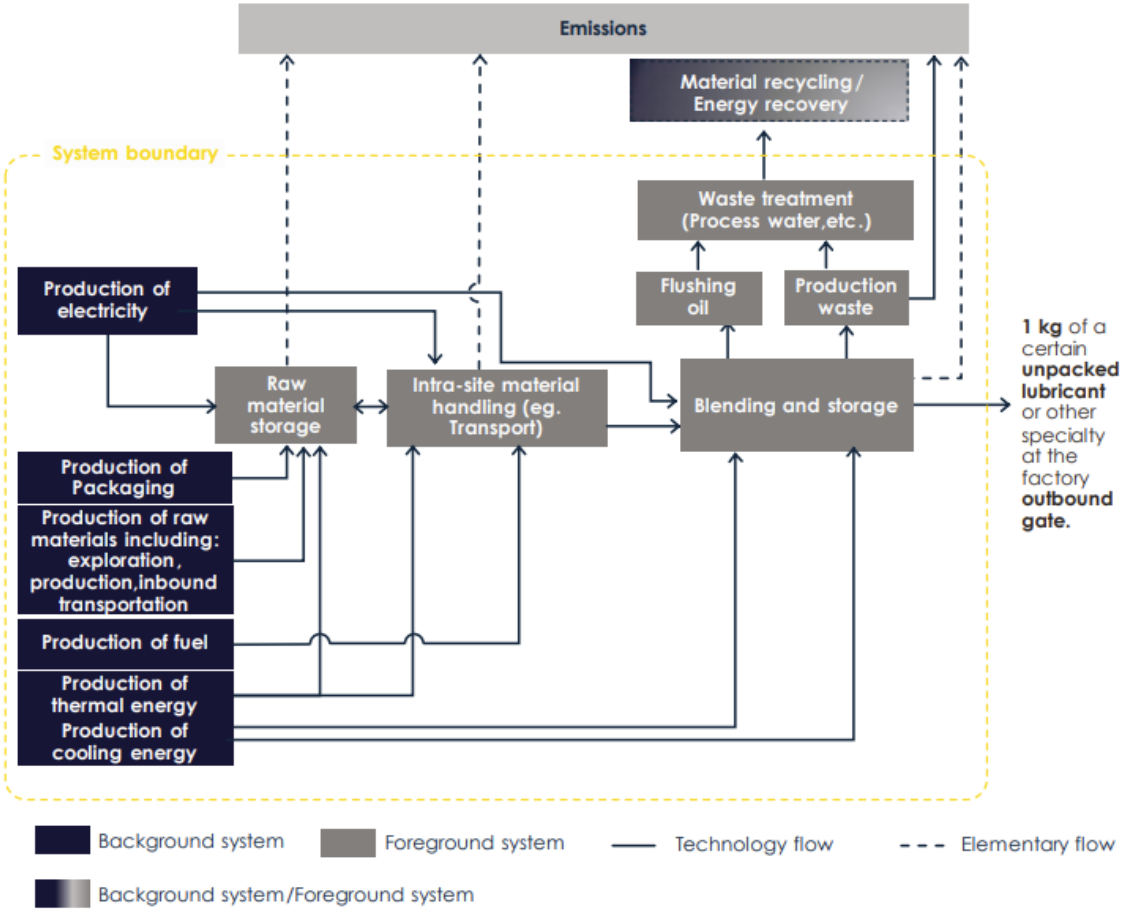


Joint UEIL/ATIEL PCF Methodology

System boundaries

Included (if not excluded due to cut-off criteria)	Excluded
Production-related raw materials	Production of capital goods
Fuel and energy-related utilities (electricity, steam, natural gas, biomethane, oil, etc.)	Business travel or employee commuting
Direct emissions from manufacturing	Services such as engineering or infrastructure services, R&D activities
Other utilities consumed (process water, inert gas, etc.)	Downstream transportation
Production losses and treatment of waste and wastewater	Downstream packaging
Upstream transportation	
Upstream packaging	

Joint UEIL/ATIEL PCF Methodology



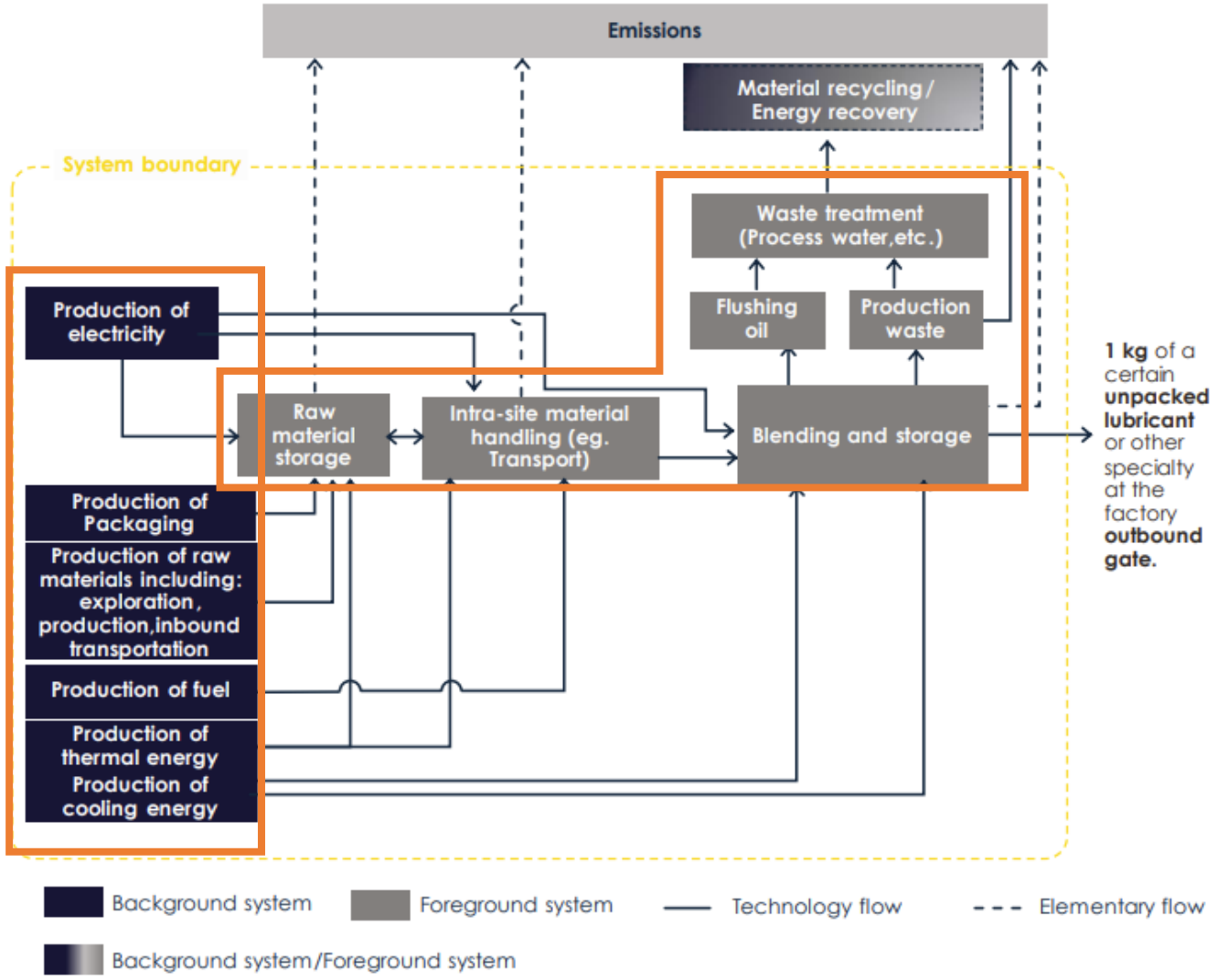
Data collection

- **stereotypical production process of a lubricant manufacturer** within the defined system boundary
  - For PCF-calculation, data for all elements within the system boundaries have to be collected
- In the **foreground system**, at the lubricant manufacturer's production site, all processes that are under the control of the lubricant manufacturer are presented.
- In contrast, the **background system** consists of all processes that the lubricant manufacturer does not directly control, such as the production of electricity, fuel, thermal energy and raw materials…

Data sources

- For foreground system:
  - use primary data

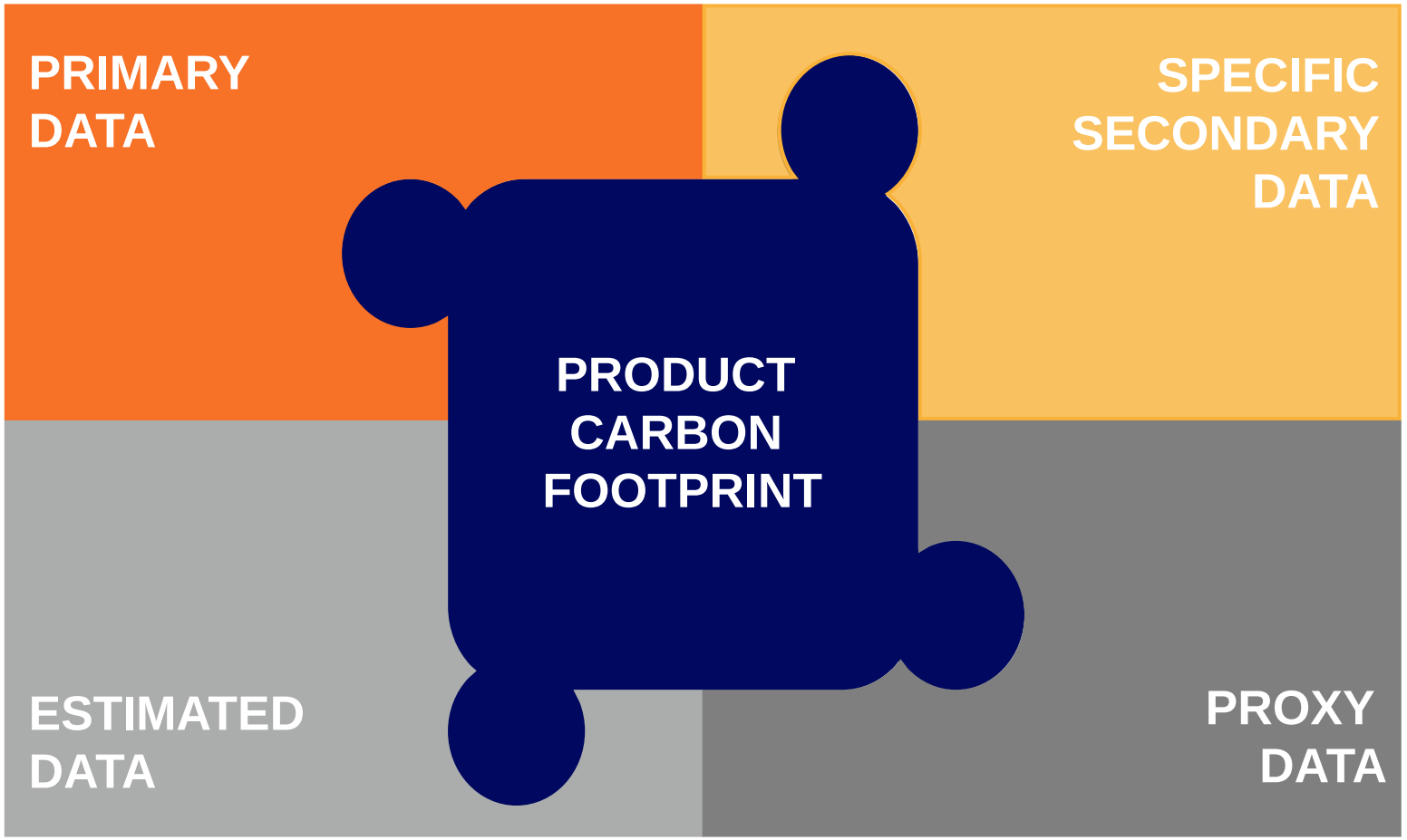
- For background system:
  - Have to ask suppliers
  - Data bases, literature etc



Joint UEIL/ATIEL PCF Methodology

Data Categories

- 4 data categories exist for collecting foreground and background data
- For the **foreground system, primary data shall be used**
- For each data source, data quality has to be assessed
- Note: Primary data not necessarily must have the highest quality or precision!



Joint UEIL/ATIEL PCF Methodology

PCF Calculation

- "According to ISO 14067:2018, **partial PCFs** shall take into account **fossil and biogenic GHG emissions and removals, as well as GHG emissions and removals from direct land use change** (dLUC) …
- "the following **characterization factors** shall be applied to consider sources and sinks of biogenic and direct land use change greenhouse gas emissions:"

Sum of $PCF_{partial} = PCF_{partial,fossil} + PCF_{partial,biogenic} + PCF_{partial,dLUC}$

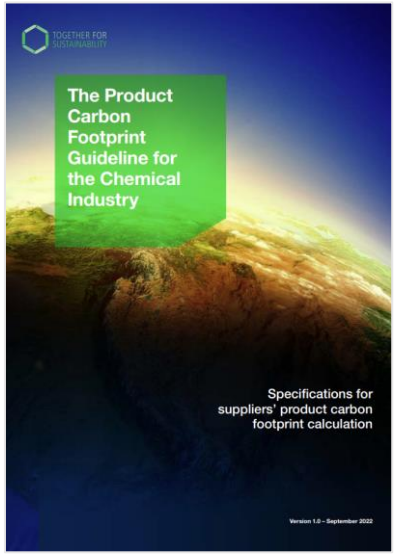
- $PCF_{partial,fossil}$ including only fossil GHG emissions/removals in kg CO_{2e}/kg lubricant or other speciality.
- $PCF_{partial,biogenic}$ including only biogenic GHG emissions/removals in kg CO_{2e} /kg lubricant or other speciality.
- $PCF_{partial,dLUC}$ including only GHG emissions/removals occurring as a result of direct land use change (dLUC) in kg CO_{2e}/kg lubricant or other speciality.

- -1 kg CO_2eq./kg CO_2 for biogenic CO_2 uptake
- +1 kg CO_2eq./kg CO_2 for biogenic CO_2 emissions
- -1 kg CO_2eq./kg CO_2 for CO_2 stored in biomass stock or soil
- +1 kg CO_2eq./kg CO_2 for CO_2 released from biomass stock or soil

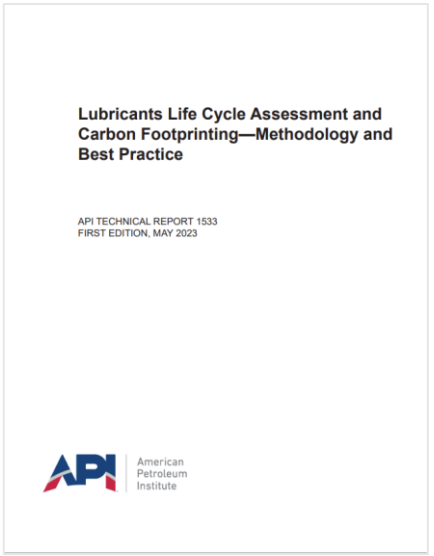
Product Carbon Footprint and Life Cycle Assessment

Product Carbon Footprint methodology for the Lubricants Industry (**UEIL/ATIEL**)

Product Carbon Footprint Guideline for the Chemical Industry (**TfS**)



Lubricants Life Cycle Assessment and Carbon Footprinting – Methodology and Best Practice (**API**)



Cradle to gate

Cradle to gate

Cradle to grave

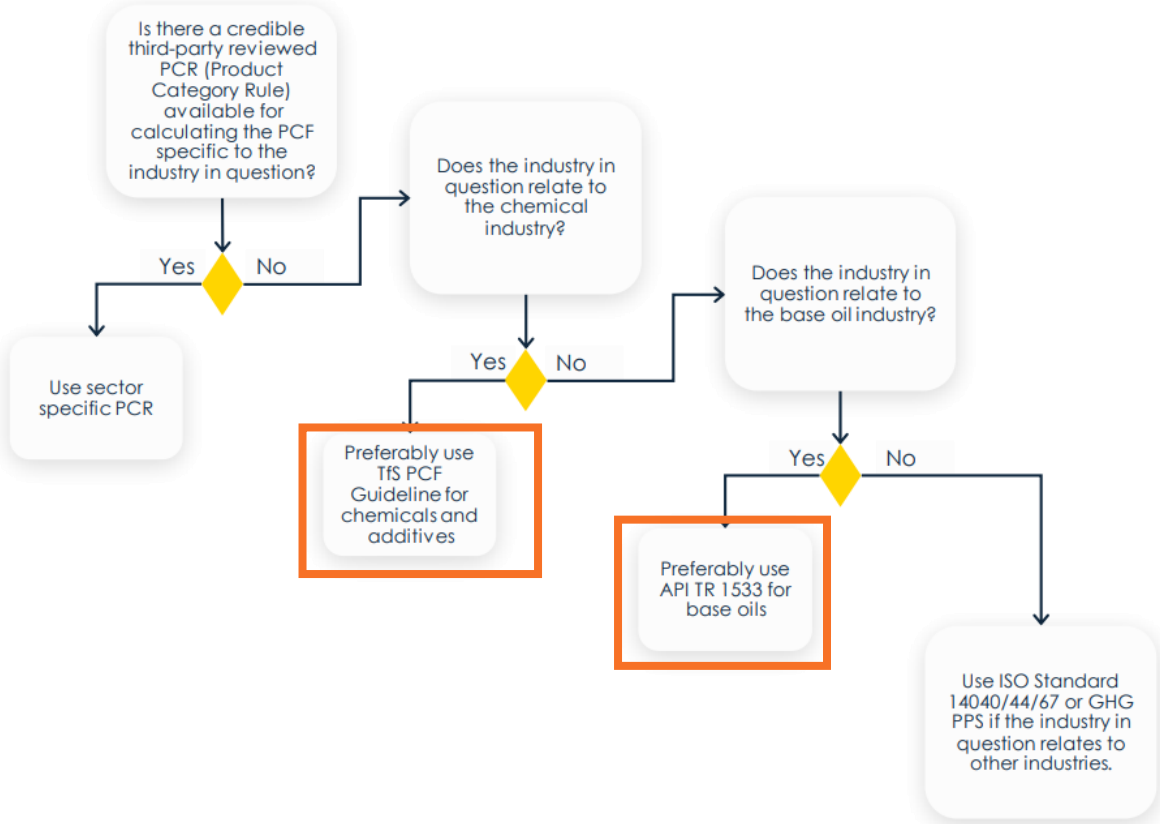
Product Carbon Footprint methodologies of downstream industry sectors using lubricants

We are not alone…is this a problem?

No. UEIL and ATIEL believe that every sector knows best how to assess PCF

Suppliers to the lubricant industry can also have links to other industries, such as the base oil and fine chemical industries and will be asked to supply PCFs for their products to enable the calculations by the lubricant industry.

Therefore, this methodology accepts PCFs that have been calculated based on other methodologies according to their latest version for a cradle-to-gate system boundary in the following hierarchy:



We are convinced that it is in the best interest of the industry that we do not COMPETE on methodologies but rather accept that different sectors might need slightly different approaches.

Harmonization and Endorsement are key!

Where do we go from here?

This is not the end – it is rather the beginning!

Cooperation

- UEIL/ATIEL are committed to align with lubricant associations around the globe on PCF-Methodology, but not limited to!
- We would welcome a PCR for refinery products
- **We invite other lubricant associations to make use of our PCF-methodology – it is not applicable only for Europe!**

Alignment

- UEIL/ATIEL have analyzed and deliberately accepted methodologies from
  - TfS for Additives and Chemicals
  - API for Baseoils
- **UEIL /ATIEL have started to compare relevant methodologies.**
  - Non-binding, nor exhaustive
  - When ready, the comparison will be published as a white paper
- We strive for dialogue with other leading sectoral PCF-methodologies: TfS, Catena X-Rulebook.

Improvement

- UEIL/ATIEL are committed to further develop the methodology and adapt to the trends in the industry
- **We want to support our members with helpful tools and guidance on how to get started**
- We scan the market for recommended data sources specific for the lubricant industry

Global Coordination and Collaboration

International Lubricants Sustainability Liaison Group

Shared Priorities

- Product Carbon Footprint
- Avoided Emissions
- End-of-Life

Future collaboration

- Downstream industry sectors using lubricants

PCF – in a nutshell

WHY do we need a lubricants sector specific standard methodology?

- ISO 14067 only provides broad framework (not lubricant specific)
- Transparency of PCF Calculation

WHAT does it describe?

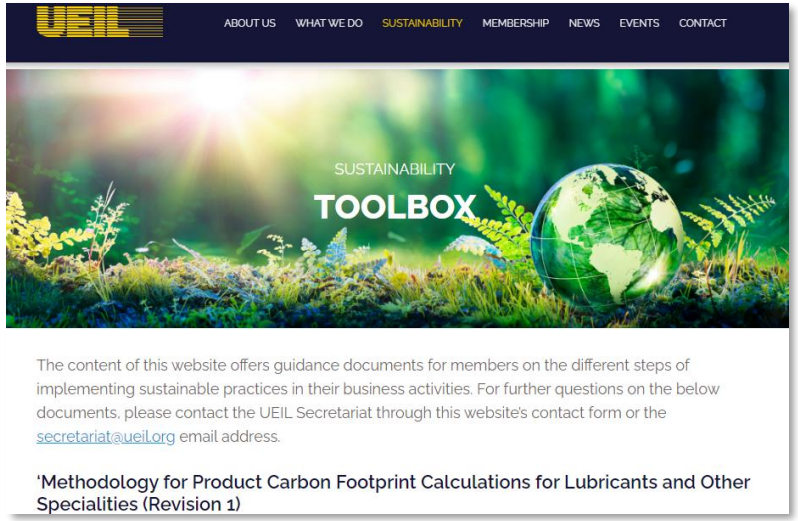
- Scope of PCF calculation (cradle-to-(outbound)gate)
- System boundaries for PCF calculation
- How the PCF should be calculated
- How the PCF should be reported

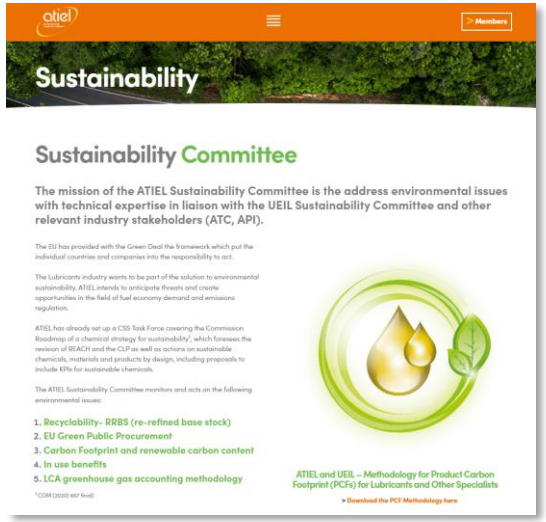
HOW does it help the lubricants industry?

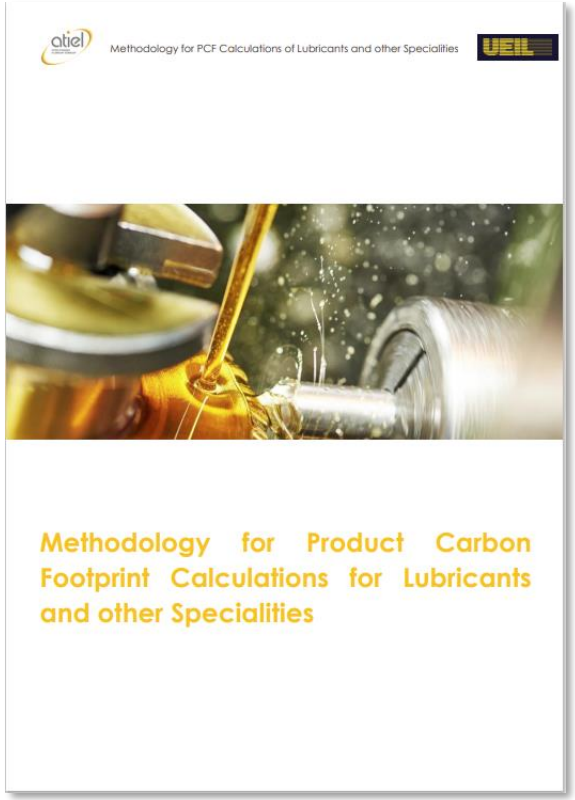
- Transparency → 3rd party reviewed
- Harmonization → ONE methodology
- Pressure on stakeholders → ONE voice

Feel invited

To make use of the PCF Methodology – for free!
Download from **www.ueil.org** or **www.atiel.eu**







Thank you

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