



Product Carbon Footprint: l'esperienza di Infineum nella filiera dei Lubrificanti

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Performance you can rely on.



Presentation Outline

- Some observations on product carbon footprint methodology in the lubricant industry
- Some reflections on the need for mass balancing approach
- A couple of examples of what is possible to achieve today in the lubricant supply chain

Process:

- Presentation about 20 minutes
- Q&A about 10 minutes

LCA / PCF at Infineum: in house capability & tool

LCA / PCF work at Infineum started in 2018/19

In-house **LCA expertise** and dedicated resources

Not just carbon footprinting, but life cycle assessment (i.e. all relevant environmental impacts)

- current focus on PCF

Ability to produce cradle-to-gate LCAs/PCFs of **each Infineum product** by site

- approximately 300 intermediates
- approximately 1,000 additive packs / products
- as well as off-site production (toll manufacture)

Dedicated LCA software tool, LCA for Experts, produced by Sphera

Aligned with relevant standards and guidelines



LCA / PCF at Infineum: an ongoing effort

Supplier engagement programme launched

- **key supplier outreach** commenced in 2020, continuous wider roll-out
- dedicated **sustainability questionnaire** shared with suppliers
- continuous supplier engagement and **progress monitoring**

Not a one off: we need **updating and refining** our LCA model

- **incorporate further detail**, fx incorporate supplier-specific data
- enable more **scenario analysis**
- **optimise data collection** and management
- To do: **Further automation**



What do we use it for?

We use LCA / PCF for

- Internal decision-making to
 - identify 'hotspots' in our cradle-to-gate value chain
 - evaluate alternatives, e.g. in raw material choices
 - set internal targets at business function level
- supporting decision-making at customers

...being mindful of the limitations

- accuracy of data, of assumptions, of outlook
- comparability, of raw material supplier PCF data
 - industry efforts will ensure methodology alignment
 - different data sources may still mean differences
 - current options vs future plans



Standards, Guidelines & Best Practice

General standards

- **ISO standards** set the general requirements and guidelines
 - ISO 14040 & 14044 for LCA; ISO 14067 for PCF
- GHG Protocol has also produced a standard for PCF

Sector guidelines

- API has developed a **Technical Report, TR 1533**, on best practice for PCF calculation of finished lubricants
- UEIL / ATIEL has developed **methodology for PCF Calculations of Lubricants and other Specialties**
- Additive industry, via ATC, has endorsed the Together for Sustainability (TfS) PCF Guideline for the Chemical Industry
 - Encouraging suppliers to also use TfS PCF Guideline



PCF Methodology – Main Issues and Challenges

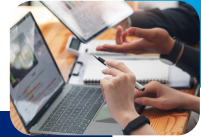
Methodology alignment – ensuring global alignment

Comparability – numerous factors affecting comparability (methodology, data sources), so carefully review needed

Supplier-specific data – moving away from secondary data towards primary data across the full value chain

Data exchange – electronic PCF data exchange across value chains

Decarbonisation – showing decarbonisation progress when there are so many moving parts



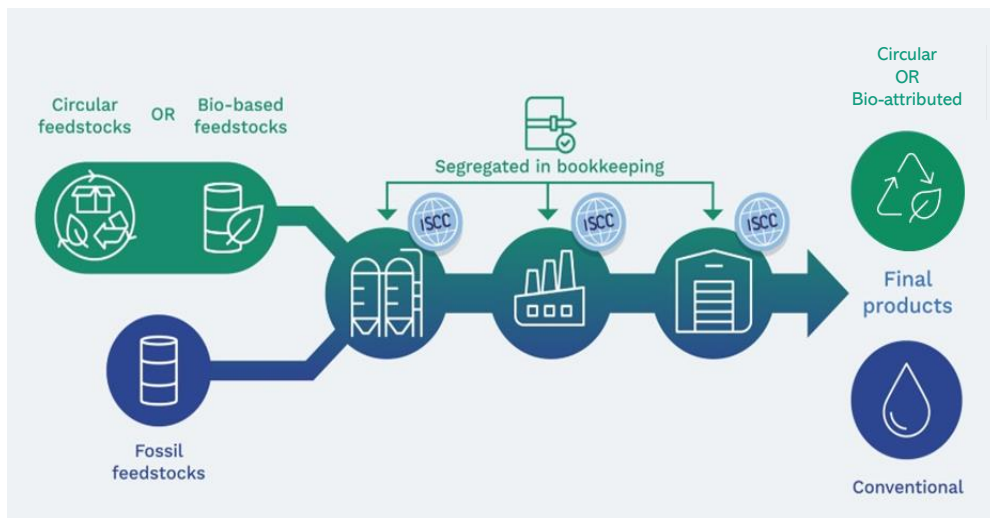
Mass Balance Approach

Enables Acceleration of Decarbonisation in Our Value Chain



What is Mass Balance Approach?

A certified chain of custody accounting method that allows manufacturers to a) mix sustainable materials with conventional materials using existing infrastructure and b) assign sustainable attributes to selected final products, thus creating sustainability value.



Key Benefits

- ✓ Affordability
- ✓ Quality
- ✓ Flexibility
- ✓ Traceability
- ✓ Efficiency
- ✓ Assurance

Challenges

- Relatively new in lubricant value chain
- Complex if not set up properly

Infineum Mass Balance Activities in 2024:

- Mass Balance pilot with key supply chain partner
- Infineum aims to acquire ISCC Plus Certification at Vado Plant by the end of 2024

By gradual introduction of sustainable feedstocks into our products we can provide our customers and OEMs with lower carbon solutions at a more affordable cost.

Additives Product Carbon Footprint (PCF) – What is possible today

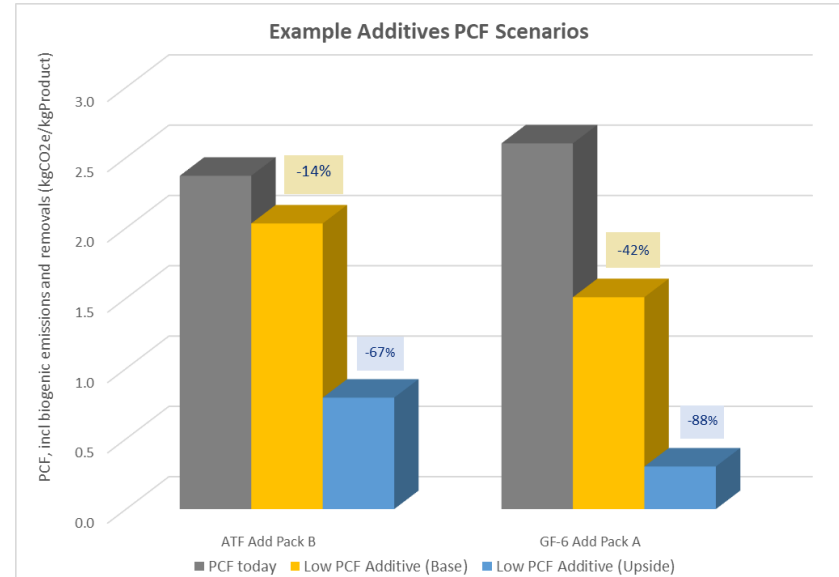
Working on our supply chain, we considered which levers we can pull to deliver lower carbon solutions to the industry. These are just examples based on two formulations, but they can be a good illustration of what is possible.

We defined two scenarios:

- **Base Case:** Realistic PCF reductions based on confirmed circular and bio-feedstock options (**PCF reductions of up to ~ 42%**)
- **Upside Case:** Potential PCF reductions (**PCF reductions of up to ~ 88%**)

Infineum Additives PCFs			
Scenarios	PCF Today	Base Case	Upside Case
ATF Add Pack B	2.4	2.0	0.8
GF-6 Add Pack A	2.6	1.5	0.3

* PCF data is estimated and included bio-genic emissions and removals



Finished Oil Carbon Footprint – What is possible today

Because of its treat rate, base oil is a major contributor to carbon footprint of the lubricant, followed by additive pack and viscosity modifier.

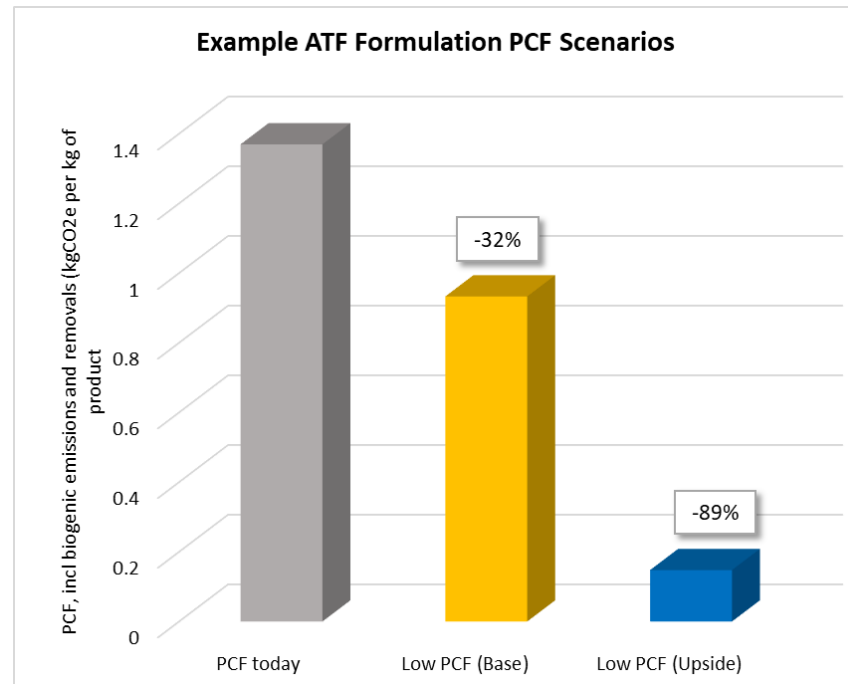
Incorporating more renewable base oils (RRBOs/BBBOs), combined with lower PCF additive packs and VMs, using circular and bio-based options is a key priority for lubricants industry

The table and graph represent an example of ATF finished oil formulation

- *Base Case: Up to 32% PCF reductions*
- *Upside Case: Up to 89% PCF reductions possible*

ATF Finished Oil PCF Scenarios			
	PCF Today	Base Case	Upside Case
PCF Total	1.4	0.9	0.1

* PCF data is estimated and included bio-genic emissions and removals



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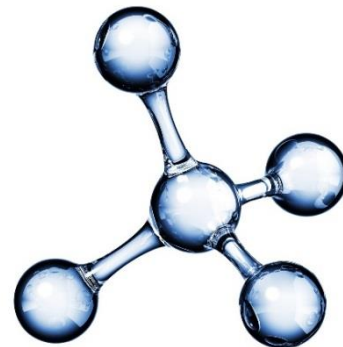
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Annex



LCA/PCF Optimisation – Infineum Thoughts and Observations

Make **full use of the software** you choose

- choose software based on your needs
 - LCA vs PCF
 - specialised software vs enterprise solutions
- **make use of databases** for covering upstream processes
 - raw material production, energy generation, transport, etc.

Ultimately, link with your **data management system**

Accept that **implementation takes time**

Accept that it is an **iterative process**

- continuous improvement and optimisation



Align with standards and guidelines

Identify your 'hotspots' (where the main impact of your products occur)

- use these for focusing data refinement

Engage your suppliers

- set up a dedicated supplier engagement programme
- identify your main suppliers and focus on them to start
- make expectations clear, understand implications

Account for uncertainties in decision-making

