



Carbon Footprint

A Piece of the Puzzle in Grease Sustainability





Target insights?

- Aspects influencing sustainability
- Relation between use and sustainability impact
- How to use insights

Incentive



Our industry:

- + Fights friction
- + Prolong equipment life
- = Supports sustainability!

Can we up our game?

Product Carbon Footprint

PCF Measurement Scope

- PCF measures cradle-to-gate emissions but excludes use-phase impacts like contamination and energy efficiency.

Environmental Contamination Risks

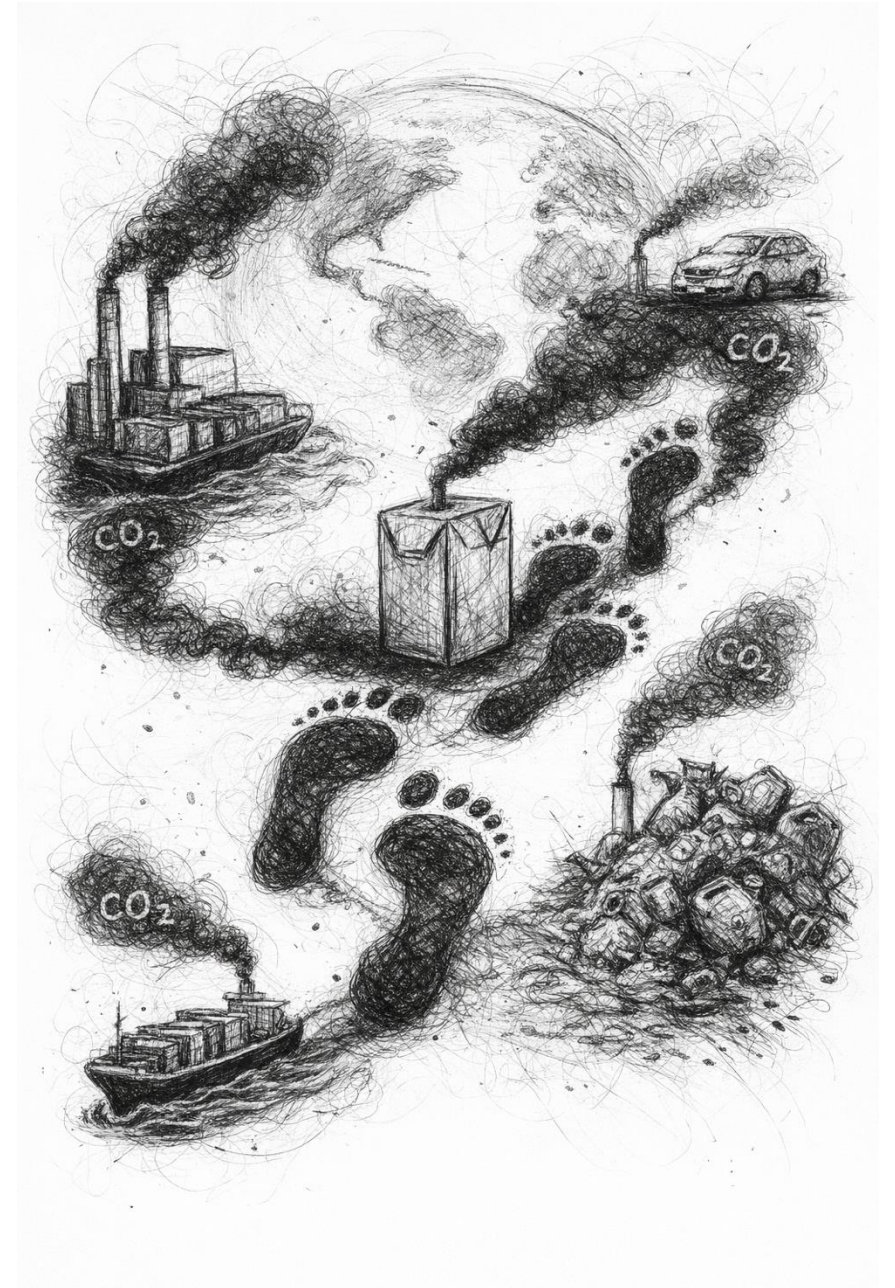
- Low PCF grease can still be toxic or non-biodegradable, posing serious contamination risks in ecosystems.

Operational Benefits Consideration

- Greases with higher PCF may reduce friction and downtime, providing net positive sustainability outcomes.

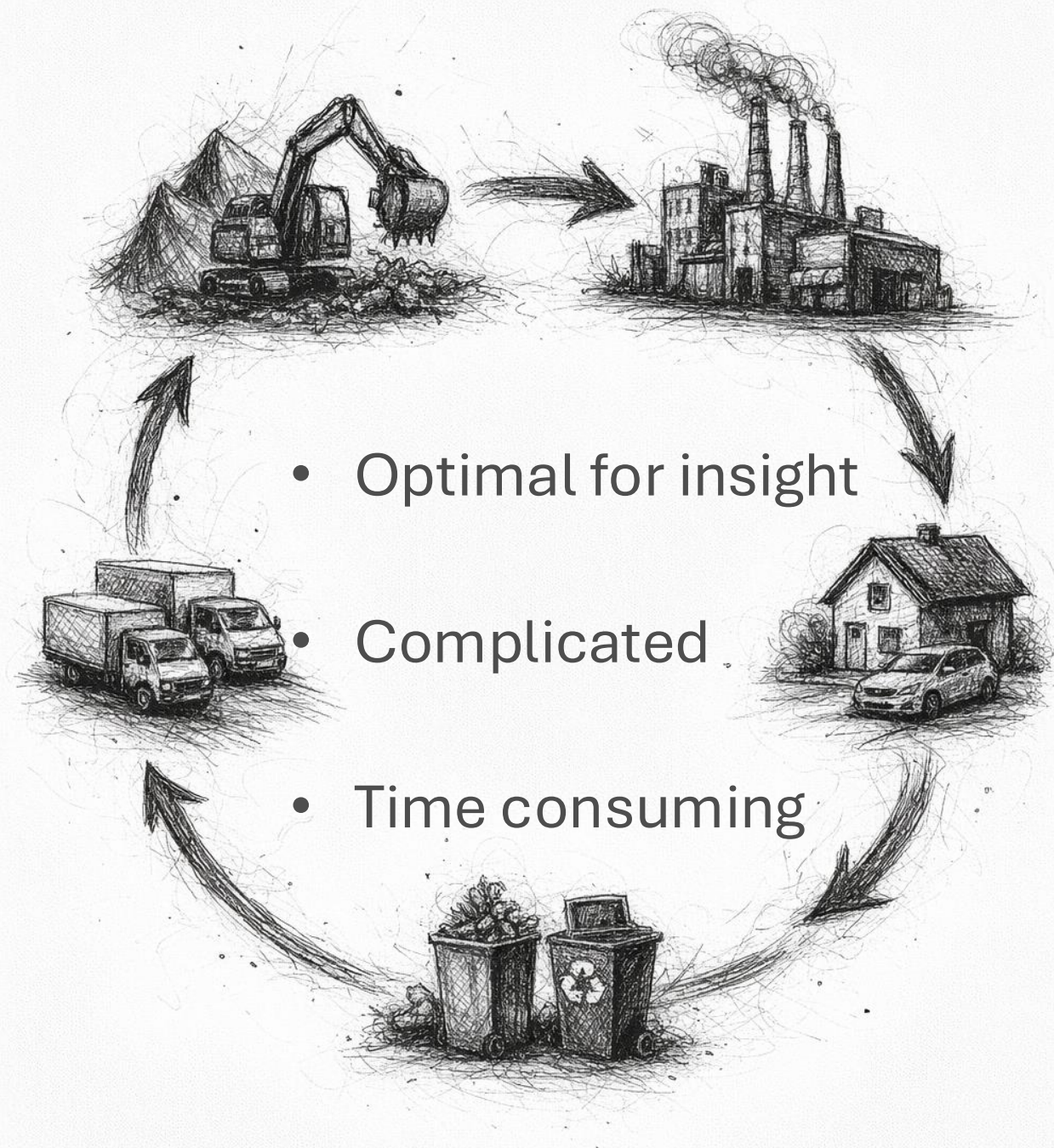
Need for Multi-Dimensional Evaluation

- A holistic approach is essential, balancing contamination risk, climate impact, and operational benefits.



LCA

- Feedstocks
- Processing
- Formulation
- Application
- Disposal
- Transports
- (Reuse)



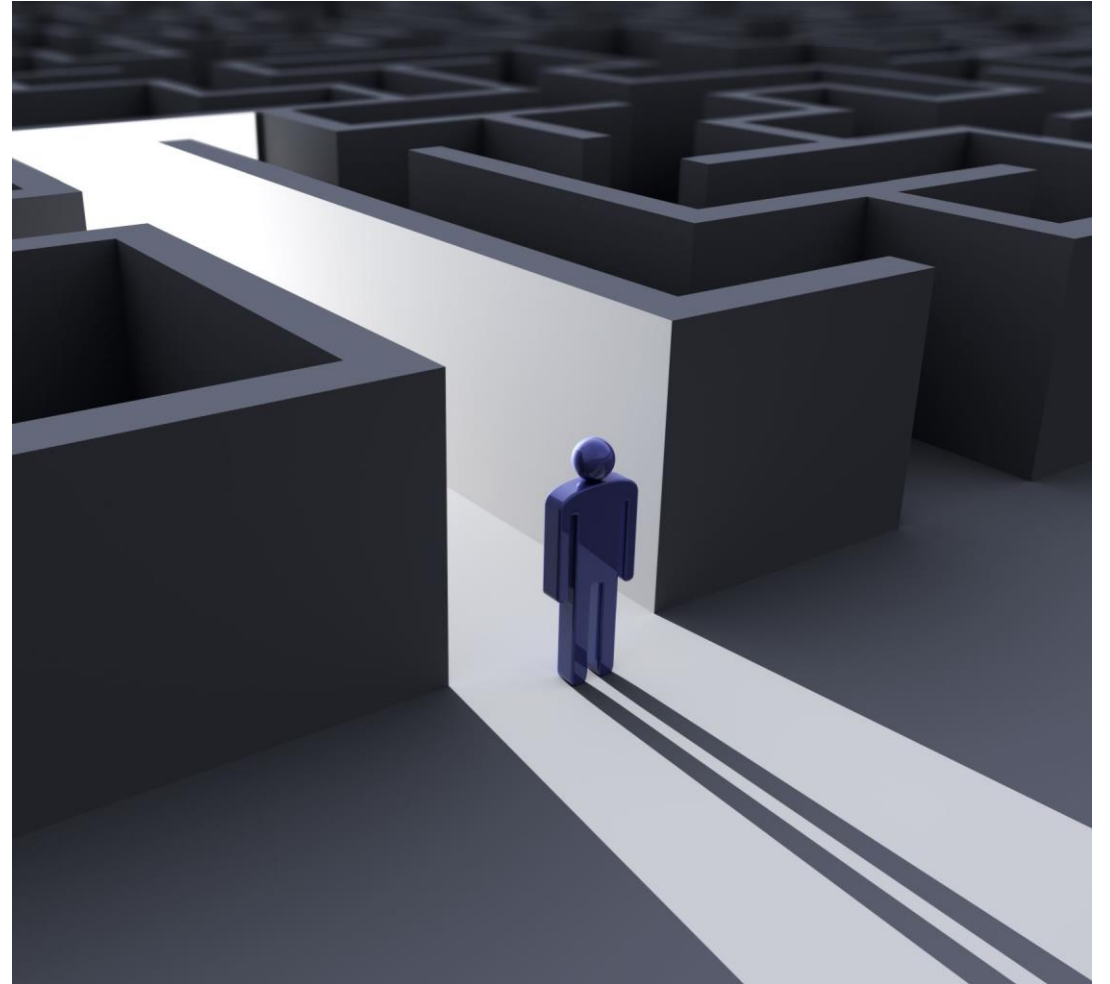
Valid claims?



- **Recycled content:**
 - “This product is manufactured using 28% recycled packaging, verified under the EU Green Claims Directive.”
- **Bio-based content:**
 - “Formulated with 62% bio-based components, measured according to EN 16785-1.”
- **Reduced carbon footprint:**
 - “Lifecycle CO₂e emissions reduced by 14% compared to our 2020 reference grease, based on ISO 14067 analysis.”(Supports lifecycle substantiation requirements.)
- **Biodegradability:**
 - “Readily biodegradable (≥60% in 28 days) according to OECD 301B.”
- **Durability benefits:**
 - “Extended relubrication interval by 35%, reducing grease consumption per operating hour.”(An environmental improvement through efficiency—allowed if measurable.)

The challenge

- Formulations in use
- Applications in target
- LCAs will take time...
- What can we do now?



Why a puzzle?



Total loss



High consumption



Long life

Why a puzzle?



Total loss

In total-loss applications, grease is lost to the environment making contamination risk the primary sustainability concern.



High consumption

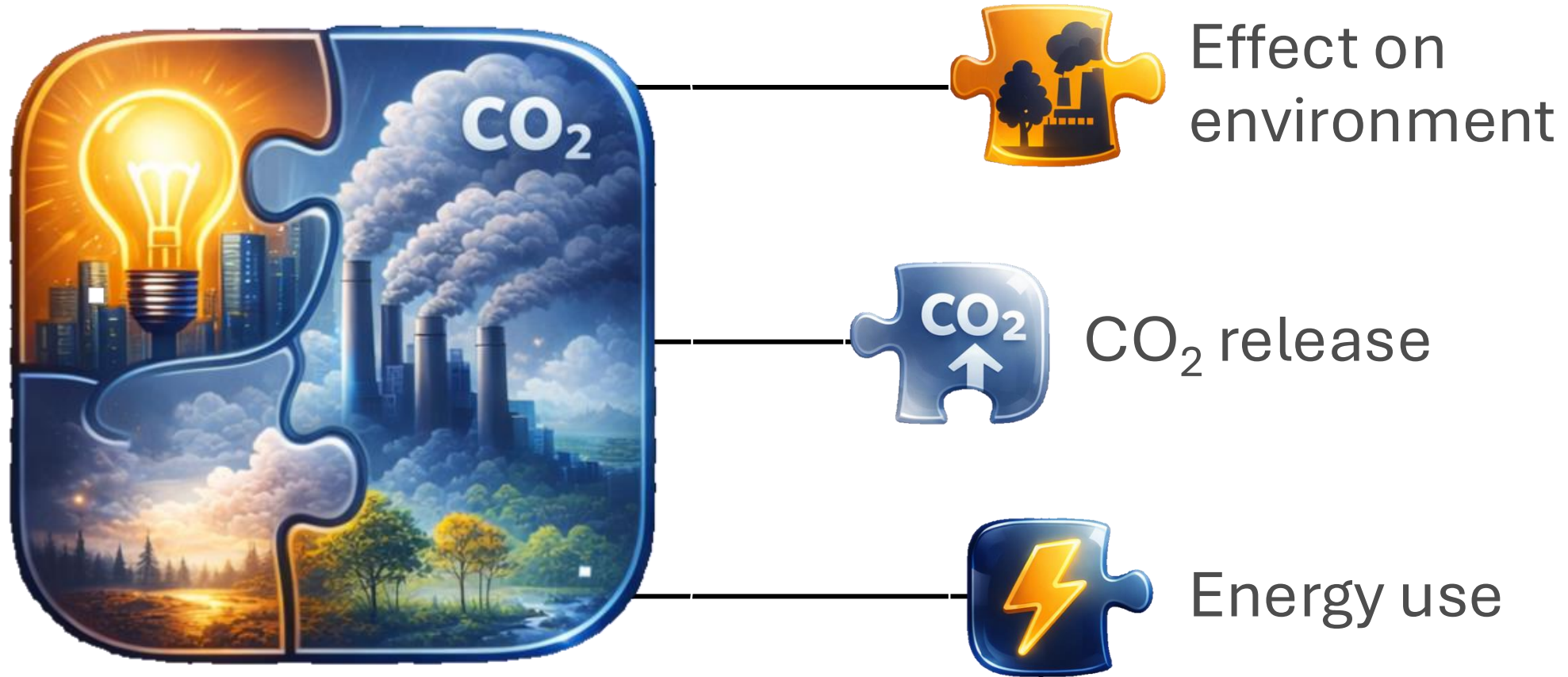
High-consumption applications use large grease volumes collected for disposal, focusing on carbon footprint and energy efficiency.



Long life

Long-life applications keep grease in place long-term, emphasizing friction reduction and operational reliability.

Sustainability?



Application assessment

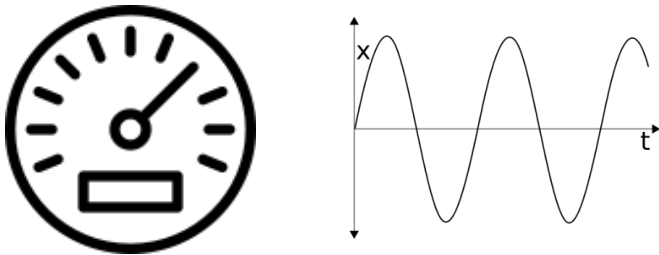
Component:



Operating environment:



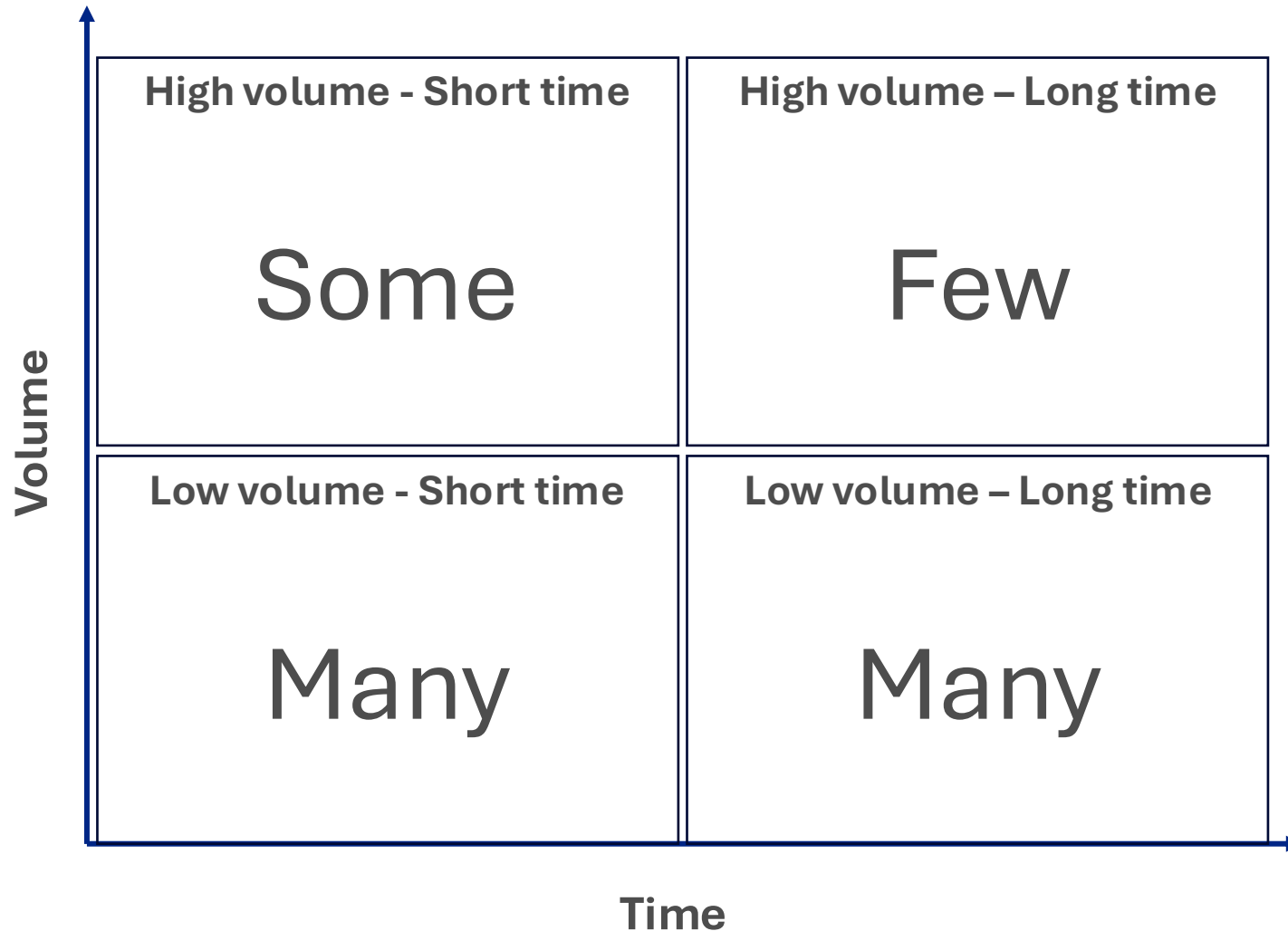
Running conditions:



Requirements:



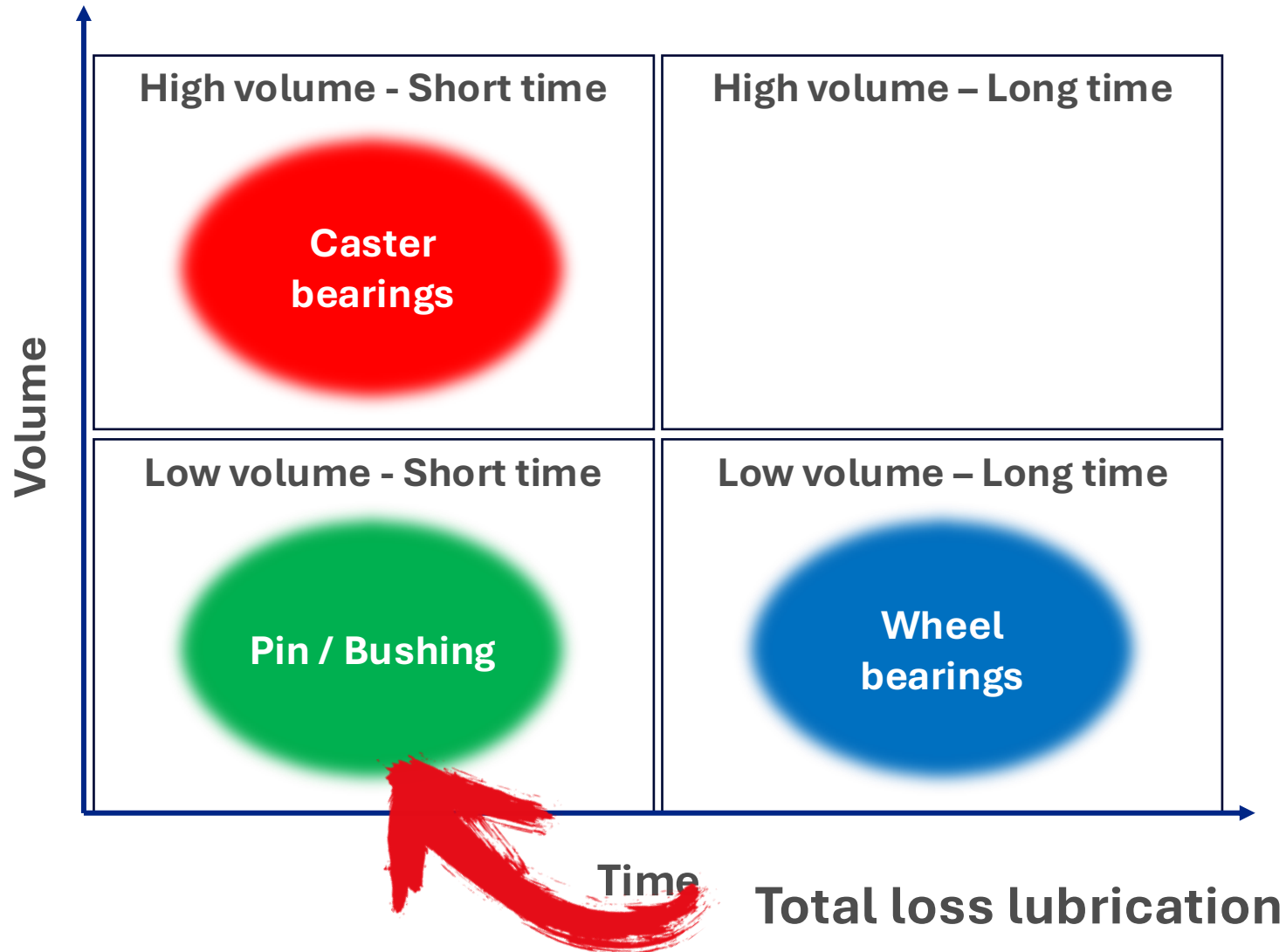
Applications



Influencing sustainability:



Applications



Influencing sustainability:



Main influences



Effect on environment

- Loss ratio
- Consumption
- Hazard level



CO₂ release

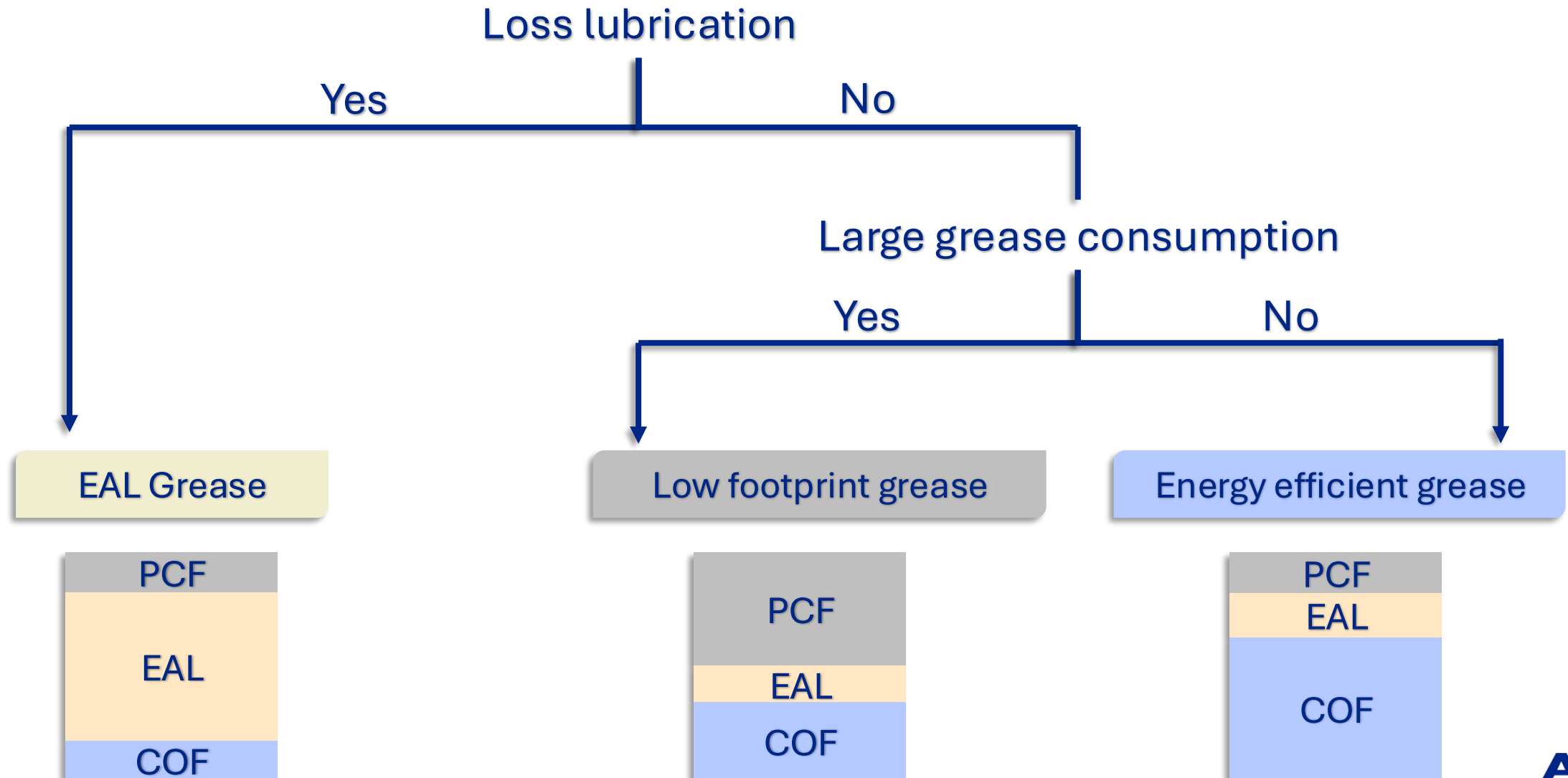
- Consumption
- PCF
- Power



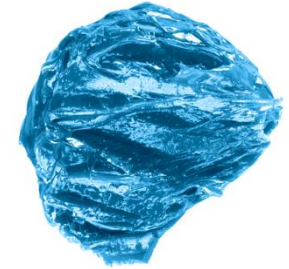
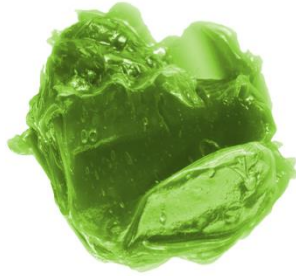
Energy need

- Power
- Time
- Workload

Choosing a sustainable grease



3 Grease example



Effect on:

Environment (rating: 0 – 10)

CO₂ release (rating: 0 – 10)

Energy use (rating: 0 – 10)

EAL

1

4

5

Low PCF

5

1

4

Low friction

7

2

1

Start laying the puzzle



Total loss

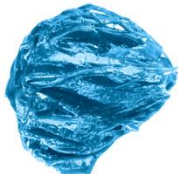
Environment
CO₂ release
Energy use



EAL



Low PCF



Low Friction

High volume

Environment
CO₂ release
Energy use

EAL

Low PCF

Low Friction

Long life

Environment
CO₂ release
Energy use

EAL

Low PCF

Low Friction



Take aways

- Consumer & customer demands
- Regulatory restrictions
- Performance benefits
- Cost incentives
- Environmental benefits & reputation
- Require knowledge and implementation!



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