

# RRBO quality - perception vs reality

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# We exist to create a sustainable future through innovative chemistry



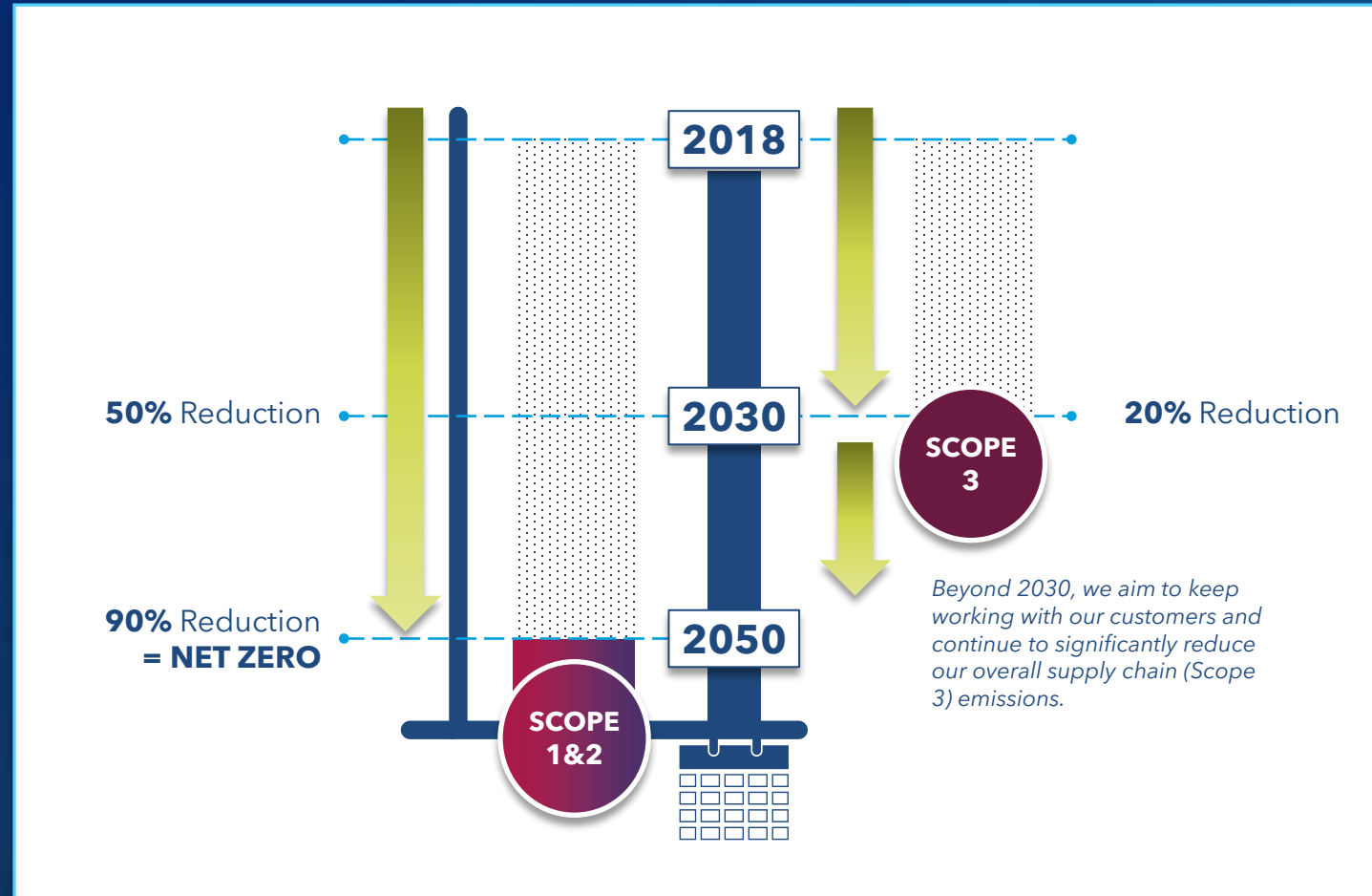
We are a Specialty Chemicals Company with powerful research and development capabilities around innovative chemistry which has a vital role to play in sustainability.

## By 2050, our ambition is to reach Net Zero.

This is equivalent to a **90% reduction** in GHG emissions for operated assets



*The extent of ultimate achievement of these ambitions could vary depending on various factors, including Infineum's ability to execute operational objectives, supportive changes in laws and regulations, and other market factors.*



# Infineum's key areas of focus for Lubricants



**Cradle to Gate Base Oil LCA**  
(kg CO<sub>2</sub> / kg Base Oil)

0 0.5 1 1.5 2

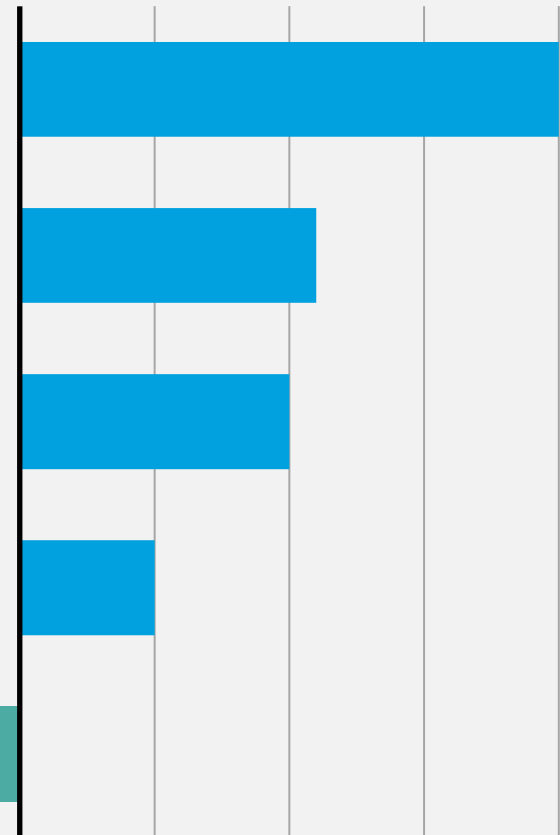
**Conventional Synthetic (PAO)**

**Conventional Mineral Oil (Grp III)**

**Conventional Mineral Oil (Grp II)**

**Re-Refined Base Oil**

**Bio-Based Base Oil**

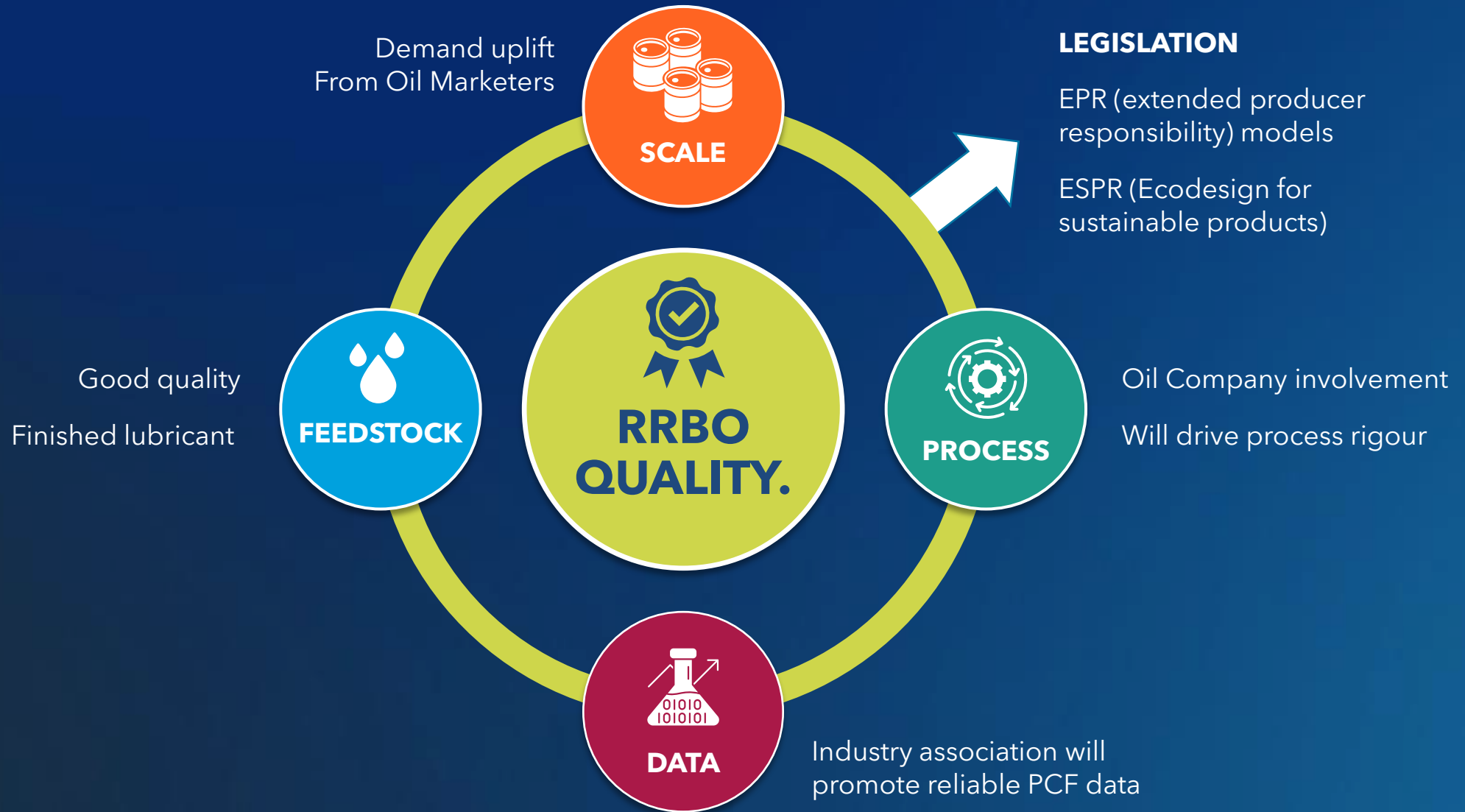


1. Optimised fuel economy
2. Robust hardware durability, even at low viscosity
3. Long drain oil with exceptional oxidation resistance, No compromise on engine durability
4. Lubricants for hydrogen as future fuel
5. Hybrid vehicle solutions
6. BEV Fluids
7. Incorporating more sustainable base oils in future formulations is a key priority for reducing the cradle-to-gate carbon footprint
  - Reducing PAO content
  - Utilisation of re-refined base stocks
  - Including base stocks from renewable sources

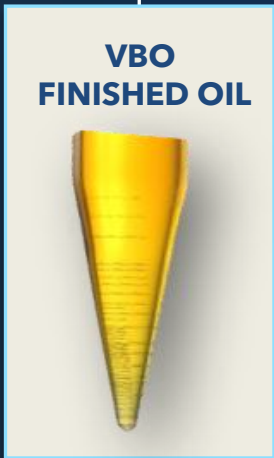
# RRBO Quality - Perception



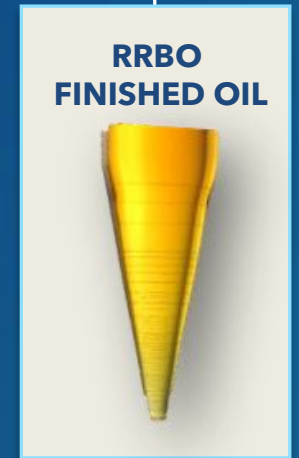
# RRBO Quality - Reality



# Prove Through Testing



API ALIGNMENT (CRUDE OIL DERIVED)			
Group	I	II	III
Sulphur	> 0.03%	< 0.03%	< 0.03%
Saturates	< 90%	>90%	>90%
Viscosity Index	80 - 120	80 - 120	>120



BASE OIL, ADDITIVE AND FINISHED OIL STRESS TESTING OVER EXTENDED TIME	
Colour	- ASTM D1500
Sediment	- static stability and particle counting
Metals	- ICP



**RRBO is an acceptable component for use** in automotive additives and lubricants providing due diligence is carried out to avoid downstream harms

# Key Instruments to promote RRBO penetration

## - Mass Balance (chain of custody)



- A mechanism enabling companies to assign certified, sustainable attributes to those entities who value them
- Enables investment in circular content



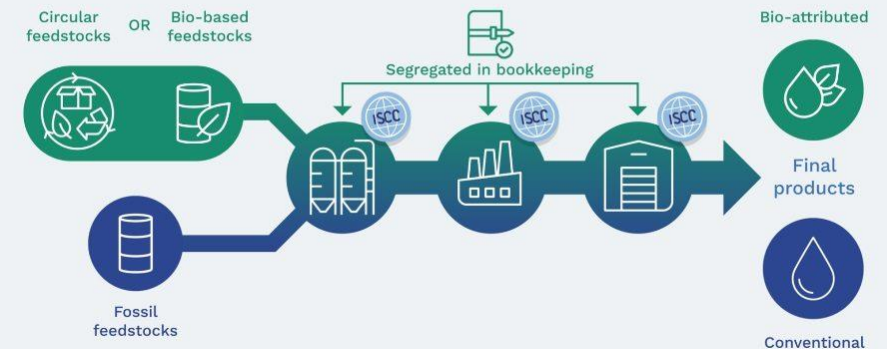
### Advantages

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

### Disadvantages

- Complex if not set up properly

### INFINEUM SUPPORTS THE ISCC PLUS CERTIFICATION



**To create trust within lubricants value chain, latest technology, solid models and certification options must be employed.**

# Conclusions



**RRBO** is a logical route for the lubricant industry to embrace the circular economy



Despite concerns on consistency and quality, rigorous testing has demonstrated that most **RRBO is suitable for use in additive and lubricant formulations**



**EPR** and **ESPR** legislation are key drivers to support RRBO implementation



Mass balance is key enabler for securing RRBO investment particularly in the additives sector



Lubricant marketers partnership / investment in RRBO suppliers will further support quality





# Questions?

Performance you can rely on.



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