



copper technologies

It's time for change.

Rejuvenates •

CuGlide

New Chemistry

No-Wear

Life Extension

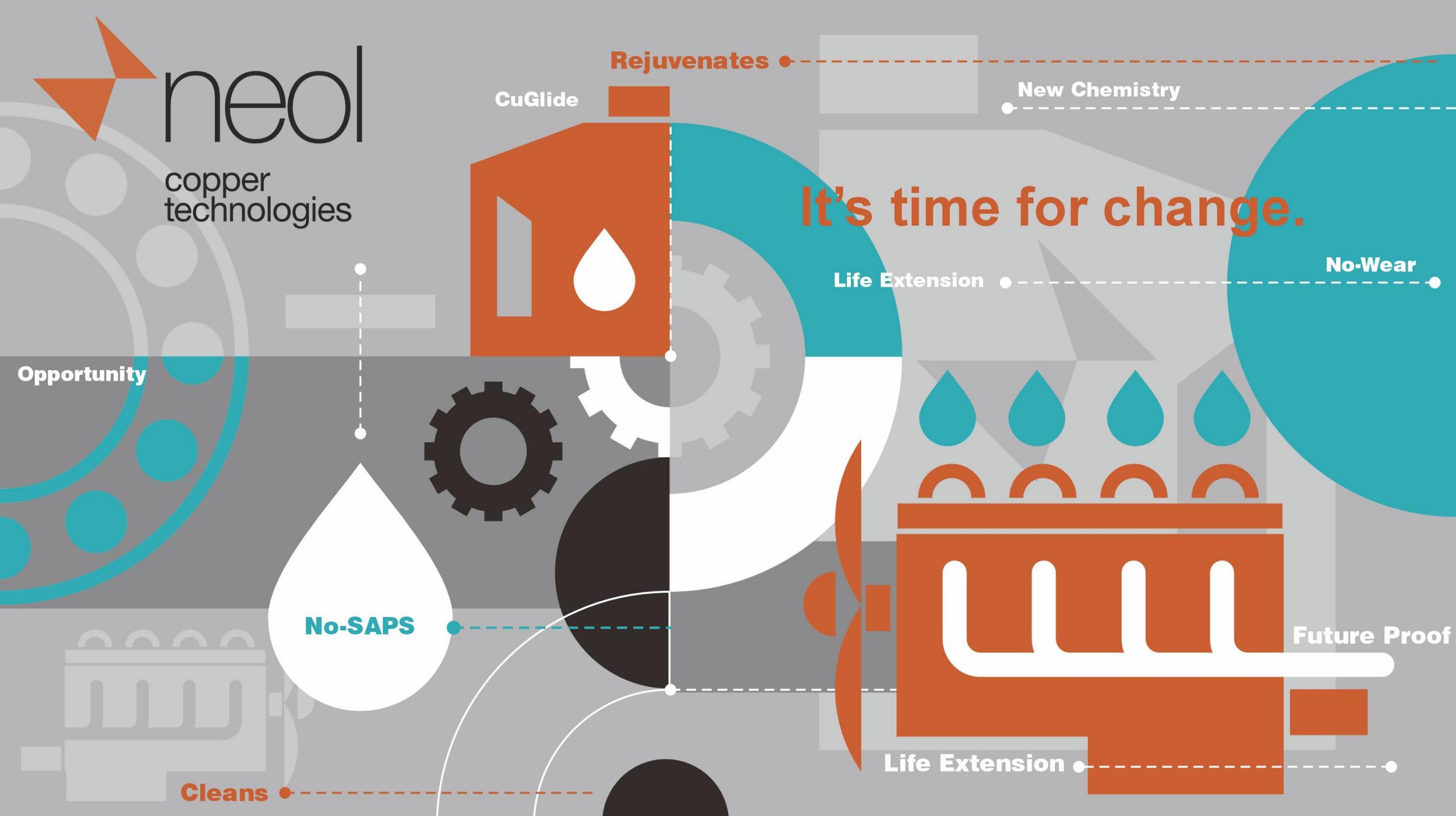
Opportunity

No-SAPS

Future Proof

Life Extension

Cleans •



Executive Summary

- GBP5m early-stage investment opportunity in a ground-breaking transformative technology within the USD165b global Lubricants industry.
- Neol Copper Technologies Limited is a UK hard-science company developing, testing and manufacturing new generation technical lubricants based on its proprietary patented additive technology (CuGlide™), providing users with higher level of both mechanical efficiency and sustainability at no extra cost.
- CuGlide™ is a proven and patented multifunctional component technology with 30 years in R&D and nearly 20 years in application. Neol owns correspondent patents and patent applications.
- Neol's versatile technology and proven product portfolio enable the company to develop both as a clean-tech enterprise focused on sustainable additive solutions, and as a lubricant manufacturer. This dual approach allows Neol to simultaneously generate corresponding enterprise value and operating cash flow.
- Neol is led by an experienced team of entrepreneurs, product managers, engineers and finance professionals.
- With the proceeds from this funding round, Neol aims to achieve its first recurring revenue milestone of GBP 1 million within 12 months and subsequently scale to GBP 200 million in revenue over the next five years, targeting an equity valuation of at least GBP 400 million.

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The Introduction



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The Problem

This truck's fuel efficiency drops by 1.2% every year from its original engineered level due to wear.

Its battery will require replacement around the 150,000-mile mark.

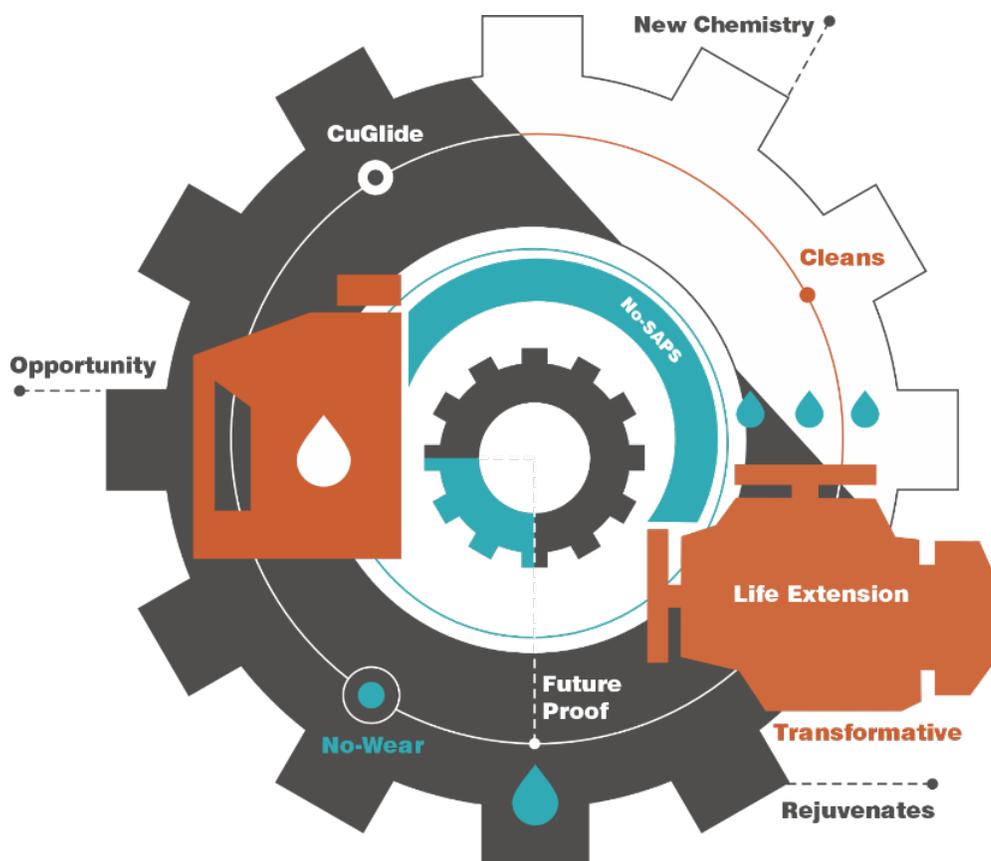
Due to 24/7 operation in extreme conditions the engine of this mining truck wears off and requires major overhaul within 3 years!



In the world of transportation, we are still facing the challenges of **wear, waste, rising fuel consumption and emissions**

How are We Going to Solve the Problem?

By transforming technical lubricants



By revolutionising the lubricants industry

Our ground-breaking technology can **transform the global lubricants industry** in the way it approaches anti-wear of machinery, driving positive change and allowing sustainability at no extra cost.

By aligning sustainability with efficiency

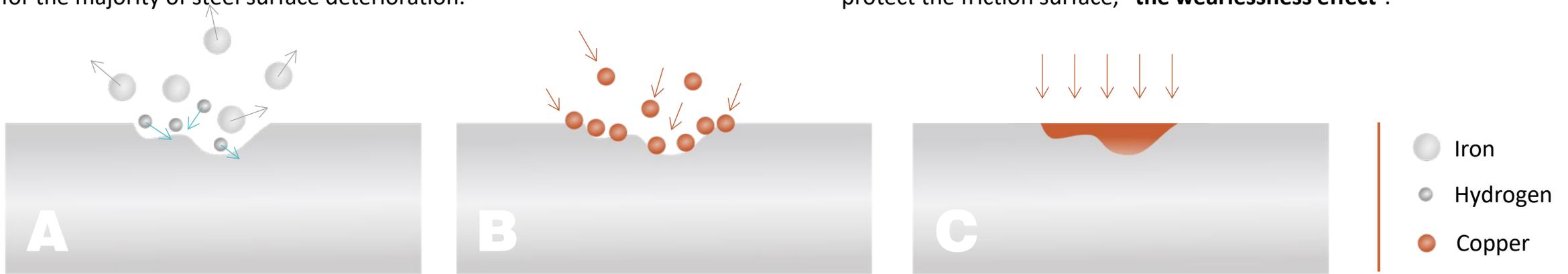
With **CuGlide™** inside, **we produce lubricants with exceptional anti-wear, detergency and fuel efficiency properties**, while being free from harmful sulphated ash, phosphorus, and sulphur (no-SAPS).

Lubricants become SYNOVIAL FLUIDS in metal joints preserving them from wear, failure and loss of efficiency

How Does It Work?

Hydrogen Wear

In the 1950s, engineers discovered that hydrogen was responsible for the majority of steel surface deterioration.



The Wearlessness Effect

Electrochemical properties of copper ions are used to restore and protect the friction surface, “the wearlessness effect”.

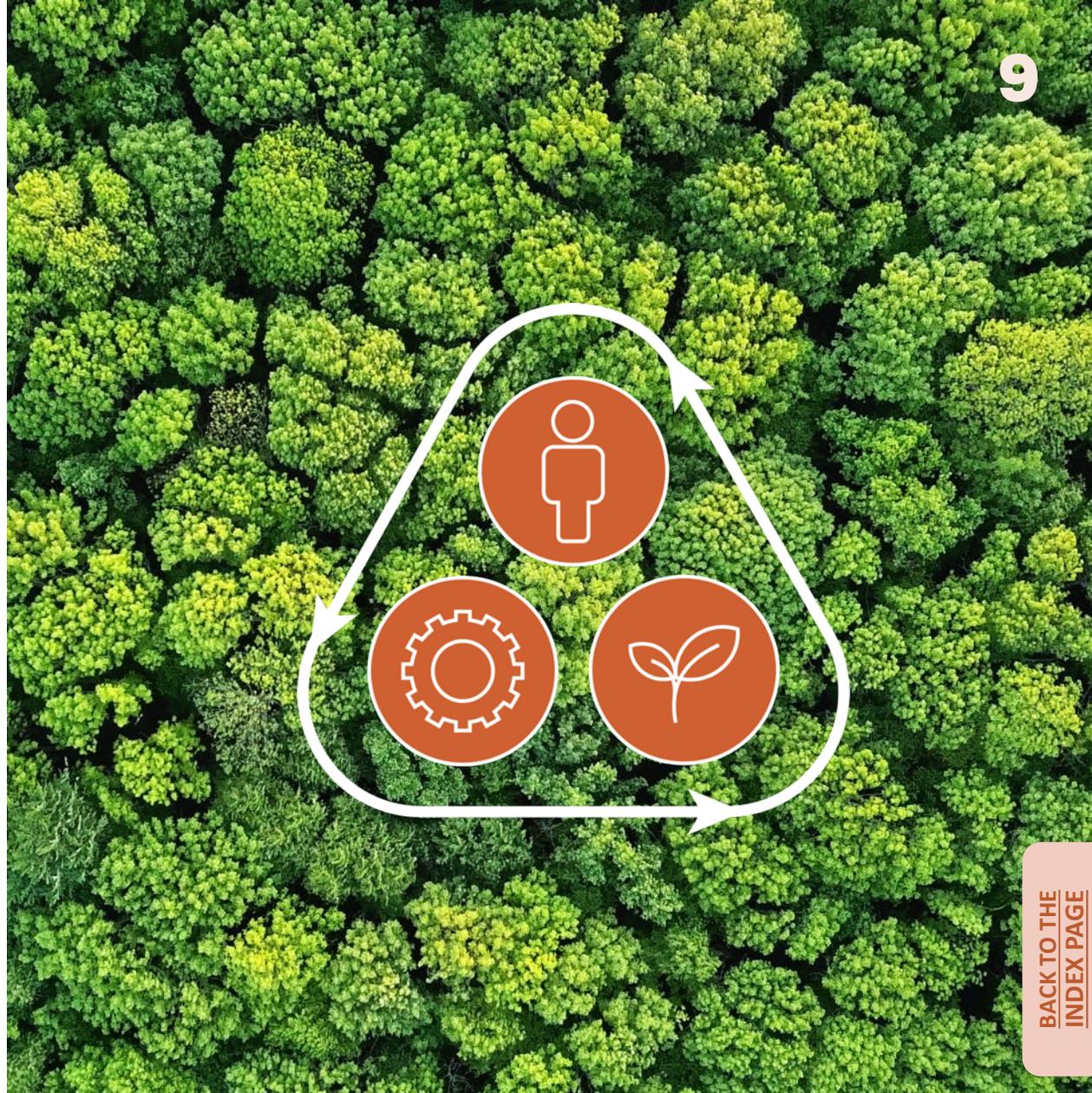
CuGlide™ technology takes advantage of the “**hydrogen wear**” mechanism. Rather than allowing uncontrolled hydrogen invasion of the friction surface, the additive technology first uses its properties to “polish” the friction surface at the elementary level. The hydrogen wear is then terminated with copper ions.

- A.** Hydrogen displaces steel molecules, accelerating the wear of machine parts.
- B.** Copper ions are embedded in the crystal lattice of iron in iron-containing alloys, thereby “healing” damaged areas.
- C.** They gradually form an even copper film covering an entire surface, at which point continued wear virtually ceases.

Our Vision

In today's world, it's crucial for humans, machines, and nature to be **resourceful**. We all strive to achieve our goals and feel confident along the way. But what's even more important is learning how to **preserve the precious resources given to us by nature**.

At NEOL, we deeply understand the value of these reserves, **which is why we create technologies that extend the lifespan of equipment and help protect both natural and human resources**.



Climate Change Context

We have been on the quest to find **THE SOLUTION** – it turns out there is no such a thing

While we are looking for the panacea for the climate change problem, we can't continue treating the wounds by covering them with short-term first-aid plasters.

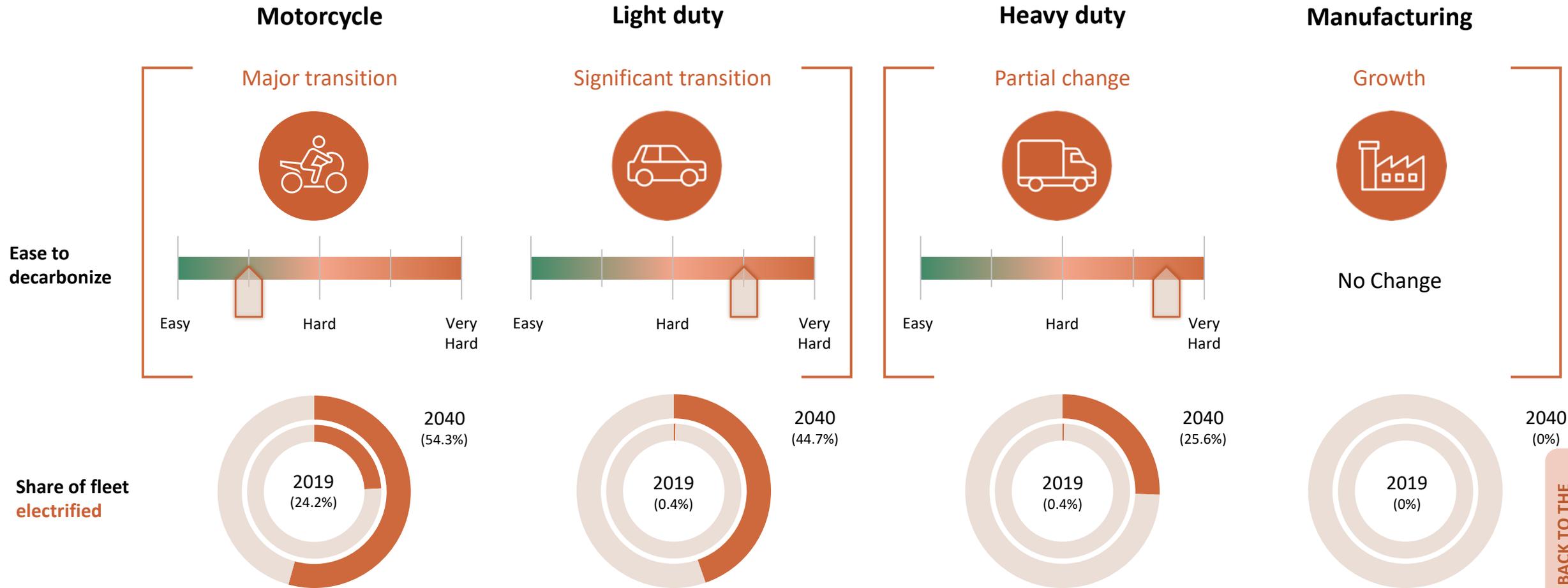
Most of the gasoline- and diesel-powered machines are not going anywhere for the next decades.
But...

Improving the efficiency of 100 heavy CVs by just 1% equates to 110 cars going ICE to BEV



There are **SOLUTIONS** we can implement **NOW**

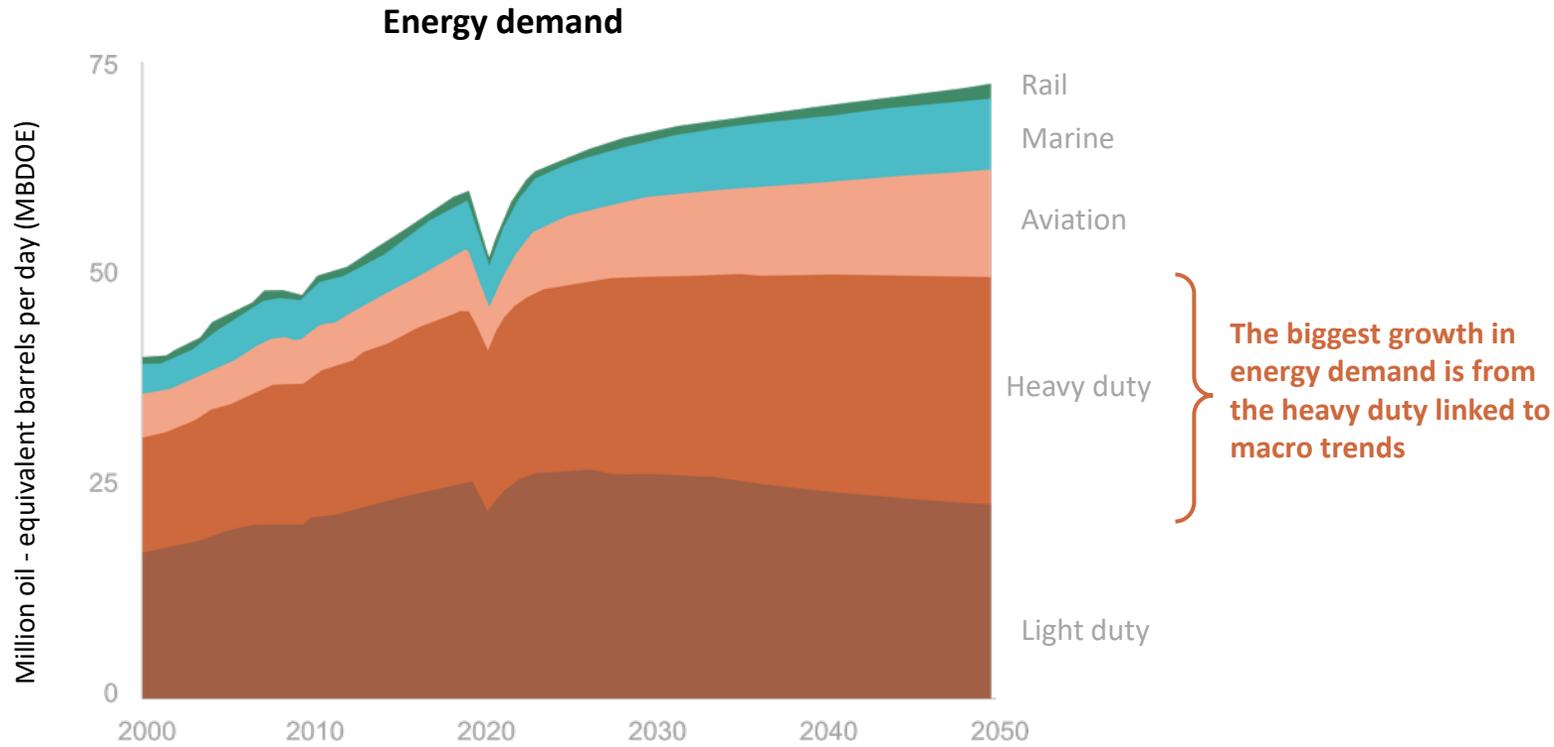
The Energy Transition - Electrification Impact



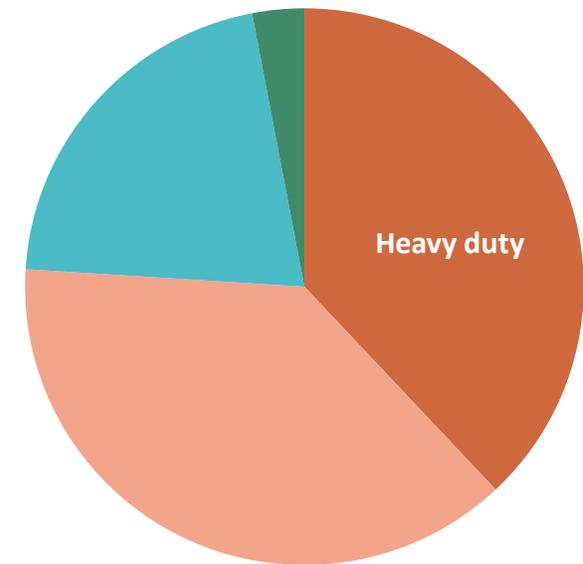
Source: BNET 22-06-01 Long Term Electric Vehicle Outlook 2022 Economic Transition Scenario (ETS).

Multiple paths are required to effectively tackle global decarbonization

Transport Energy Demand by Application



Growth 2021-2050



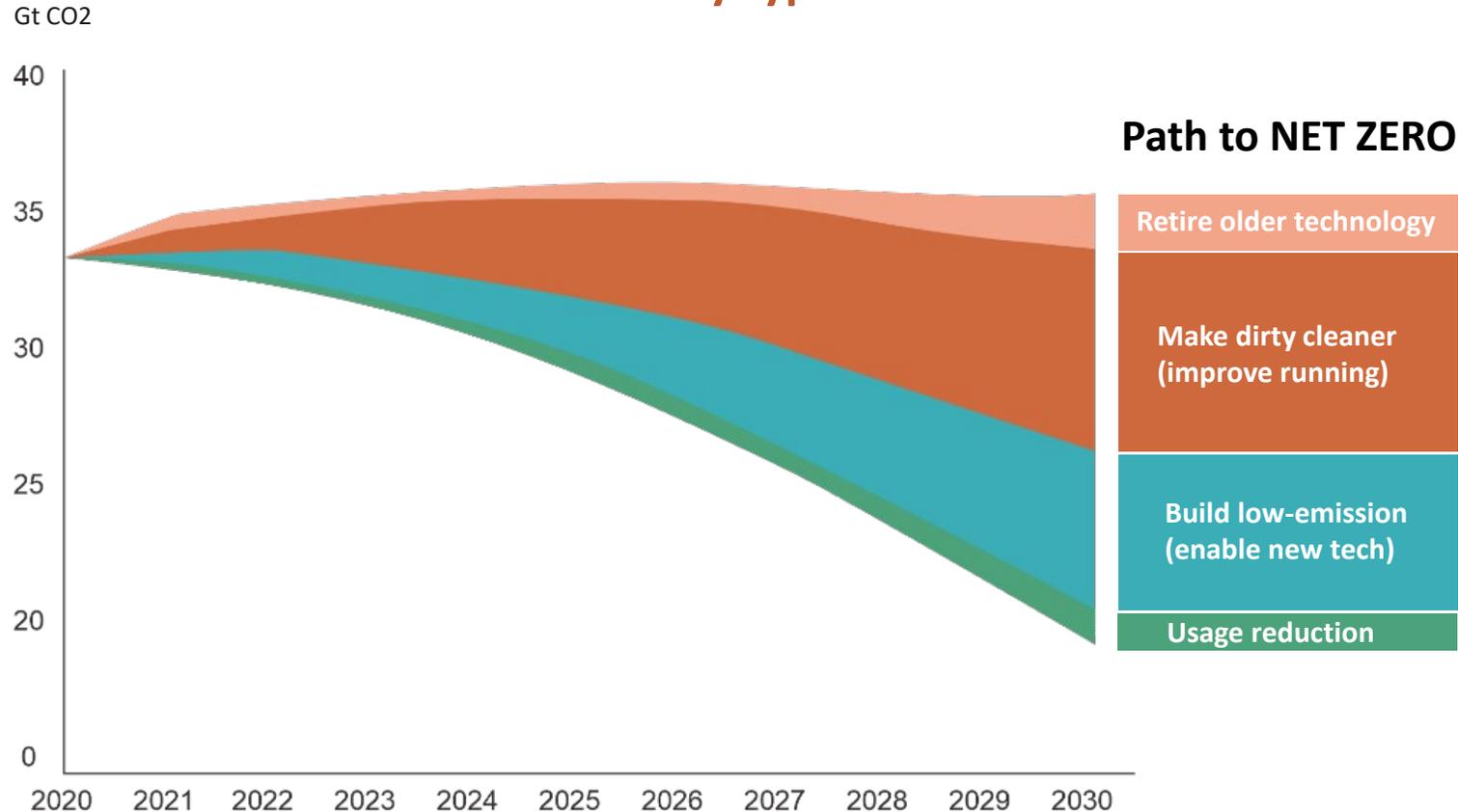
Source: Energy demand: Three drivers | ExxonMobil, Global

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Diesel- and gasoline-powered machines will drive energy demand growth over the next few decades

How do We Contribute?

Emissions reduction by type of measure



neol's efforts are aimed at solving this significant issue

Source: IEA (International Energy Agency)

And we want to **CONTRIBUTE TO CLIMATE CHANGE FIGHT** in the areas where others can't

The Story



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A Story of a Man

Every memorable story has a hero

This is Neil. Neil is a manager in the transportation or industrial sector, whether running a trucking company, an agricultural firm, or an energy enterprise.



Neil **makes daily decisions** to protect his businesses and prepare for the future, much like the head of a family. He feels the need to keep everyone safe amidst the looming threat of climate change, striving to be part of the solution rather than the problem.

But at work, our hero is laser-focused on performance, profit, and resilience. Keeping clients happy, jobs safe, and margins protected is crucial. **With increasing expenses, cutting costs is a priority. Equipment must now last longer and operate efficiently.** Fleet managers aim for zero disruptions to asset performance.

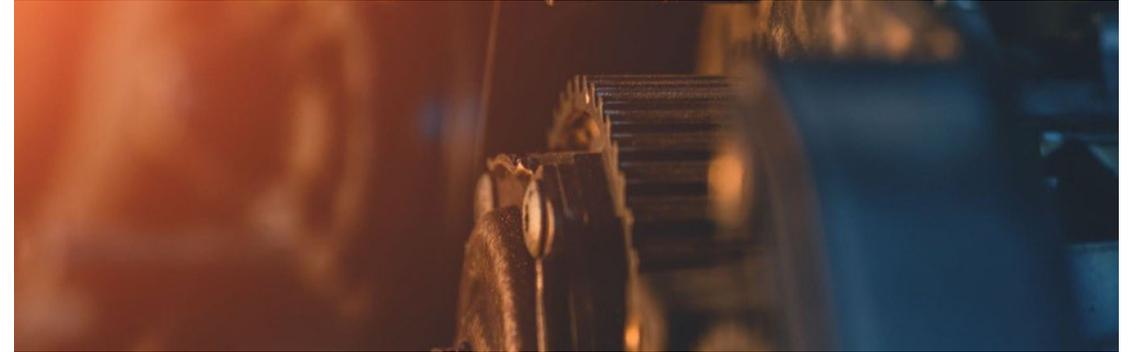


And it doesn't end there. Human resources too are in short supply while equipment utilisation becomes more and more complex. Environmental contamination is an on-going concern. And fluctuations in variable costs abound in their usual unpredictable way.

Along this journey, the commercial realities for fleet operators may conflict with their ecological aspirations.

Neol is Here to Help

NEOL Copper Technologies has developed a new innovative lubricant technology, and real-world testing continues to demonstrate that engines and gears using CuGlide-powered oils experience a **rejuvenating transformation** in efficiency as the lubricant coats and heals damaged/worn areas, removes sludge and deposits with a cleaning effect, and does not block DPFs or poison expensive catalysts and sensors.



Data from field trials have shown tangible quantitative fuel saving improvements, demonstrating that **NEOL's science can deliver a significant TCO** (total cost of operating) **saving to commercial vehicles** – helping fleets in their quest to manage costs, achieve profitability, keep ageing equipment running for longer and giving a direct impact to their carbon footprint (CO2 reduction).

Increasing the lifespan of machinery provides an opportunity to delay the need for replacement costs and helps our environment by avoiding scrappage of valuable material resources.

At NEOL we believe there is a WIN-WIN

Our Products

From transportation to industrial technology, EV and H2

Neol offers a comprehensive range of products tailored to various sectors. These products serve as a no-SAPS alternative to conventional oils, providing users with an effective alternative that aligns with decarbonisation and climate preservation commitments.



For **commercial vehicles, marine and railroad** we offer:

- Engine oils
- Gear oils
- Hydraulic oils
- Greases
- New lubricants for EVs/H2 ICE



And for **industry** we offer:

- Application greases
- Zinc-free high-performance hydraulic oils
- Reductor and gear oils
- Energy-saving lubricants for stationary diesel generators

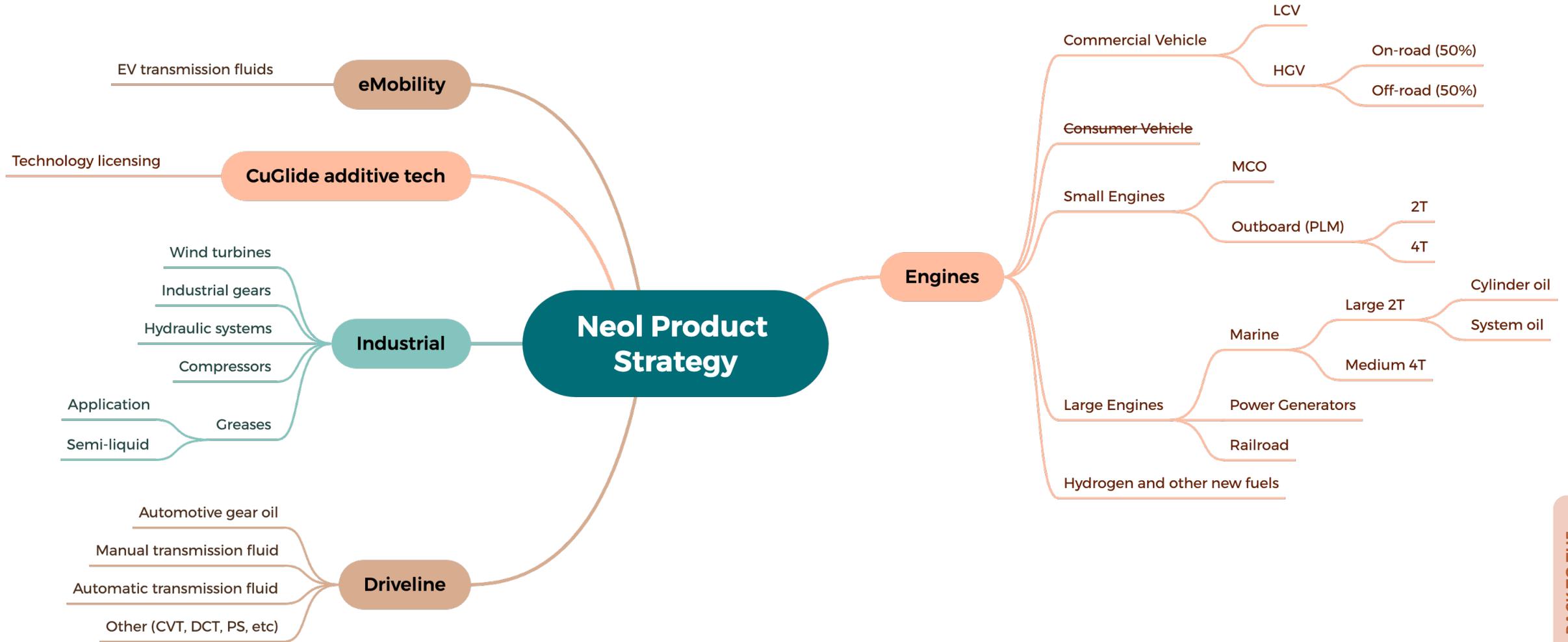


Technical Case Studies | Portfolio



A spectrum of successful case studies with innovative no-SAPS synthetic oils in a mix of real-world and laboratory-controlled tests in new and aged engines and machinery

Product Strategy



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Technolog's versatility allows us to THINK BIG

Application Benefits



Power generation

- Protects wind turbine gearboxes from premature failure due to white etch cracking (WEC)
- Extends service life (with lower friction, vibration and working temperature)
- Reduces maintenance costs and downtime
- Restores and preserves designed fuel efficiency
- Empowers generators' transition to zero-emission fuels

Lower CO2e emissions and cheaper electricity



Engines

- Protects against hydrogen wear
- Extends service life (with lower friction, vibration and working t°C)
- Repairs damaged surfaces
- Restores and preserves designed fuel efficiency
- Extends in-service compliance of exhaust aftertreatment systems
- Better job with less chemistry
- Lower PCF / Lower toxicity / Easier to recycle
- Fuel agnostic lubricant

Lower CO2e emissions throughout lifecycle



Industrial applications

- Reduces operating temperatures & energy consumption
- Extends service life of gears, bearings, compressors and hydraulic systems (with lower friction, vibration and wear)
- Protects from hydrogen wear
- Reduces toxicity of spills
- Supports filtration-on-the-spot and lower volume of lubricant consumption
- Reduces maintenance costs and downtime

Lower CO2e emissions, less waste and resource overuse



Electric mobility

- Protects against hydrogen wear
- Extends bearings service life
- Prevents copper wires corrosion
- Improves energy efficiency due to lower friction (extended battery range)

Higher efficiency of e-mobility

The Value



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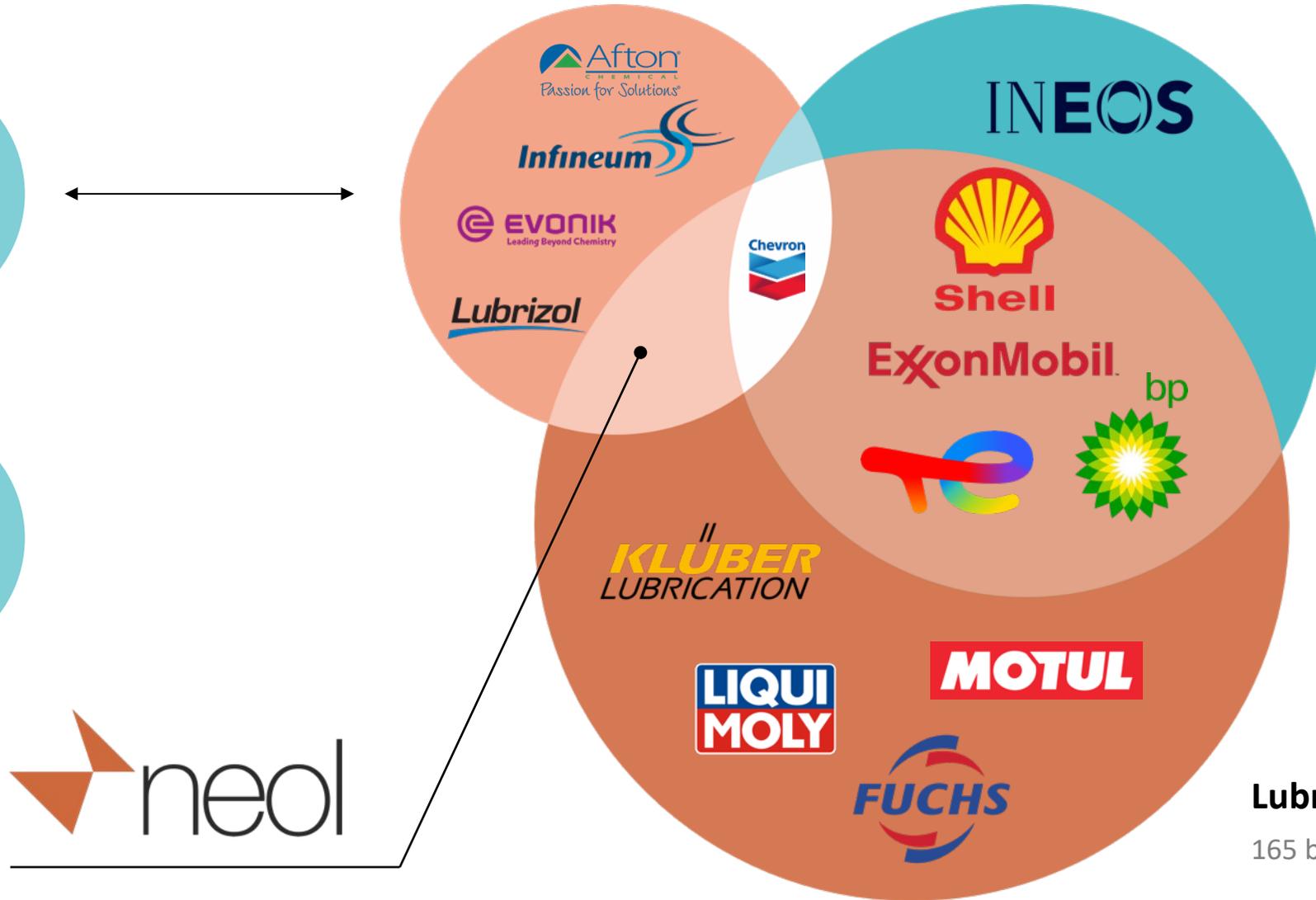
Where is NEOL?

OEMs

Testing Lab

Additives
13 billion USD

Base oils



Lubricants
165 billion USD

Why Us and Why Now?

Modern ICEs are very efficient. The next step to optimise ICE performance is to introduce a new lubricant solution, which can **maintain the initial engineered fuel efficiency** for longer and **repair the old**. We can maximise the efficiency of current equipment by making it much cleaner and healthier within short timeframe without any substantial changes in technological processes and keeping it new throughout its entire life.

NEOL's technology versatility allows formulation of high-performance life-extending lubricants for such heavy industries as mining, energy generation, commercial transportation, industrial manufacturing. It is a well-known fact that **these industries are extremely hard to bring to net zero, and they will drive growing energy demand in the next decades**. So, any immediate reduction in energy and resource consumption matters a lot.

CuGlide™ also enables formulation of **new generation lubricants** for electric vehicles and future hydrogen-fuelled powertrains (both ICE and hydrogen-electric) where the conventional technology has significant limitations.



What Can Neol Offer Versus Industry Competitors?

| | (Remove) <u>SAPS</u> ↓ | (Remove) <u>Zinc</u> ↓ | (Rejuvenate) <u>Performance</u> ↑ | (Prevent) <u>Wear</u> ↑ | <u>Fuel Efficiency</u> ↑ | (Reduce) <u>Emissions</u> ↓ | (Manufac.) <u>Footprint</u> ↓ | <u>Industry Identity</u> ↑ | <u>Market Channel</u> ↑ | <u>Market Share</u> ↑ | <u>Proven & Tested</u> ↑ | <u>OEM Qualified</u> - |
|-------------------------|---|---|---|---|---|---|---|---|---|--|--|--|
| Neol | | | | | | | | | | | | |
| Global Additive Tech | | | | | | | | | | | | |
| Alternate Additive Tech | | | | | | | | | | | | |
| Comments | <p>Neol @ <0.1% is Unique</p> <p>Industry remains static on classic Detergents.</p> | <p>Neol @ 0% is Unique</p> <p>Industry continues to depend on ZDDP! Albeit lower levels.</p> | <p>Neol reduces friction & revives equipment performance.</p> <p>Standard oils protect – not rejuvenate.</p> | <p>No wear after rejuvenation is unique.</p> <p>Wear & tear is a natural occurrence.</p> | <p>Neol recovers lost fuel economy & power.</p> <p>Standard oil depend on low viscosity grades and novel friction modifiers.</p> | <p>Neol: Less friction. Less wear. Higher efficiency. Cleaner engines. Less fuel. = Less emissions</p> | <p>Unique formulating <7 components</p> <p>Standard additives utilise 15-20+ components</p> | <p>Continue to build & communicate the image and brand through media and marketing.</p> <p><i>Investment required</i></p> | <p>Small scale operating experience.</p> <p>Investment in scale-up and supply chain capabilities.</p> <p><i>Investment required</i></p> | <p>Opportunity for new entrants to penetrate and be a successful in an established market.</p> <p><i>Investment required</i></p> | <p>Continue to generate proof of performance data.</p> <p>Real-world & test cells.</p> <p><i>Investment required</i></p> | <p>Potential for limited OEM approvals. Not a strategic goal</p> <p>Very high £ investment required.</p> <p>High barrier to entry.</p> |

How Do We Create Value?

| | Oils & Greases | CuGlide | Both |
|--------------------------|--|--|--|
| Independent manufacturer | <ul style="list-style-type: none"> 8 Potential Markets 5 Geographic Locations (UK, Australia, EU, US, China or Indonesia) Three Product Categories In Each Market (Engine Oil Transmission or Reductor Fluid, Compressor oil, Hydraulic oil, Application or Semi-liquid Grease. 1.5 to 3.0% Market Share | Revenue from: <ul style="list-style-type: none"> CuGlide Additive Sales or License Payments Up to 10% of ZDDP market | |
| | 30,000 tons per annum with over GBP 200m implied revenue in 2028 | GBP 400m of potential revenue in 2030 | Up to GBP 700m potential revenue in 2030 |
| Partnerships | Sales Revenue from: <ul style="list-style-type: none"> White Label lubricants Share of integrated equipment lifetime service revenue stream ("oiled equipment time" model with filtration or "selling rotations" with SKF) | | |
| | TBC | TBC | TBC |
| Asset Sale | | | |
| | Sale at DCF value | Sale to one of Global Players at Exclusivity Premium | Sale to broader range of players (incl OEMs or large fleet owners) at Exclusivity Premium |

What do We Need to Be Able to do It?

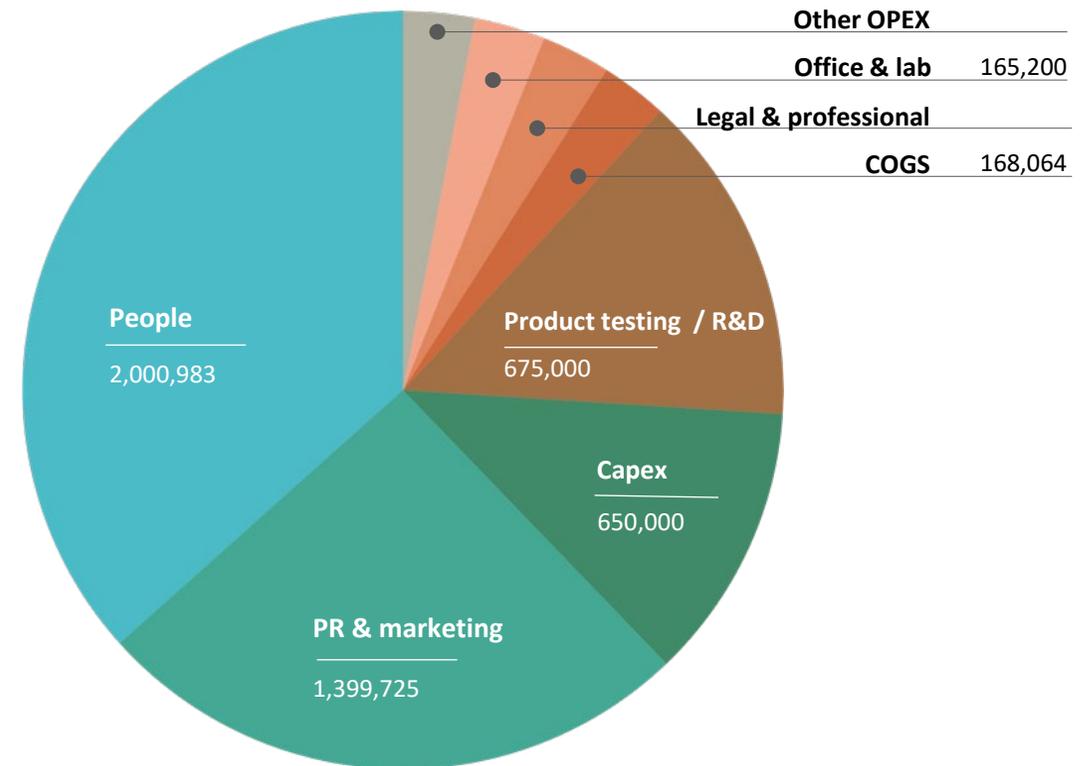


Funding

For now, we need **GBP 5m** to set up a lab with small additive manufacturing capacity in the UK, hire great sales-people and let the whole world know how we can help.

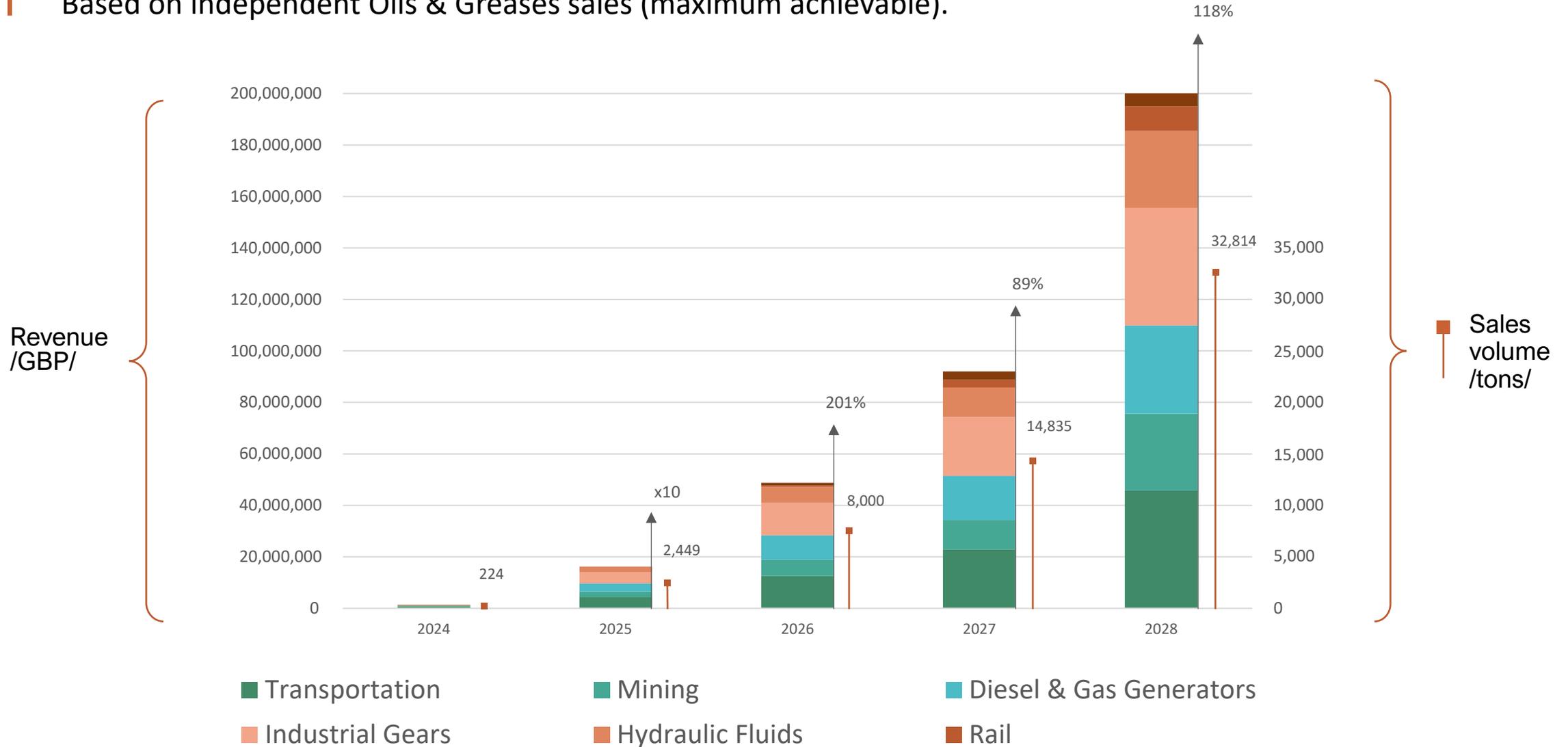
Founders have already invested over GBP 1m in the project.

Use of Funds /GBP/



Revenue Model

Based on independent Oils & Greases sales (maximum achievable).



Our Team



Dr Sergei Mamykin

Chief Scientific Advisor,
design engineer and
tribologist, developer of
CuGlide technology



Leyla Alieva

CEO and Co-founder, team-
leader, professional private
equity investor and business
development specialist



Chris Hatton

Fractional CRO, highly-
experienced cross-functional
senior executive with 20+
years at Accenture, Apple,
Google and Amazon



Alexey Kotov

Deputy CEO (operations),
experienced operational
manager and business
development professional



David Wilson

Head of Products, highly-
experienced industry
professional (30 years at
Lubrizol Ltd prior to joining
NEOL)



Rafe Britton

Technical Advisor,
renowned lubrication
expert (ex-Mobil
application engineer)



Polina Fedorova

Communications
Director, experienced PR
and communications
professional



Marc Hartog

Fractional CFO, highly-
experienced strategic CFO
with entrepreneurial
background



Appendix



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Glossary

ZDDP is one of the oldest antiwear chemical additives and one of the most effective. Under pressure and in the presence of heat, the phosphorus that it carries forms a film on metal surfaces that help protect them against boundary friction. It also helps to prevent oxidation and corrosion. Unfortunately, the chemical is extremely tough on emissions control technologies. Phosphorus tends to poison three-way catalysts and selective catalytic reduction, while ash clogs particulate filters. Moreover, ZDDP forms organic phosphates in exhaust, which are neurotoxic to people. Automakers have been pressing for the reduction of ZDDP in lubricants, but this comes at the expense of anti-wear properties.

SAPS is an abbreviation for Sulphated Ash, Phosphorus and Sulphur content in lubricants.

Hydrogen Wear - wear caused by the release of hydrogen in the friction zone - is the process of wear of metals in the friction contact zone, where the determining factors are the mechanisms of hydrogen embrittlement in microlayers of frictional interaction during hydrogen adsorption on interfaces or diffusion of hydrogen from the bulk of the metal into the zone of frictional interaction.

Selective transfer during friction **/Wearlessness effect/** is a phenomenon that is opposite in nature to wear: if during wear all processes in the friction contact zone are reduced to destruction of the surface, then with selective transfer friction can be accompanied by evolutionary processes, as a result of which the destruction of surfaces becomes secondary. The main thing is the creative nature of friction, which is due to the exchange of energy and matter between the friction unit and the external environment, as well as the collective behaviour of metal ions, from which a thin film is formed that protects the friction surfaces from wear.

Our History

1956

1958

“Wearlessness Effect”* and “Hydrogen Wear of Metals”* phenomena discovered by Professor Dmitry Garkunov and a group of soviet engineers.

1993

Railway engineer Sergei Mamykin meets Prof. Garkunov and begins joint research on the causes of wagon wheel and railway tracks wear. They establish the key reason for wear is hydrogen.

2000

2008

A copper-containing additive to engine oil is tested within Russian Railways.

Its use leads to fuel savings, a decrease in engine oil consumption, and a significant decrease in the engine cylinder-piston group parts failure.

Large-scale tests of the copper-based lubricants are also being carried out. RR's in-house grease plant produces around 10 thousand tonnes of lubricants for wheel-rail contact.

2012

CUPPER LLC is founded by Dr Mamykin. It manufactures copper-based lubricants for technical sports.

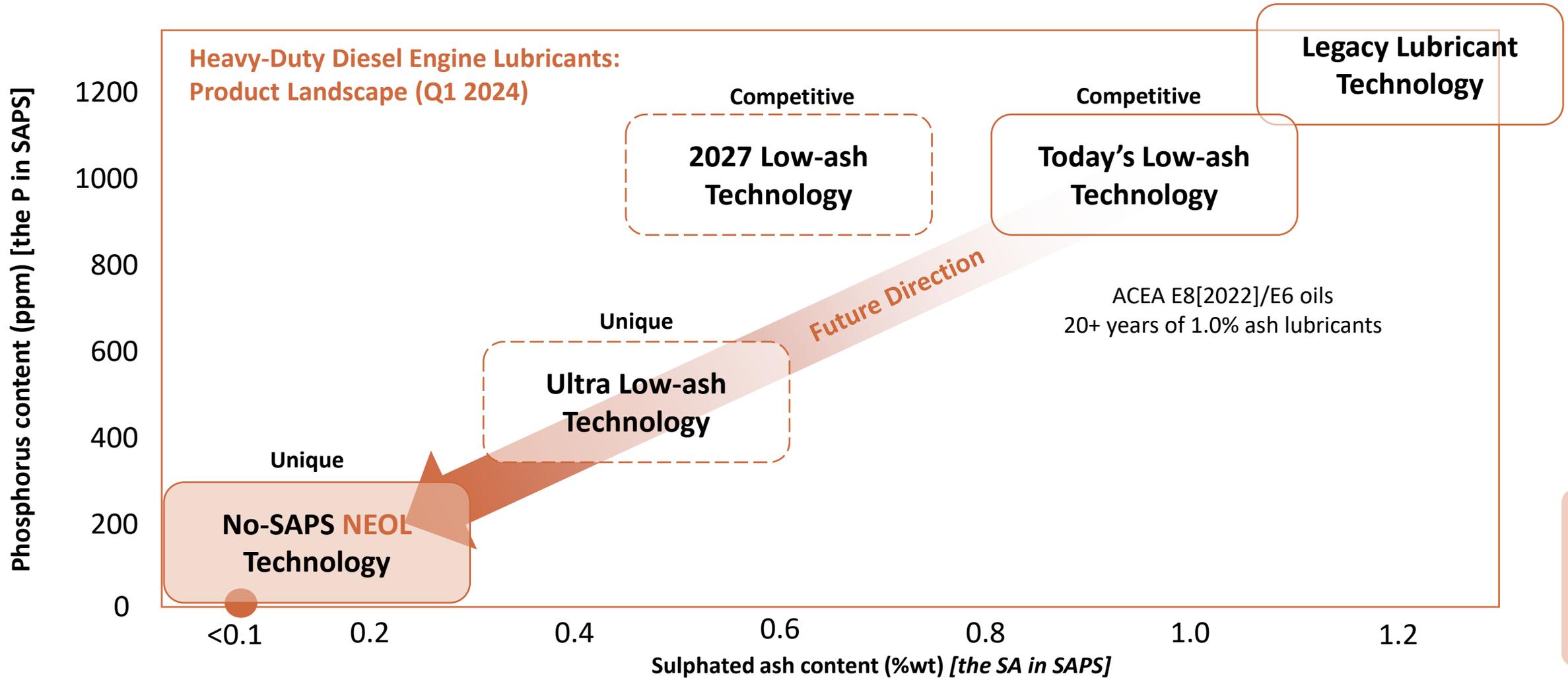
Over the next decade, it grows into an independent manufacturer of oils and greases, selling to over 50,000 private vehicle owners, commercial fleets, and locomotive manufacturers.

2023

NEOL Copper Technologies Ltd (UK) is founded by two UK-based entrepreneurs and former CUPPER LLC executives, with full support of Dr Sergei Mamykin.



The Holy Grail of Engine Lubrication



Industry Insights

Watch Expert Videos

Discover how NEOL is paving the way towards a sustainable future through innovation in technical lubricants.



Rafe Britton* explains how NEOL's CuGlide Technology solves the issue of hydrogen wear. Learn how to harness Mother Nature's intelligence to enhance machine reliability.

Rafe Britton* explains how NEOL's copper filming technology works. He compares CuGlide- vs ZDDP-based anti-wear technologies.



Rafe Britton* delves into the phenomenon called "the hydrogen wear of metals," which serves as the starting point for NEOL's CuGlide Technology.

It's time for change.

