American Petroleum Institute

October 16, 2024

World Business Council for Sustainable Development
C/o Dr. Marvin Henry
Avenue du Bouchet 2bis,
1209 Geneva,
Switzerland
CC: Marvin Henry at henry@wbcsd.org

RE: Lubricants industry perspective on 2023 WBCSD *Guidance on Avoided Emissions* – concerns regarding lost opportunities for efficiency improvements and innovation for main market technologies.

Dear Dr. Henry,

As organizations representing the lubricants industry globally, we appreciate the drive by WBCSD to harmonize the assessment and communication of "avoided emissions" and to help businesses drive innovation. We would like to highlight some concerns regarding the 2023 WBCSD *Guidance on Avoided Emissions* document, which we believe, as written, could (1) stifle innovation for the current dominant technology in the transport sector, (2) undermine efforts for efficiency improvements for existing industry equipment and (3) and negatively impact research and development (R&D) efforts to support future lubricant technology. As a result, society is deprived of the potential to avoid significant levels of greenhouse gas (GHG) emissions by limiting the promotion and subsequent conversion of users to better lubricant solutions.

As we also strive towards harmonization of guidelines in the sustainability space, it had been our plan to build on the WBCSD guidelines to give sector-specific guidance for how to estimate avoided emissions from lubricant applications – but the above-named concerns have prevented the work from proceeding further. We would like to reach out to explore:

(1) How WBCSD would interpret the guidelines as reflecting the GHG reduction potential from the tribological benefits of reduced friction and wear from lubricants, and
(2) if WBCSD would consider making accommodations to the existing guidelines and working together to address the concerns raised.

"Lubricants" in the context of this white paper include lubricants, greases, and other specialty fluids. The lubricants industry in this letter is represented by the American Petroleum Institute (API) and the other organizations listed herein.

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Introduction to the Lubricants Industry

The lubricants industry represents a worldwide market value of USD 155 billion (2023);[1] tribological technologies including lubricants have been shown to have the potential to save 3 140 million tonnes CO_2 in the long term[2] and 44 billion litres[1] of lubricant are used annually to keep the world moving across all sectors including road and off-road transport, rail, aviation, marine and industry. In the energy system, every application with moving parts and any surface contact will require a lubricant. As examples, lubricants and greases are used to manufacture ball bearings, to manufacture conveyor belts, to create engine parts and electric motor components, in the processing of food products, to produce clothing and textiles, and are required to operate wind turbines. At their core, lubricants are intended to reduce friction and wear and to provide cooling and therefore improve efficiency and durability of any application – inherently this brings sustainability improvements in the form of greenhouse gas intensity reductions and makes lubricants enablers of the energy transition.

A study by the Society of Tribologists and Lubrication Engineers (STLE) highlighted the importance of using lubricants in the transport and industrial sectors. Implementation of existing and novel lubrication approaches can significantly eliminate emissions. In the US, these savings may eliminate 110 million tonnes of emitted carbon dioxide which corresponds to 5% of the US share for limiting global warming by 1.5 C by 2030.[3]

Lubricants consequently will make an important contribution to meeting the commitment from nation states at COP28 to doubling the annual rate of energy efficiency improvement, from 2% to over 4% every year until 2030.[4]

Lubricants Industry Perspectives

As per the below, avoided emissions are defined on page 19 of the WBCSD guidelines and there are many examples of lubricants enabling a "solution" with lower GHG emissions in comparison to a reference scenario. This is well aligned with the definition for "avoided emissions" provided in API Technical Report 1533[5] – a sectoral guidance document for the lubricant industry.

> *"Avoided emissions refer to the "positive" impact on society when comparing the GHG impact of a solution to an alternative reference scenario […]. An avoided emission is thus the difference between GHG emissions that occur or will occur (the "solution") and GHG emissions that would have occurred without the solution (that of the reference scenario)."*

Avoided emissions enabled via lubricant use are critical information to communicate to customers. Based on the lubricant industry's interpretation of the 2023 WBCSD *Guidelines on Avoided Emissions*, for any application that relies on the use of fossil energy/fuel (e.g. internal combustion engine (ICE) vehicles; stationary gas engines for combined heat and power generation used in schools and hospitals; mining of

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[1] Source: Kline
[2] Holmberg et al., Friction (2017), *Influence of tribology on global energy consumption, cost and emissions*.
[3] Society of Tribologists and Lubrication Engineers, 2023 Emerging Trends Report
[4] International Energy Agency, https://www.iea.org/topics/cop28-tracking-the-energy-outcomes
[5] See section 6.1 of "Lubricants Life Cycle Assessment and Carbon Footprinting—Methodology and Best Practice" API TECHNICAL REPORT 1533 FIRST EDITION, MAY 2023

critical materials (lithium, cobalt, nickel) for batteries; etc.) it would not be possible to make an "avoided emissions" claim (e.g. not passing Gate 2 of section 4 of the Guidelines). Therefore, any efficiency benefit achieved in these applications – even if they are still the main market technology – could not be communicated as an avoided emissions benefit to the customer.

As outlined in the following sections, not being able to demonstrate the full benefits of the use of a lubricant to customers, including avoided emissions, will limit the conversion of existing solutions and lead to a reduction in the development of new solutions – potentially leading to missing out on reaching the best efficiency with existing vehicle fleets and industry equipment and negatively impacting development of future technologies needed for the energy transition.

Lubricants in the Transport Sector

In the transport sector, lubricants make a crucial contribution to efficiency improvements by offering fuel economy benefits in internal combustion engines (ICE) as for example demonstrated in this study,[6] where for EU road vehicles, a reduction of 3.9 million tonnes CO_2e per year of avoided emissions by 2020 were enabled directly through lubricant use. The same study highlighted an additional 2.7 million tonnes of CO_2e per year that could be enabled via lubricants by 2030 against a 2020 baseline. If indirect benefits (changes in engine technology that required a lubricant change) were considered as well, the avoided emission savings would be more than five-fold higher.

This study demonstrates the avoided emissions can be enabled by lubricant technology and a significant opportunity exists for applying those benefits to the legacy fleet of ICE vehicles that will be in the market for decades to come. For 2023, the United States Bureau of Transportation Statistics puts the average age of a passenger car at over 13 years in the US[7] and the European Automobile Manufactures' Association (ACEA) estimates over 12 years in the EU.[8] Additionally, "according to Oak Ridge National Laboratory, 50% of light duty vehicles sold today will remain in operation in 15 years and some will remain on the road for much longer"[9]; therefore a legacy fleet of ICE vehicles will continue to exist in the market.

Even small improvements in lubricants and greases used in engines, transmissions, and drivetrains in the existing fleet of vehicles can result in tremendous reductions in greenhouse gas intensity due to reduced friction. Based on the interpretation of the WBCSD guidelines by the lubricants industry, claims on avoided emissions enabled via fuel economy benefits in vehicles with ICEs will be ineligible (e.g. not passing Gate 2 of section 4 of the guidelines) – closing down the opportunity to show this benefit to the customer, limiting the conversion to these new lubricant products and reducing the incentive by companies to innovate in this space.

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[6] *Lubricants' contribution to fuel economy*, 2019, https://atiel.eu/wp-content/uploads/2021/04/DOC-20.pdf
[7] Bureau of Transportation Statistics, 2023, https://www.bts.gov/content/average-age-automobiles-and-trucks-operation-united-states
[8] *Vehicles on European Roads*, 2024, https://www.acea.auto/publication/report-vehicles-on-european-roads/
[9] *Transportation Energy Data Book Edition 40*, 2022, https://tedb.ornl.gov/wp-content/uploads/2022/03/TEDB_Ed_40.pdf & *Decarbonizing Combustion Vehicles*, 2023, https://www.transportationenergy.org/research/reports/decarbonizing-combustion-vehicles-a-portfolio-approach-to-ghg-reductions/

Biofuels are increasingly substituting fossil energy carriers in the existing ICE vehicle fleet – therefore starting to decarbonize the existing technology platform. In 2022, "renewables accounted for 5.7% of the U.S. transportation sector's energy consumption"[10]– a trend that is set to continue to the future. An ICE vehicle may run on a range of fuels – from 100% fossil fuels to 100% biofuels or any combination thereof – yet all configurations necessitate the use of a lubricant, which facilitates smoother operation, enhances energy economy improvements, and reducing GHG emissions.

We call on WBCSD to consider the Guideline's impact on stifling innovation in the area of fuel economy and efficiency improvements and potentially losing out on the opportunity to reduce emissions in a large legacy fleet of ICE vehicles.

Lubricants in the Industry Sector:

In the industry sector lubricants support efficiency gains in various existing industrial applications like metal working and papermaking, and in a study[11] that published findings from a workshop titled "Tribological Opportunities," for the US Department of Energy, lubricants have been estimated to be able to avoid 3.1 quads annually in the mining industry (for calibration: US annual energy consumption in 2022 was 100.3 quads[12]; one quad = 10^{15} British Thermal Units).

For industrial applications during the energy transition, significant capital expenditure will be required to replace the existing equipment, which currently often relies on fossil energy carriers. The IEA estimated that even by 2050 some emissions in industry will remain, as this "reflects the scarcity of commercially available options to eliminate all emissions from [..] heavy industry"[13]. While lubricants will be needed for the new industrial equipment – they also play an important role in improving efficiency in the existing equipment until such equipment is retired or modified.

It is the lubricants industry's understanding, that for an existing industrial application that relies on a fossil fuel energy carrier, efficiency gains enabled by lubricants technology could not translated into an avoided emissions claim when following the 2023 WBCSD *Guidance on Avoided Emissions*.

We call on WBCSD to consider the impact the Guideline is having on restricting deployment of efficiency improvements for existing industry equipment until the transition to alternative solutions has taken place at scale.

Future Lubricant Developments and a Question to WBCSD

Many of the modern technologies needed for the energy transition, will require new lubricants, for example: 1) engine oils for plug-in hybrid vehicles (PHEV), 2) thermal and electric drive fluids for battery electric vehicles (BEV), 3) gear oils for wind turbines and 4) transformer fluids for an expanding power grid, just to name a few. Research and development of such future lubricants, however, are generally

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[10] 2023 Billion-Ton Report, 2024, https://www.energy.gov/eere/bioenergy/2023-billion-ton-report-assessment-us-renewable-carbon-resources

[11] Tribology Opportunities for Enhancing America's Energy Efficiency, 2017, https://www.stle.org/images/PDF/STLE_ORG/whitepaper/Opportunities_for_Enhancing_Energy.pdf

[12] Lawrence Livermore National Laboratory, https://flowcharts.llnl.gov/

[13] Net Zero by 2050, 2021, https://www.iea.org/reports/net-zero-by-2050

enabled by existing products. Removing the ability to communicate the avoided emission benefits for such solutions could negatively impact R&D efforts to support new and improved lubricant solutions.

Lubricants for BEVs, like lubricants for electric motors and cooling fluids for batteries, are currently typically derived from fossil feedstocks. In this context, we would like to pose a question to the WBCSD avoided emissions guidelines team:

> We would like to seek clarity regarding the wording presented in the WBCSD guidelines on page 24 column on the right in section 4.2: "…*and is not directly applied to activities involving exploration, extraction, mining and/or production, distribution and sales of fossil fuels*…"
>
> The lubricants industry interpretation of this sentence is that this restriction, as currently written, applies to applications for lubricants, where a fossil fuel is directly involved – like engine oil for an internal combustion engine using gasoline.
>
> While we have voiced our concerns regarding this interpretation in the preceding paragraphs in the context of main market technologies, we would like WBCSD to confirm the following: This restriction does not apply to non-energy products derived from fossil feedstocks (e.g. crude oil) like lubricants and chemicals, which are inherently not a fuel. We would like to point out that in the "Net zero by 2050" publication by the International Energy Agency (IEA) it is acknowledged that "… fossil fuel use in non-energy applications still rises slightly to 2050."[14]
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> We would much appreciate confirmation that the sentence quoted from the WBCSD guidelines above does not apply to use of fossil material for non-energy purposes – as such products are not a fuel.

While the use of new types of feedstocks is actively being explored by the lubricants industry, (including, but not limited to, recycled motor oil in the form of re-refined base oils and bio-content derived lubricants) their widespread use will require further R&D activities to overcome barriers of introduction and to allow for economies of scale to take effect.

We call on WBCSD to consider the negative impact the Guideline is having on future lubricant technology development to support energy transition technologies.

Conclusion

Once again, we would like to thank WBCSD for their efforts in harmonizing guidelines, especially in the important area of "Avoided Emissions" to help businesses drive innovation. We hope to have conveyed our concerns regarding the 2023 WBCSD *Guidance on Avoided Emissions* document, which we believe, as written, could (1) stifle innovation for the current dominant technology in the transport sector, (2) undermine efforts for efficiency improvements for existing industry equipment and (3) and negatively impact R&D efforts to support future lubricant technology. As a result, society is deprived of the potential to avoid significant levels of greenhouse gas (GHG) emissions by limiting the promotion and subsequent conversion of users to better product solutions.

We would like to understand your perspective on the WBCSD guideline regarding concerns raised in this white paper, particularly in terms of how it aligns with the GHG reduction potential from the tribological

[14] Net Zero by 2050, 2021, https://www.iea.org/reports/net-zero-by-2050

benefits of reduced friction and wear from lubricants. We invite you to share your stance and welcome the opportunity to collaborate in tackling the concerns presented.

If there is interest from WBCSD, we would like to offer to present the materials examined in this white paper. For further discussion, please reach out to Prentiss Searles (Searlesp@api.org).

Summary of Signature Organizations

American Petroleum Institute (API)

American Chemistry Council Petroleum Additives Panel (ACC-PAPTG)

Independent Lubricant Marketers Association (ILMA)

Society of Tribologists and Lubricant Engineers (STLE)

Association of Responsible Recyclers (NORA)

National Lubricating Grease Institute (NLGI)

The Technical Association of the European Lubricants Industry (ATIEL)

Union of the European Lubricants Industry (UEIL)

American Petroleum Institute

Summary of Signature Organizations (Continued)

The Additive Technical Committee (ATC)

Asian Lubricants Industry Association (ALIA)

Japan Lubricating Oil Society (JALOS)