

Commentary

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Sustainability in Uncertainty?

1 Introduction

We are living in extraordinary times, stuck between corona crises, climate change and cultural conflicts. It all adds up to uncertainty. In this context, the title of this commentary, „Sustainability in Uncertainty?“ has a dual meaning. The first raises a question: Is sustainability still a priority for the chemical industry during these times of uncertainty now and in the post-pandemic world? The second, however, postulates the opposite: Wouldn't the focus on sustainability be just the right strategy for chemical companies to solve the challenges of these days? This commentary looks at both these questions the chemical sector is facing exemplary from the view of the lubricants industry and also provides examples and solutions on successful sustainable business models and new ideas for the future of the sector.

2 The “3 P's” of Sustainability

At the beginning of September 2019, my son and I were admiring the view from the top of Snaeffelsjökull („jökull“ meaning glacier) in Iceland. Under our feet was mature ice, thousands of years old. The sun was shining, the sky was blue, and it was bracingly cold. There was no lockdown, everything was free and open, and we could travel, go to restaurants and everything was OK. But was it really OK? „Ok“ („Okjökull“ in full) was also the name of the first glacier in Iceland to be declared dead in 2014. In other words, it melted – a direct result of climate change. At what was the base of the glacier is a plaque to commemorate its demise, embossed with the global average atmospheric carbon dioxide concentration when the plaque was placed there in 2019 – 415 parts per million. That was the highest CO₂-concentration ever measured in Earth's atmosphere (Luckhurst, 2019).

Oscar Wilde once said: „Everything will be OK in the end, and if it is not OK, it is not yet the end.“ I believe in the last part; it is not yet the end.

The term sustainability can be traced back to the Latin *sustinere* (tenere, to hold; sub, up). Sustain can mean „maintain“, „support“, or „endure“. The German term „Nachhaltigkeit“, meaning a responsible and long-term oriented management of natural resources, was first introduced by Hans Carl von Carlowitz (1713) in his work „*Silvicultura Oeconomica*“. His concern was to establish a sustainable management of the natural resource wood (Grober, 1999).

Sustainability definitions and business plans often refer to the “3 P's” which consist of profit, planet, and people. These three words that all start with a “P”, describe how the goal of sustainability is within the sweet spot of economic, ecological and social values. The “3 P's” are often referred to the Triple Bottom Line, which is described as ensuring business success by overlapping interests of the society and the environment, in addition to business interests (Slaper and Hall, 2011).

On the economic side, the most sustainable target is to continue making a profit. This is not an unethical goal, but some business leaders might consider it an overriding one. If you'd have asked a CEO or CFO one or two decades ago what there “3 P's” were, many would have answered: “profit, profit and profit.” If you were to ask the same question today, their answers should be – and in many companies, this is becoming the case more and more – “profit, planet and people.” Lubricant companies need to continue making profits, of course, otherwise they are out of the game of making a sustainable difference or contributing sustainable

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solutions in the future, not to mention socially irresponsible and shedding jobs.

Continuing to have the first "P" stand for profit, companies must be aware of the ecological and social footprint they leave behind while making money. This is where the planet and people dimensions of sustainability come into play. Creating not only economic but also ecological and social value for a company, its employees and external stakeholders is no longer an add-on or nice-to-have but has become an integral part of the strategy of organizations that want to be successful in the future.

3 The "3 C's" to Carbon Neutrality

Taking the lubricants industry as an example, the ecological footprint must be measured along the process and value chain of a lube manufacturer. Actually, it's about the "3 C's" of CO₂ - calculation, cutdown and compensation.

The first step must be to calculate the carbon footprint of a company.

Then the next step is to search for possibilities of avoiding and reducing CO₂ emissions. Around 80% of CO₂ emissions of a typical lube manufacturer are caused by heat and electricity consumption, so energy efficiency is an important lever in avoiding or reducing CO₂.

To achieve carbon neutrality as early as possible, it is important in addition to avoiding and reducing emissions to offset the so far not yet avoided or generally unavoidable emissions at the same time with compensation measures. These come through the voluntary promotion by investing in high-quality climate protection projects in socially, politically and/or economically disadvantaged countries - projects, which would not be possible without such additional income. This voluntary financial support not only helps the selected countries to improve their economic, social and ecological circumstances, but is also a major driver for the transfer of clean technologies and sustainable global economic development into those countries and regions. Is this greenwashing? No, this is not greenwashing: Since CO₂ emissions impact the climate at a global level, it is ultimately irrelevant where on the planet they originate and where they are saved. The aforementioned projects are accredited, approved and monitored according to internationally

recognized certification standards and fulfill especially stringent requirements. They not only save CO₂, but also contribute to local sustainable development. The validation of the project results regarding the CO₂ savings achieved, is verified by independent testing bodies such as the TÜV. This mechanism, which is embedded in the Kyoto Protocol, has become firmly established over the past 20 years and proven itself as a central component of voluntary, non-governmental climate protection. The process is supported by the UN, numerous non-governmental organizations and hundreds of large companies, including those in the petroleum and chemical industry.

4 The "5 F's" of Carbon Calculation

Thus, the solution for the lube industry comes with a stepwise approach or the "5 F's" – footprint, feedprint, fingerprint, fining print and firing print, as I call it. The stepwise approach is shown in Figure 1.

The first "F" is the "footprint", i.e. looking at the corporate carbon footprint in the own lube operations at the worldwide locations of a lube manufacturer, which is generated through heat, fuel and electricity consumption in production, administration, business trips, employee commutes as well as through waste generation and waste water in the company. The objective should be to ultimately bring this carbon footprint to zero with measures described above, so that that all customers will receive lubricants produced carbon neutral processes from a carbon-neutral lubricant company.

The second "F" is the so-called "feedprint". In the long term, a lubricant company will be obliged to sell CO₂-neutral products to its customers. This requires calculating the product carbon footprint of lubricants and it also requires that a lube manufacturer receives carbon-neutral raw materials from its suppliers, as raw materials account for around 90% of the product carbon footprint in a finished lubricant.

The third "F" is the so called „finger print“: Developing, producing and marketing numerous emission-reducing and eco-friendly lubricants which in the application phase, make a greater contribution to saving energy and CO₂ emissions than conventional alternatives thanks to higher reduced friction and ability to protect against wear and corrosion.

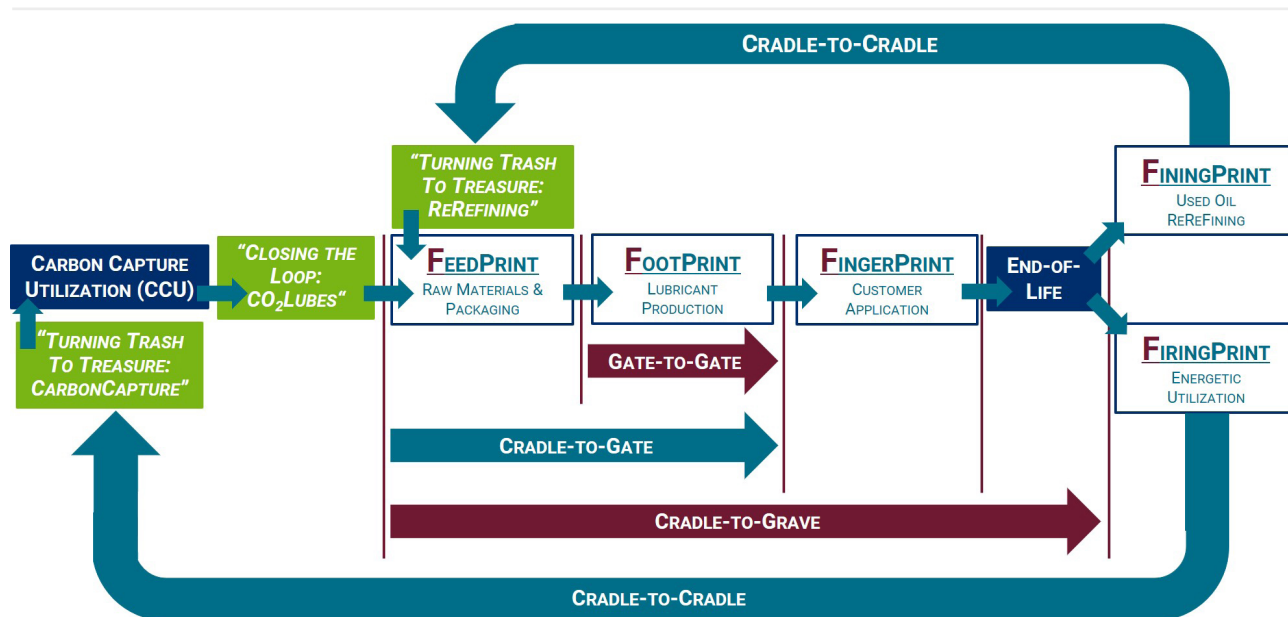


Figure 1 The "5 F's" of CO₂-calculation (own representation).

The fourth "F" is the so called "fining print". At the end of life of a lubricant in an application, waste oil collection and rerefining into new feedstock instead of being burned in a cement factory, also saves CO₂ – I call this process "Turning trash to treasure".

The fifth "F" is the so called "firing print". When the regeneration of waste oils does not make sense due to their high content of additives or pollutants, they may be recovered for energy purposes as a substitute for normal fuels in combustion plants (Umweltbundesamt, 2014). During this process of course again CO₂ is emitted in the atmosphere, but it can be captured and converted into lubricants again – I call this process: "Closing the loop by CO₂Lubes". A meanwhile completed project named "CO₂Lubricants" was aimed to convert CO₂ into lubricants. The project was funded with ~ € 1.6 million over 3 years by the Federal Ministry of Education and Research (BMBF) in Germany and involved 5 joint partners, including a lubricant company and the Technical University (TU) of Munich. As the supply of CO₂ is on the one hand an atmospheric concentrate and, on the other hand, a gas from combustion processes, this CO₂ in the project was used for the cultivation of optimized algae cultures, which produce a high proportion of lipids. These lipids were used purely or in further processed form for the production of high-performance lubricants. The oil-free residues of the algae biomass could be used for the cultivation of oil yeasts (Technische Universität München, n.d.).

Bringing down the corporate and product carbon footprint of a lube manufacturer has not only to do with planet but also with profit, as receiving carbon neutral products is what big industrial and automotive OEMs expect from their suppliers – also lube suppliers – right now and not only starting many years in the future.

5 The "5 P's" of Sustainability, the 5 Principles of Effectuation, the "5 R's" for Post-Pandemic

The current short-term corona crisis puts pressure on sustainability while the long-term climate crisis gives purpose to it. Therefore, we should no longer only look at the well-known "3 P's" of sustainability but should add two more and think in terms of "5 P's" from now on, as shown in Figure 2.

The fourth "P" calls for an examination of the actual purpose of companies. Employees care more about sustainability than ever before and want to contribute to the higher goals of their company. For companies and their employees, it is therefore a question of finding a balance between profit and purpose. More and more companies are talking about their „purpose,“ i.e., an objective and *raison d'être* that goes beyond just making a profit. The predominant purpose of a

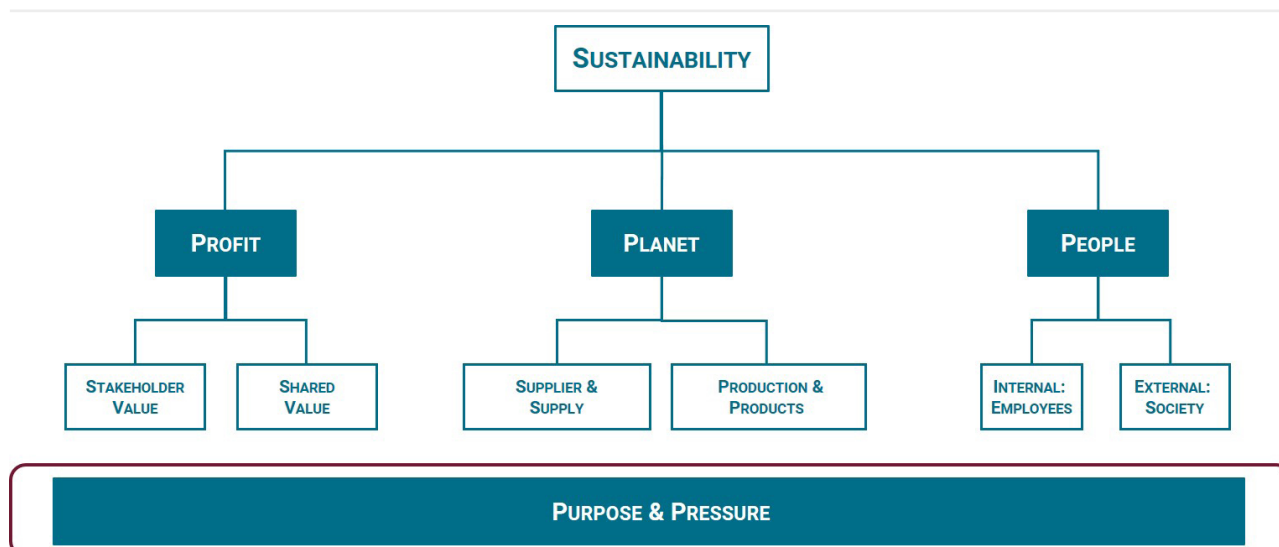


Figure 2 The “5 P’s” of sustainability (own representation).

company in my view must be, to provide sustainable value to its customers.

The fifth “P” is the pressure due to the uncertainty we all face these days. Moreover, companies are confronted with new and changed expectations from various stakeholders in terms of measurement, regulation and establishing sustainability as a business case - this will have a significant impact on the future business activities of companies. In this respect, sustainability can no longer be an add-on, but must be established as an integral part of the process value chain of companies.

The expectations of the stakeholders will continue to stay and even be intensified, while the uncertainty can be managed by an interesting concept called „effectuation.“ Effectuation is a method of decision making that is used during uncertain times and that has unclear goals. Classical management dictates that one can predict or plan for the future, while effectuation accepts that chaos and the unforeseen can and will happen but that the future can still be shaped. Metaphorically speaking, when friends turn up to your house unannounced in the evening, you feel obliged to feed them. Since the stores are all closed, you improvise the best you can with what is already in the fridge (Küppers, 2020).

The Five Principles of Effectuation are:

1. **Bird in Hand:** Create solutions with the resources available here and now.
2. **Affordable Loss:** Only invest as much as you are willing to lose.
3. **Crazy Quilt:** Enter into new partnerships that can bring new funds and directions.
4. **Lemonade Principle:** Mistakes and surprises are inevitable and can be used to look for new opportunities.
5. **Pilot in the Plane:** Co-create the future with things under your control and with self-selected partners.

How does effectuation connect to sustainability? The answer comes with my “5 R’s”: recover, rethink, reset, restart and reduce. **Recover** by means of effectuation from the pandemic. **Rethink** your business model. The current crises revealed to us through a magnifying the mistakes some companies have done in the past. Press the **Reset** button, which many companies have been forced to do. **Restart** your business again in a more sustainable way, for example, by integrating the United Nations’ 17 Sustainable Development Goals, which resulted from the Paris Agreement of 2015 as a guideline and framework. **Reduce** resources and base your strategic thinking on repair, recycling, and reuse. This fosters a thinking toward the circular economy and cradle-to-cradle resource management, wherever possible, e.g. by “Closing the loop: CO₂Lubes”.

6 In Uncertainty: Sustainability!

The word sustainability is overused – in conferences, promotional literature for products, in year-end reports – yet there is still no common consensus on what it means in the business world. I believe that, at its core, corporate sustainability means continuous improvement, in all fields along the process or value chain of the business, to create economic, ecological and social value for the stakeholders of a company, be they customers, employees, investors, suppliers, communities and government. This is especially important during this seemingly endless pandemic.

Thus, sustainability in times of uncertainty takes on another layer of meaning when we examine the word itself: „sustainability“ – the ability to sustain business. Companies are faced with the question: „How can we sustain the abilities of our people, our production, our products and our customers during and after the pandemic“?

Thus, coming back to the initial question with the two meanings of the title of this commentary: sustainability in uncertainty. Is the concept of sustainability uncertain? – Not at all on the contrary: sustainability is a solution in times of uncertainty. And there are new strategic windows of opportunity opening up especially in Europe with the European Green Deal and the plan to be the first climate neutral continent until 2050. To do so, it will carry out a set of initiatives, e.g. decarbonisation targets for 2030 (EU, n.d.). German companies call for COVID-19 state aid to be tied to climate action and that economic policy measures should be closely linked to overcome both climate and corona crises (Schuetze, 2020).

To me, sustainability indeed is between the recovery of the industry post pandemic and innovations which must come as sustainable solutions for companies on their (e)mission to zero alongside the “5 P’s” of sustainability.

Going back to Iceland: In August 2019 – one month before I was there with my son – a board plaque was set up at the bottom of the former Ok-glacier, which was titled: “Letter to the future”, saying the following: “Ok is the first Icelandic glacier to lose its status as glacier. In the next 200 years all our main glaciers are expected to follow the same path. This monument is to acknowledge that we know what is happening and what needs to be done. Only you know if we did it.” (Luckhurst, 2019).

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