Evonik Carbon Footprint 2021

EVONIK
Leading Beyond Chemistry

Contents

EVONIK CARBON FOOTPRINT

1

Summary and results

Protecting the climate and the environment represents a major global challenge. Evonik Industries (referred to below as Evonik) takes climate and environmental protection very seriously as a key element of its corporate responsibility. Since 2008, we are therefore publishing a comprehensive greenhouse gas emissions inventory along the value chain, from the extraction of raw materials through production to the disposal of products. The important parameter here is the carbon footprint, or CO_2eq footprint. The carbon footprint indicates the amount of greenhouse gas emissions (CO_2 equivalent, also CO_2eq, i.e. CO_2 and other greenhouse gases) produced by a company, a process or an individual product.

The methodology for the report closely follows the Greenhouse Gas Protocol Corporate Standard (referred to below as the GHG Protocol) of the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).[1] This standard is further detailed for chemical companies' scope 3 reporting in the Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain (referred to below as WBCSD Scope 3 Chemical Sector Guidance)[2] published by WBCSD Chemicals in January 2013, in whose preparation Evonik took an active part. Instructions defined in the WBCSD Scope 3 Chemical Sector Guidance document were taken into account for compilation of the Evonik Carbon Footprint (ECF).

The balance accounts for Evonik's direct energy and process emissions (scope 1), emissions from purchased electricity and heat (scope 2) as well as relevant up- and downstream emissions (scope 3). These include emissions from the production and provision of purchased raw materials, services and capital goods, energy-related emissions outside of scope 1 and scope 2, emissions from the transportation of raw materials, from the disposal of waste generated in operations, caused by business travel and employee commuting, the use of company cars and energy requirements of leased offices as well as emissions from the transportation, use, disposal and recycling of sold products. According to specifications within the WBCSD Scope 3 Chemical Sector Guidance, category 10 "Processing of sold products" is not part of the balance. Due to the large number of Evonik solutions for diverse applications, category 11 only considers direct greenhouse gas emissions that are formed out of sold products and released during their use phase over the expected lifetime. Categories 13 to 15 (Leased assets downstream, Franchises, and Investments) are not reported.

The present report covers the greenhouse gas emissions of Evonik's continuing operations. Other potential environmental impacts, including impacts on health and safety, do not fall within the scope of the Evonik Carbon Footprint and are discussed in other publications of Evonik (such as the Sustainability Report and the environmental declarations of individual sites).

[1] World Resources Institute, World Business Council for Sustainable Development:
- The Greenhouse Gas Protocol. A Corporate Accounting and Reporting Standard (Revised Edition 2004),
- Required Greenhouse Gases in Inventories, Accounting and Reporting Standard Amendment (2013),
- Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Supplement to the GHG Protocol Corporate Accounting and Reporting Standard (2011)

[2] World Business Council for Sustainable Development: Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain (2013)

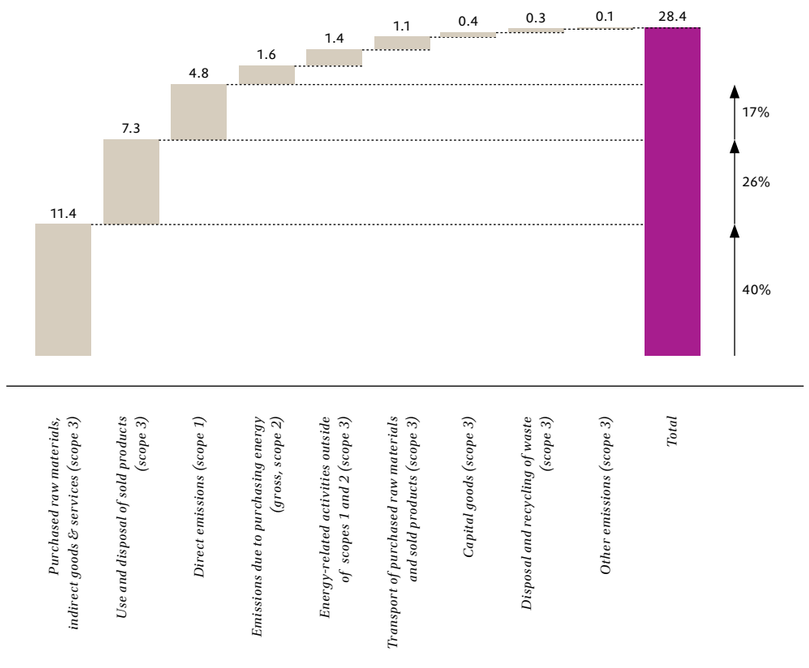
As part of our continuous improvements, methodological adjustments were made to the calculation of our GHG emissions in 2021. Those adjustments mainly related to the scope 3 categories 1 "Purchased chemical raw materials, packaging materials as well as indirect goods and services", 2 "Capital goods", 3 "Energy-related activities", 8 "Leased assets, upstream" and 12 "Disposal and recycling of sold products". Using improved (primary) data sources and enhanced data granularity affected the individual categories to a different extent. The 2020 data have been updated using the new procedure. The main changes were the inclusion of power trading in category 3 (+1 million metric tons CO_2eq) and the inclusion of the gross instead of the net scope 2 emission amount in our GHG inventory. In addition, emissions relating to the use and disposal of sold products are now reported separately in categories 11 and 12. The development of greenhouse gas emissions along our value chain and the contribution made by the individual categories in the GHG Protocol Standard are presented for 2020 and 2021 in Table 1.

TABLE 1: Greenhouse gas emissions along the value chain of Evonik Industries in million metric tons CO_2eq[a]

Scope	*Category*	*2020*	*2021*
Scope 1	Direct energy- and process-related emissions	4.9[c]	4.8
Scope 2	Indirect emissions from purchased energy (gross, market-based approach)	1.6[c]	1.6
Scope 3[b]	Category 1: Purchased chemical raw materials, packaging materials as well as indirect goods and services	10.1[c]	11.4[d]
	Category 2: Capital goods	0.5[c]	0.4
	Category 3: Fuel- and energy-related activities (outside of scopes 1 and 2)	1.8[c]	1.4
	Category 4: Inbound transports of chemical raw materials	0.3	0.6[e]
	Category 5: Disposal and recycling of waste	0.4[c]	0.3
	Category 6: Employee business travel	0.01	0.01
	Category 7: Employee commuting	0.06[c]	0.06
	Category 8: Leased assets, upstream (company cars, electricity and heating of administrative buildings)	0.01[c]	0.01
	Category 9: Outbound transport of products	0.3	0.5[e]
	Category 11: Use of sold products (direct emissions only)	3.6[c]	4.2
	Category 12: Disposal and recycling of sold products	3.0[c]	3.2
Total		**26.5**[c]	**28.4**

[a] Differences in totals due to rounding. Values consider CO_2 removals from biological carbon sequestration at the beginning of the life cycle and biogenic CO_2eq emissions. Relevant amounts can be recorded for the scope 3 categories 1, 11 and 12 as well as for direct process emissions in scope 1.
[b] Some calculations are based on assumptions and estimates. Scope 3 categories 10 "Processing of sold products", 13 "Leasing of assets, downstream", 14 "Franchises" and 15 "Investments" are not reported. Reporting follows a "fast close" process (see section 2.2).
[c] Data corrected due to changes in the methodology and improved data availability. Separate disclosure of categories 11 und 12 and inclusion of gross scope 2 emissions and power trading in scope 3 category 3.
[d] Value includes a total of 1.4 million tons CO_2 from biological carbon sequestration.
[e] Improved data granularity and adjusted data collection method for category 9 (and 4) starting with the year 2021.

FIGURE 1: Evonik Carbon Footprint 2021 in millions of metric tons CO_2eq [a]



[a] Differences between the data and totals are due to rounding. Values consider CO_2 removals from biological carbon sequestration at the beginning of the life cycle and biogenic CO_2eq emissions.

In 2021, greenhouse gas emissions rose to 28.4 million metric tons CO_2eq compared with 26.5 million metric tons CO_2eq in 2020. This was due to a significant recovery in demand compared with the previous year, which was dominated by the pandemic-induced crisis, and the related catching-up effects. As expected, the increase in emissions is reflected in scope 3 category 1 "Purchased goods and services" as well as in categories 9, 11 and 12, reflecting the impact of increased sales quantities on the downstream value chain.

EVONIK'S PARTICIPATION IN THE CARBON DISCLOSURE PROJECT

The Carbon Disclosure Project (CDP) is a globally active non-profit organization that uses standardized questionnaires to collect data on greenhouse gas emissions, climate risks as well as companies' reduction targets and strategies every year as part of its "CDP Climate Change" program. The information is provided on a voluntary basis. Evonik was awarded a grade of "A-" in the 2021 and 2020 CDP Climate Change reporting cycles. By comparison, both the Chemical sector average and the average of European companies participating in the CDP Climate Change in 2020 are in the lower "B" range.

2

Methodology

The GHG Protocol provides the methodological framework for quantifying the Evonik Carbon Footprint. Accounting and reporting of greenhouse gas emissions follow the principles relevance, completeness, consistency, transparency and accuracy.

The GHG Protocol refers to CO_2 equivalence factors, which are used to convert greenhouse gases into CO_2 equivalents (CO_2eq) and thus enable to total all greenhouse gas emissions.[3] The WBCSD Scope 3 Chemical Sector Guidance of 2013 describes standard procedures for implementing the requirements of the GHG Protocol for scope 3 reporting of the chemical industry.

[3] Intergovernmental Panel on Climate Change (IPCC): Fifth Assessment Report (AR5): Climate Change 2013 – The Physical Science Basis, Chapter 8, Table 8.A.1

2.1 ORGANIZATIONAL BOUNDARIES

The Evonik Carbon Footprint was calculated for the continued activities of Evonik in accordance with the full consolidation approach, which was chosen to match the financial and environmental reporting of Evonik. Evonik is aware of the fact that this approach can lead to double-counting of greenhouse gas emissions in cases when two or more external companies holding shares of the same legal entity report their emissions. Emissions arising from discontinued activities are not reported.

2.2 REMARKS CONCERNING THE "FAST CLOSE" PROCESS

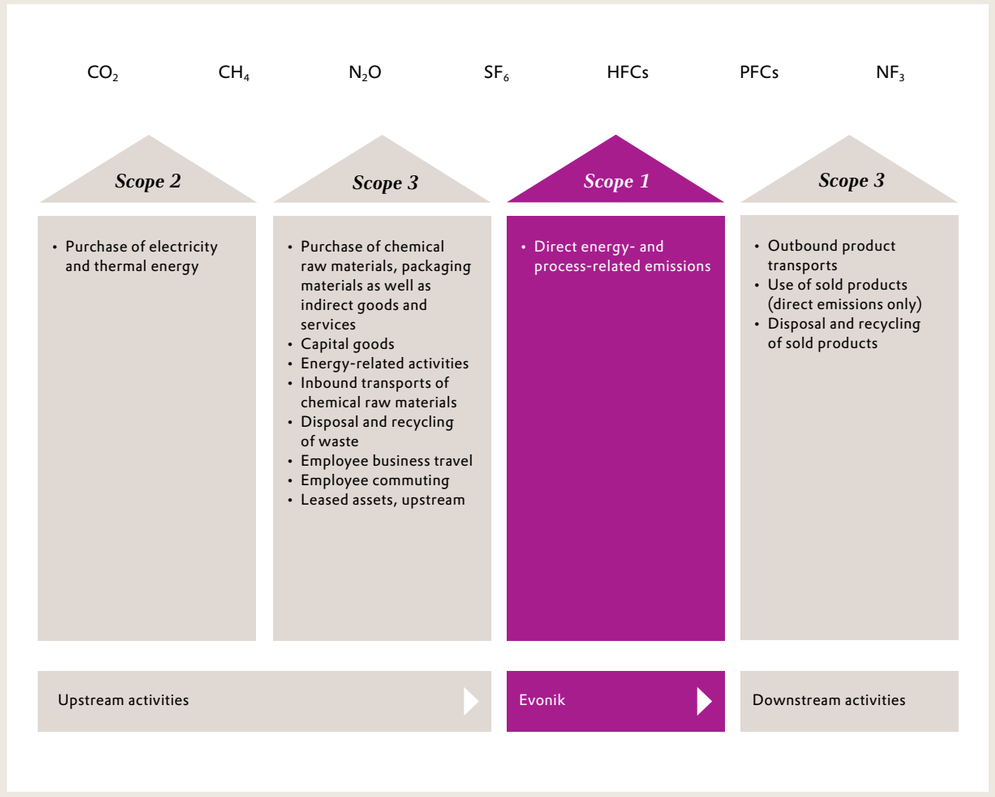
To ensure uniform environmental reporting, starting in 2020, the reporting of Evonik Carbon Footprint data was speed up ("fast close" process).

Data is compiled once a year on September 30 (the Q3 closing date) and for the remainder of the year, i.e. the fourth quarter, the emission amounts are estimated. Together with the respective experts, possible deviations from regular operations in the fourth quarter, seasonal effects and forecasts are taken into account. In the first quarter of the following year, calculations with actual Q4 data are performed and results are compared with the calculated data for the fast close report. Any discrepancies will be analyzed and measures to continuously improve the calculation methodology will be introduced as necessary.

2.3 OPERATIONAL BOUNDARIES

The calculation of the Evonik Carbon Footprint is based on the principles of the GHG Protocol, following the scope concept of operational boundaries[4] (see Figure 2).

FIGURE 2: Overview of areas covered for Evonik's reporting greenhouse gas emissions along the value chain



[4] Refer to the GHG Protocol (http://www.ghgprotocol.org) for further details on the definition of principles and scopes.

Scope 1 covers direct energy- and process-related emissions of Evonik, while indirect emissions from purchased electricity and thermal energy for company use are combined in scope 2, and those from other emission sources in scope 3.

Scope 1 emissions from energy and production processes and scope 2 emissions from secondary energy purchases were calculated using data from Evonik's "Sustainability Reporting (SuRe)" system. The SuRe system also contains more than 100 other environmentally relevant reporting items, as all the information required for Environment, Safety, Health, Quality (ESHQ) reporting – both regulatory- and sustainability-related – is collected within this system.

The GHG inventory includes the gross scope 2 emission volume using the market-based method. More detailed information concerning scope 1 and scope 2 emissions is available in the Evonik Sustainability Report.

Evonik's scope 3 data include emissions from the following categories:

- Category 1: Purchased chemical raw materials, packaging materials as well as indirect goods and services
- Category 2: Capital goods
- Category 3: Fuel- and energy-related activities (outside of scopes 1 and 2)
- Category 4: Inbound transports of chemical raw materials
- Category 5: Disposal and recycling of waste
- Category 6: Employee business travel
- Category 7: Employee commuting
- Category 8: Leased assets, upstream (company cars, electricity and heating of administrative buildings)
- Category 9: Outbound product transports
- Category 11: Use of sold products (direct emissions only)
- Category 12: Disposal and recycling of sold products

In accordance with the specifications of the WBCSD Scope 3 Chemical Sector Guidance, category 10 (Processing of sold products) is not included in the balance. Due to the large number of Evonik solutions for diverse applications, category 11 (Use of sold products) only considers direct greenhouse gas emissions that are formed out of sold products and released over their expected lifetime during the use phase. Categories 13 to 15 (Leased assets downstream, Franchises, and Investments) are not reported. The calculations of greenhouse gas emissions described below do not include the setting up of infrastructure.

The following methodological approaches, partly based on estimates and assumptions, were used to determine greenhouse gas emissions within the different categories:

CATEGORY 1:
PURCHASED CHEMICAL RAW MATERIALS, PACKAGING MATERIALS AS WELL AS INDIRECT GOODS AND SERVICES

Emissions from extraction, production, and transports (except for the transports to Evonik reported in category 4) of purchased chemical raw materials, packaging materials as well as indirect goods and services were calculated in this category.

Chemical raw materials:
The CO_2eq "backpack" calculation is based on a list of all purchased chemical raw materials provided by Evonik's procurement department. All those raw materials and associated amounts for which carbon footprint values were available at the time of calculation were taken into account. By this approach, a considerably higher coverage than 90 percent of the total purchasing volume was reached. An extrapolation of greenhouse gas emissions was carried out for the remaining quantities.

Supplier-specific emission factors were preferably and increasingly utilized. The predominant share of emission factors was drawn from the GaBi 10 database (as of: 2021) provided by the Sphera Solutions GmbH. Where available, geographically representative datasets were used to determine emission factors, otherwise averages from several countries (e.g. global, EU) were used, and only in the last possible case country-specific individual datasets were applied. This approach served to minimize possible uncertainties with regard to regional differences in manufacturing processes and energy production. For some substances, average factors or estimations via similar products had to be applied.

Packaging materials as well as indirect goods and services:
Accounting emissions for production and provision of purchased services and goods, except for chemical raw materials, started from a compilation of all positions with purchase values by the procurement department. All positions were assigned to the categories 1 and 2 (capital goods) with the help of industry codes ("Standard Industrial Classification" (SIC)). For instance, packaging materials, IT hardware as well as technical services are accounted for in category 1.

The emission amounts for the purchased materials and services in 2021 were then calculated by using spend-based emission factors for the respective codes. Those emission factors were extracted from a guidance document provided by the UK Department for Environment, Food & Rural Affairs (DEFRA).[5]

CATEGORY 2:
CAPITAL GOODS

As described under category 1, a list of all indirect purchasing positions as well as a categorization via industry branches enabled identifying all capital goods relevant for category 2. Machines and technical devices fall into this group. Again, calculating emissions was based on multiplying purchase values with respective emission factors according to the industrial classification as listed in the source mentioned above and subsequently adding up all positions.

CATEGORY 3:
ENERGY-RELATED ACTIVITIES (OUTSIDE OF SCOPES 1 AND 2)

Greenhouse gas emissions from the production of the quantities recorded in the SuRe system for solid, liquid and gaseous energy sources that are utilized in Evonik's power plants and processes were determined by the use of representative region-specific emission factors from the GaBi 10 database. Depicting upstream emissions for externally purchased energy amounts of steam and electricity occurred via adequate assumptions concerning the mix of energy carriers and associated emission factors. In addition, emissions resulting from power trading were covered in category 3. Calculations were performed via quantities and CO_2 factors from the mandatory electricity disclosure and adding corresponding upstream CO_2eq-emissions for the respective energy source mix. Again, region-specific upstream emission factors for energy carriers were used and obtained from the GaBi database.

[5] 2012 Guidelines to DEFRA/DECC's GHG Conversion Factors for Company Reporting, Annex 13 (Indirect emissions from the supply chain) (2012).

CATEGORY 4:
INBOUND TRANSPORTS OF CHEMICAL RAW MATERIALS

Since Evonik does not have full knowledge of the transport distances and means of transport for incoming raw materials, an average emission factor per ton of transported product – calculated by using the data for outgoing transports – was applied to quantify emissions from incoming goods transports. This factor refers to the average distribution of different means of transport as well as distances of outgoing product transports of Evonik (see category 9). The use of this average emission factor is based on the conservative assumption that the average means of transport and average distances can be applied to both Evonik's inbound and outbound transports. The transport emissions have been calculated for the extrapolated quantities of purchased raw materials (see category 1).

CATEGORY 5:
DISPOSAL AND RECYCLING OF WASTE

The emissions resulting from the disposal of waste generated in operations were calculated based on the waste quantities for each type of disposal as recorded in the SuRe system. Externally treated amounts of wastewater as well as solid production, construction and demolition waste were included in the computation. The average data method was applied. Representative and partially region-specific emission factors per type of disposal were determined with the help of the GaBi 10 database and adequate assumptions (concerning the c-content).

CATEGORY 6:
EMPLOYEE BUSINESS TRAVEL

The CO_2eq emissions generated by business trips were calculated based on the travel distances provided by Evonik Travel Management and using corresponding emission factors of the means of transport used. Emission factors take fuel supply into account and were adopted from publications of the UK Department for Business, Energy & Industrial Strategy (BEIS).[6]

For instances where travel data was not completely available for individual regions, greenhouse gas emission amounts were extrapolated by means of comparison with the global headcount.

CATEGORY 7:
EMPLOYEE COMMUTING

Emissions caused by employee commuting were estimated with the aid of representative statistics for means of transport, commuting distances and working days in combination with average emission factors. Regional differences were considered and adopted for the corresponding number of employees. Emission factors per passenger kilometer for car and public transportation were taken from BEIS data and take fuel supply into account.[6]

CATEGORY 8:
LEASED ASSETS, UPSTREAM

COMPANY CARS
(EXCLUDING UTILITY VEHICLES):
The CO_2eq emissions related to Evonik's company cars were calculated by using the average number of kilometers as stated in the leasing contracts, the manufacturer's CO_2eq emissions data, and considering additional emissions for fuel supply and for the production of the cars. The calculation was carried out for German employees and extrapolated by using the number of employees worldwide.

ELECTRICITY AND HEATING REQUIREMENTS
OF ADMINISTRATIVE BUILDINGS:
CO_2eq emissions caused by power and heating requirements of administrative buildings are included in the SuRe system and thus already covered in scope 1 and scope 2 emissions, provided that a production plant subject to official CO_2eq reporting is located at the site. For those buildings and offices that are not recorded, the respective headcounts were determined. The calculation of greenhouse gas emissions was then performed by means of average statistical data for electricity and heating requirements per employee and region-specific emission factors obtained from the GaBi 10 database (as of: 2021).

[6] UK Department for Business, Energy & Industrial Strategy (BEIS): Greenhouse gas reporting: Conversion factors 2021 (https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021)

CATEGORY 9:
OUTBOUND PRODUCT TRANSPORTS

CO_2eq emissions of outgoing shipments of chemical products were computed by means of transport mode-specific emission factors. Those emission factors were extracted from a guideline jointly published by Cefic and the Smart Freight Centre in 2021.[7] Calculations were based on the goods issue quantities, the determined or partly estimated transportation distances to the direct customer as well as on the specific modes of transport. The basic information was provided per region by Evonik's logistics procurement.

CATEGORY 11:
USE OF SOLD PRODUCTS (DIRECT EMISSIONS ONLY)

Accounting for category 11 focuses on direct greenhouse gas emissions that are formed and released due to metabolization or decomposition of sold products during the use phase in the downstream chain. In previous emissions reporting, those shares were included in category 12. The product amounts considered here do not require any explicit waste treatment. Calculations considered the quantities sold in 2021, products' carbon content and the stoichiometric conversion to CO_2. For some product lines, only the main products (by amount sold) were regarded specificially and derived assumptions were transferred to the remaining amounts or averaging occurred. Partly, products' carbon contents were estimated via the respective raw materials applied.

CATEGORY 12:
DISPOSAL AND RECYCLING OF SOLD PRODUCTS

Since Evonik is often unaware of the end uses of its own products – especially intermediates – the emissions resulting from their disposal were not calculated for the applications themselves, but only for the Evonik products contained therein.

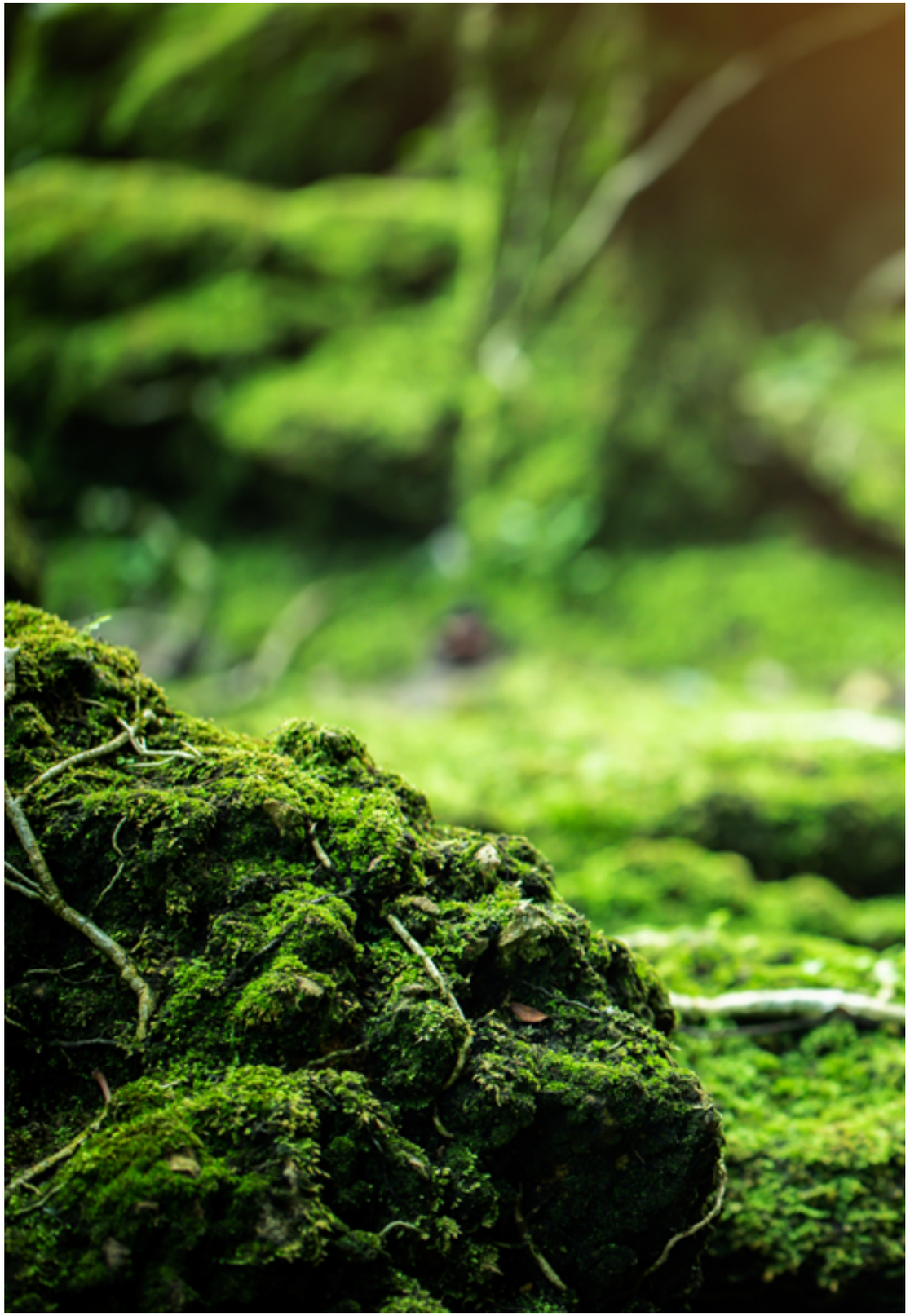
Greenhouse gas emissions associated with the disposal of the product amounts sold in the reporting year – except for those quantity shares directly emitted during use and already accounted for in category 11 – were calculated by considering products' carbon

[7] Smart Freight Centre and Cefic: Calculating GHG transport and logistics emissions for the European Chemical Industry (2021) (https://cefic.org/app/uploads/2021/09/Calculating-GHG-transport-and-logistics-emissions-for-the-European-Chemical-Industry-Guidance.pdf)

contents and representative emission factors for the respective type of disposal (landfilling, incineration with or without energy recovery, recycling and wastewater treatment).

In case of incineration, wastewater treatment and landfilling of degradable products, emissions were calculated based on stoichiometric ratios. For landfilling and wastewater treatment of inert products that do not decompose within a period of 100 years (see WBCSD Scope 3 Chemical Sector Guidance), only the processing effort was depicted. Recycling was assigned an emission factor of zero. In cases where a relevant magnitude of energy recovery during treatment can be expected, adequate emission factors were applied.

Statistics providing shares of the different disposal types for specific (end) product groups were consulted. For some lines, only the main products (by amount sold) were regarded specificially and derived assumptions were transferred to the remaining amounts or averaging occurred. If applications and the disposal route(s) were unknown, a treatment split between incineration and landfilling was assumed. Average shares per disposal type were determined beforehand via regional statistical data (e.g. OECDstat) and Evonik's sold volumes per continent.




REDUCTIONS
IN GREENHOUSE
GAS EMISSIONS
BY USING EVONIK
PRODUCTS

1

Summary and results

Evonik offers numerous products that – compared with conventional alternatives – make a positive contribution to reducing greenhouse gas emissions in their applications. This section presents certain selected "beacon" products that enable greenhouse gas emissions savings compared to their established alternatives.

The reductions listed here are generated by the applications of the following four products: "green tire" technology, amino acids in animal feed, foam stabilizers for insulating materials, and additives for hydraulic fluids. Savings were generated over the life cycle of the applications that were manufactured with the product volumes sold by Evonik in the specified year.

Unless otherwise specified, the data has been compiled since 2013 using the methodology recommended for reporting avoided emissions in the guidance jointly published by the World Business Council for Sustainable Development (WBCSD) and the International Council of Chemical Associations (ICCA) in October 2013 (hereinafter "WBCSD Avoided Emissions Guidance"). In 2017, the guidelines were updated and a second edition published.[8] The WBCSD Avoided Emissions Guidance was developed with the participation of a number of globally active chemical corporations and represents a first international, multi-company agreement on the recording of avoided greenhouse gas emissions of products and their applications. Evonik was also an active participant in the development of the WBCSD Avoided Emissions Guidance.

The criteria for including beacon products in the portfolio of emission-saving products of Evonik closely follow the criteria listed in the WBCSD Avoided Emissions Guidance for selecting a reference product. Both the emission-saving product and the reference product must deliver the same function to the user and be used in the same application. Additionally, the reference solution must be available on the market, interchangeable for the typical customer on the selected market, and as similar as possible to the emission-saving product in terms of data quality, methodology, and assumptions.

The WBCSD Avoided Emissions Guidance recommends reporting the calculated savings associated with the selected application in its entire value chain. In 2021, the use of the four Evonik products resulted in the avoidance of 38.5 million metric tons CO_2eq. These 38.5 million metric tons CO_2eq reflect the total savings of the selected applications that were enabled by the amounts of the four Evonik solutions sold in 2021. The contribution of the individual products are described in qualitative terms (see Appendix) using the significance categories listed in Table 2.

38.5 million tons CO_2eq

avoided greenhouse gas emissions over the application life cycle of selected Evonik products sold in 2021

These CO_2eq savings should not directly be compared with the Evonik Carbon Footprint. The Evonik Carbon Footprint refers to direct and indirect emissions associated with the manufacture of Evonik products – usually intermediates – without a detailed consideration of the use phase. By contrast, the greenhouse gas savings have been calculated on the basis of the life cycle emissions of applications of selected Evonik products compared to conventional alternatives.

[8] World Business Council for Sustainable Development (WBCSD) and International Council of Chemical Associations (ICCA), Avoiding Greenhouse Gas Emissions-Guidelines: Accounting for and Reporting Greenhouse Gas (GHG) Emissions Avoided along the Value Chain based on Comparative Studies, Version 2, December 2017

2

Methodology

Life cycle emissions are typically calculated in Life Cycle Assessments (LCAs) in accordance with DIN ISO 14040 ff. The WBCSD Avoided Emissions Guidance specifies that comparative LCAs should be used to calculate reductions in greenhouse gas emission. However, because LCAs are very time- and resource-intensive, they are not generated for all Evonik products. If, therefore, no LCA is available for the application of a beacon product, emissions and reductions are calculated using the externally tested Carbon Footprint Estimation (CFE) method, primarily on the basis of emission factors from the GaBi LCA software (Sphera Solutions GmbH) used by Evonik.

Evonik developed the CFE model as a method for evaluating early project and research ideas in terms of their greenhouse effects as well as for calculating CO_2eq emissions and savings of products or processes. The methodology of a CFE resembles that of an LCA with some simplifications. In contrast to a full LCA, however, the CFE focuses only on the greenhouse effects of products and processes.

The Simplified Calculation Methodology mentioned in the WBCSD Avoided Emissions Guidance was used for the savings calculation based on comparative LCAs as well as for comparisons based on CFEs. This simplified method specifies that identical parts in the reference and Evonik solutions be excluded from consideration because they do not affect the calculation of saved greenhouse gas emissions. To give an example, the calculation of avoided greenhouse gas emissions for green tire technology did not take account of the entire vehicle over its value chain, but considered only the savings from the use of the silica-silane reinforcement system and synthetic rubber (styrene butadiene and polybutadiene rubber) in a car tire over 150,000 km. This approach has no impact on the ultimate amount of the calculated greenhouse gas reductions. The section below gives further details of the calculation method in the context of the respective reduction projects.

Figure 3 shows an illustration of greenhouse gas emissions and reductions for the reference and Evonik solutions, based on the WBCSD Avoided Emissions Guidance.

GREENHOUSE GAS REDUCTIONS ARE CALCULATED IN ACCORDANCE WITH THE WBCSD AVOIDED EMISSIONS GUIDANCE FOR THE FOLLOWING COMPARATIVE CATEGORIES:

- Category 1, in which the reference solution is equivalent to non-use of a product
- Category 2, in which the reference solution originates from another sector of industry
- Category 3, in which the reference solution also originates from the chemical industry

FIGURE 3: Illustration of CO_2eq emissions and reductions for the reference and Evonik solutions (based on the WBCSD Avoided Emissions Guidance, p. 9)

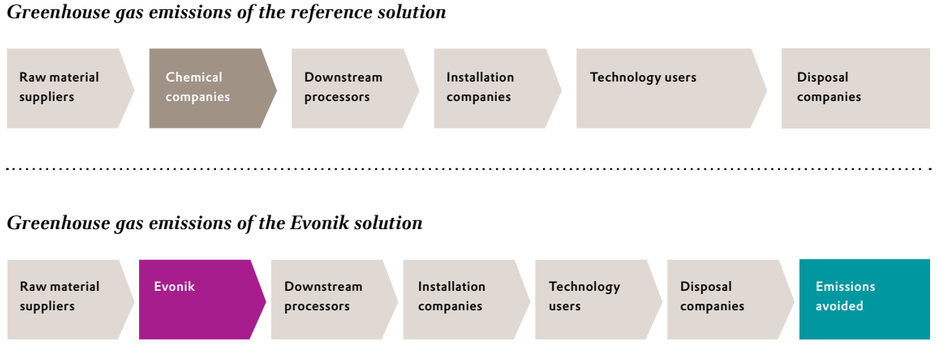


TABLE 2: Significance of the contribution of a chemical product to saving emissions in the value chain, based on its functioning (based on the WBCSD Avoided Emissions Guidance, p. 25)

Significance of contribution	*Relationship between chemical product and application*
Fundamental	The chemical product is the key component that allows savings in GHG emissions in the first place.
Extensive	The chemical product is part of the key component and its properties and functions are necessary to effect savings in GHG emissions.
Substantial	The chemical product does not directly contribute toward savings in GHG emissions, but cannot be easily replaced without changing the GHG emission-saving effect of the solution.
Low	The chemical product does not contribute directly to saving GHG emissions, but is used in the manufacturing process of a product with a fundamental or extensive GHG saving effect.
Too small to communicate	The chemical product can be substituted without changing the GHG emission-saving effect of the solution.

THE FOLLOWING CRITERIA LISTED IN THE WBCSD AVOIDED EMISSIONS GUIDANCE APPLY TO THE REFERENCE SOLUTION:

- The reference application serves the same purpose.
- The reference application is used in the same application.
- The reference application is available on the selected market.
- The reference application is interchangeable for the typical user in terms of quality criteria.
- The reference application is as close a match as possible to the Evonik solution.

In accordance with the WBCSD Avoided Emissions Guidance, the results of the reduction calculations are indicated for the value chain of the entire application, because the contribution of a single product to all savings in the value chain is usually difficult to quantify and can therefore be based on assumptions. Table 2 shows the qualitative description of the contributions made by individual products.

Contrary to the specifications of WBCSD Avoided Emissions Guidance, greenhouse gas reductions are not displayed individually for each application of an Evonik product but as an aggregated figure for Evonik.

THE APPROACH DESCRIBED ABOVE TO CALCULATE CO_2EQ EMISSIONS AND REDUCTIONS IS SUBJECT TO CERTAIN LIMITATIONS:

- Infrastructure measures such as construction of facilities, machinery, and roads, and IT infrastructure are not included.
- Due to the large number of applications of Evonik products, the carbon footprint was calculated only for specific beacon applications that were identified in a screening process. Evonik does not claim to have a complete data inventory on the CO_2eq emissions and savings of all its product applications.
- Evonik is aware that CFEs are not comparative LCAs with an external review panel as defined in DIN ISO 14040 ff.

2.1 REDUCTIONS IN GREENHOUSE GAS EMISSIONS FROM THE GREEN TIRE TECHNOLOGY

HOW DOES THE TECHNOLOGY REDUCE GREENHOUSE GAS EMISSIONS?

Compared to conventional car tires, the use of the silica-silane-system and a certain polymer blend (solution styrene butadiene rubber (S-SBR) and butadiene rubber (BR)) – known as green tire technology – can achieve significant fuel savings and improved wet grip without impacting abrasion resistance (see Figure 4). The lower fuel consumption results in end-users generating fewer CO_2eq emissions.

BACKGROUND

The rubber compounds in tires have a major impact on the characteristics of tire performance. Organic and inorganic components determine the performance of the tread compound that is in contact with the road surface. Such treads typically contain about 35 percent reinforcing filler, without which rubber compounds could not attain the desired properties such as traction, abrasion resistance, tear resistance, and tear propagation resistance. For decades, these properties could only be achieved with customized carbon blacks.

Today, the replacement of carbon black with silica offers even further improvements in car tires. Due to the different chemical properties of rubber and silica, however, these components are not capable of bonding. This is where bifunctional organic silicon compounds – or organosilanes – come in: They serve as coupling agents that bond the silica and rubber in the manner of a bridge.

Key characteristics such as rolling resistance, wet traction, and abrasion resistance can generally be optimized only to a limited extent, and with negative impact on other properties. In contrast to conventional carbon black filler systems, the use of the silica-silane system allowed for the first time an expansion of the "magic triangle" of tire performance (see Figure 5). Rolling resistance and wet traction were improved without significantly affecting abrasion, and therefore the service life, of the tire. These improvements have resulted in significantly lower fuel consumption for end-users, and therefore in reduced greenhouse gas emissions.

Please refer to the Appendix for further information on the methodology, the selection of audit parameters, and other reporting elements in accordance with the WBCSD Avoided Emissions Guidance.

FIGURE 4: Braking characteristics and fuel consumption

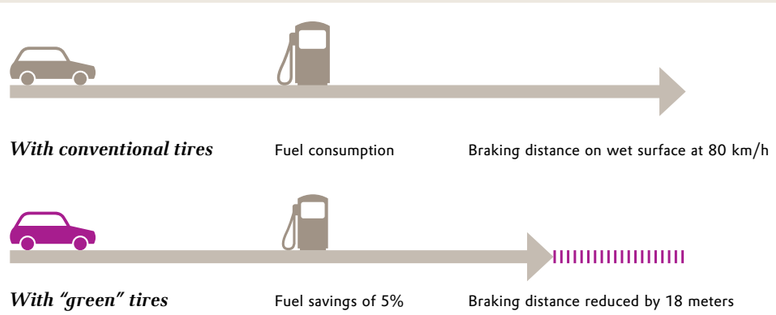
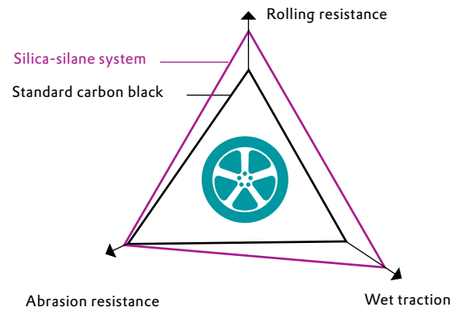


FIGURE 5: Expansion of the "magic triangle" by the silica-silane system



2.2 REDUCTIONS IN GREENHOUSE GAS EMISSIONS FROM AMINO ACIDS IN ANIMAL FEED

HOW DOES THE TECHNOLOGY REDUCE GREENHOUSE GAS EMISSIONS?

Animal feed is specifically formulated to meet the physiological and nutritional needs of the animals, and in particular the necessary requirements of essential amino acids. Lack of certain amino acids in animal feed can be compensated either by adding a higher percentage of protein-rich feed components such as oil seed, or by fortifying the feed with essential amino acids. Supplementing animal feed with essential amino acids can save significant amounts of feed raw materials, resulting in the freeing up of required land and water resources, and a corresponding reduction in CO_2eq emissions. Furthermore, feed supplementation with these essential amino acids reduces emissions of both nitrogen and greenhouse gases resulting from feeding and excretion, and offers credits for the use of natural manure.

BACKGROUND

MetAMINO® is an example of an amino acid containing sulfur. Unlike several other amino acids, it cannot be generated in the animal's own body. Methionine is particularly important in poultry nutrition because of a higher demand for this protein-forming amino acid for feather growth.

Evonik manufactures **MetAMINO®** in a chemical process called the carbonate process. The company produces many of the important intermediates, such as acrolein, methyl mercaptan, and hydrocyanic acid, in an integrated production process at the same site. The reaction steps are integrated in various circuits and byproducts and intermediates as well as energy streams can be used by other plants at the same site.

Biolys® is the Evonik-specific brand of L-lysine (L-α, ε-diamino-n-caproic acid). It is an essential amino acid contained in almost all proteins, and because of its basic side chain is classified as a basic amino acid. L-lysine is the first limiting essential amino acid in hog farming.

In contrast to MetAMINO®, **Biolys®** – like all the other amino acids described here – is produced by biotechnological fermentation processes using microorganisms. As a consequence, these amino acids are automatically obtained as the L enantiomer, which is the only biologically effective form. Evonik's commercial L-lysine trade product is Biolys®, which contains L-lysine sulfate and biomass resulting from fermentation as an additional component. The active ingredient content is at least 54.6% L-lysine.

ThreAMINO® (L-threonine or L-α- amino-β-hydroxybutyric acid) is a neutral essential amino acid.

Alongside methionine and lysine in poultry farming and lysine and methionine in hog farming, threonine is the next limiting essential amino acid.

TRYPAMINO® (L-tryptophan or L-2-amino-3-(3'-indolyl)propionic acid) is among the structurally more complex aromatic amino acids.

Tryptophan is the next limiting amino acid after threonine in hog farming.

ValAMINO® (L-valine or L-2-amino-3-methylbutanoic acid) is an amino acid with a structure relatively similar to that of ThreAMINO®. In both poultry and hog farming valine is the next limiting amino acid after tryptophan.

ThreAMINO®, TrypAMINO® and **ValAMINO®** are produced by a biotechnological method.

Please refer to the Appendix for further information on the methodology, the selection of audit parameters, and other reporting elements in accordance with the WBCSD Avoided Emissions Guidance.

2.3 REDUCTIONS IN GREENHOUSE GAS EMISSIONS BY IMPROVED INSULATION MATERIALS

HOW DOES THE TECHNOLOGY REDUCE GREENHOUSE GAS EMISSIONS?

Evonik develops additives, specifically foam stabilizers (TEGOSTAB®), which are very important in foam production and for optimizing foam properties. These polyurethane (PU)-based foams are used, for example, in building insulation or for insulating electrical appliances such as refrigerators. The improvement of insulation properties reduces energy consumption and thus helps reduce greenhouse gas emissions.

BACKGROUND

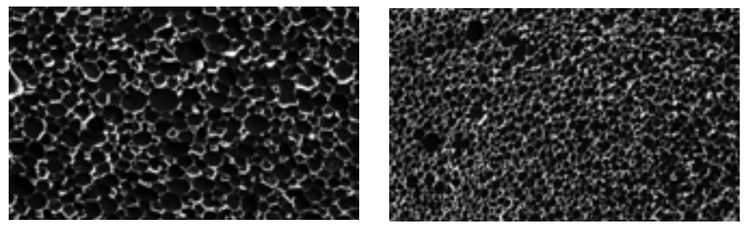
The stabilizers used for the production of polyurethane foam consist of polyether-modified polysiloxanes. In these surface-active substances, the siloxane chain represents the hydrophobic part of the molecule that is located at the surface of the foam cells; this lowers the surface tension and thereby stabilizes the foam. The polyether groups, as the hydrophilic part of the molecule, are responsible for compatibilization with the PU matrix, which makes the surface activity possible.

To achieve maximum foam stabilization and the particularly fine-cell foam structure resulting from this, the molecular structure has to be adapted to the individual foam formulation. Custom-tailored foam stabilizers therefore give rise to particularly good insulating properties in the finished foam product (Figure 6).

In addition to improving the fine-cell structure of foam, customized foam stabilizers also serve to optimize the processing properties of a foam system. They minimize irregularities such as cavities (undesirable hollow spaces) in the foam and help achieve a more homogeneous density distribution, which also contributes to a further improvement of insulating properties.

Please refer to the Appendix for further information on the methodology, the selection of audit parameters, and other reporting elements in accordance with the WBCSD Avoided Emissions Guidance.

FIGURE 6: Micrographs of the cell structure of foam systems with standard additives and with additives from Evonik



Micrographs illustrate the positive effect of optimized Evonik foam stabilizers on the fine-cell structure of rigid polyurethane foams. The left-hand image is a micrograph of the cell structure of a modern foam system for refrigerator insulation; the right image shows (at the same magnification) foam containing the same polyurethane system, in which the standard additives have been replaced by the Evonik additives. The finer the cell structure of the foam, the lower the thermal radiation it can transmit, which results in a lower overall thermal conductivity.

2.4 REDUCTIONS IN GREENHOUSE GAS EMISSIONS BY IMPROVED HYDRAULIC OILS

HOW DOES THE TECHNOLOGY REDUCE GREENHOUSE GAS EMISSIONS?

Mobile construction machines consume the bulk of their required energy in their hydraulic units. Using DYNAVIS® technology enables significant fuel savings and productivity gains compared to conventional hydraulic oils that are mostly monograde fluids or oils with low additives content (Figure 7). Lower fuel consumption means that end users generate fewer greenhouse gases (CO_2eq), especially carbon dioxide.

BACKGROUND

The hydraulic fluid plays a major role in the use of hydraulic construction machinery such as excavators and wheel loaders. Its viscosity and viscosity-temperature behavior has a considerable impact on the operation of such hydraulic machinery (Figure 8). Evonik's oil additive specialists have performed studies with hydraulic excavators of different sizes in day-to-day operations in various applications as well as field tests following a defined protocol that reflects the typical work modes of such machinery.

The viscosity of a hydraulic fluid decreases with increasing temperature. This dependency can be minimized with DYNAVIS® technology, based on fluid formulations with viscosity index improvers of high shear stability, which allows for energy savings.

At low temperatures, such thinner oils reduce internal friction and enable an easier cold start and warm-up phase. At high temperatures, a more viscous oil prevents an increase in internal return flow losses in the hydraulic pumps, thereby increasing volumetric efficiency. This ensures that the viscosity does not fall below a prescribed minimum, thus ruling out overheating, increased wear, and premature failure. For end users these improvements result in significantly higher productivity and lower fuel consumption, and therefore in reduced CO_2eq emissions.

Please refer to the Appendix for further information on the methodology, the selection of audit parameters, and other reporting elements in accordance with the WBCSD Avoided Emissions Guidance.

FIGURE 7: Comparison of monograde and DYNAVIS® hydraulic fluids and effects on the application

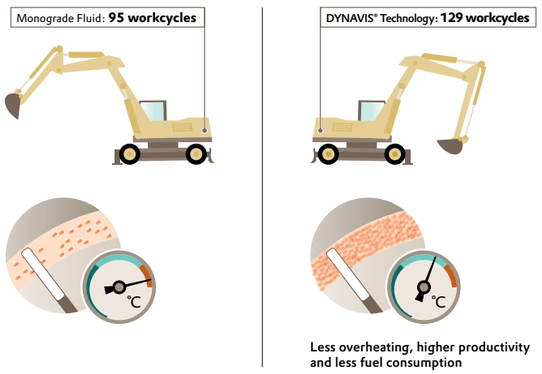
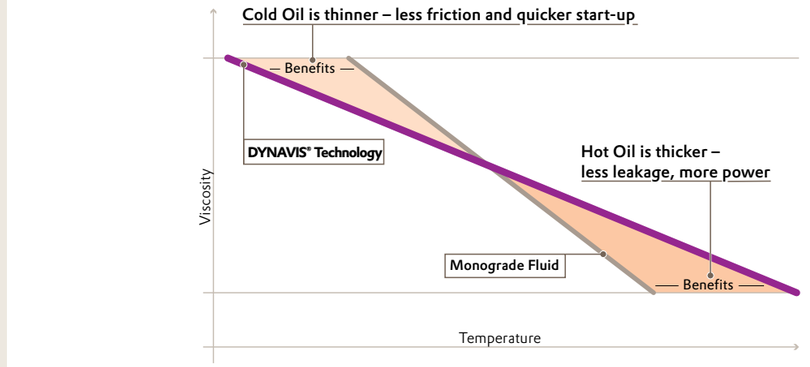


FIGURE 8: Dependence of viscosity on temperature, and positive effects on the application

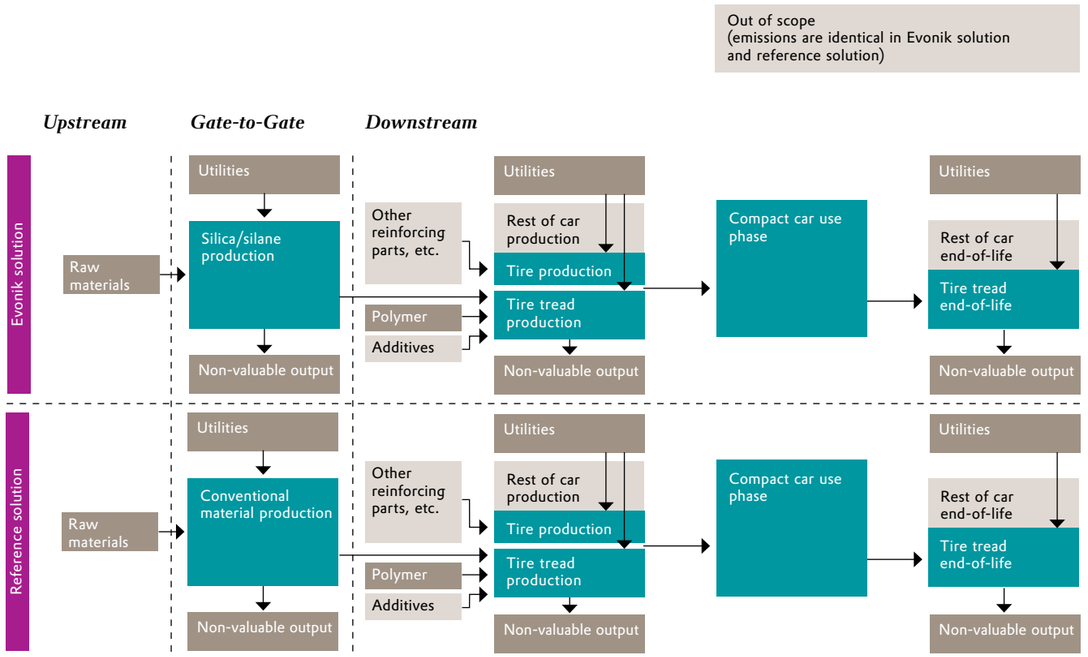


APPENDIX

Reductions in greenhouse gas emissions from green tire technology

Objective of the study	Calculation of greenhouse gas emissions avoided by the use of a silica-silane system in a specific rubber blend (S-SBR, BR) (green tire) as a tread component, as compared with the use of carbon black and emulsion styrene butadiene rubber (E-SBR) (carbon black tire), in a compact car tire over 150,000 km.
Type of comparison	Category 3 (chemical product vs. chemical product/technology)
Reference solution	Carbon black as filler material and E-SBR as tread component. Both the "green tire" and the tire with conventional tread fulfill the same function, are at the same level of the value chain, are used in the same application, and are interchangeable for a typical customer as commercially available solutions.
Functional unit	The use of silica-silane and rubber compound (S-SBR, BR) (Evonik's solution) or carbon black and E-SBR (reference solution) as components in a compact car tire over 150,000 km ("cradle to grave").
Temporal and geographical reference	The life cycle assessment including the external panel review was completed in 2016. The production data utilized refer to the year 2014 and to sites in Germany and Belgium. An update of some timely varying datasets occurred in 2021. Sales volumes of Evonik silica and silanes for 2021 were used to calculate overall savings.
Calculation method	To determine savings in greenhouse gas emissions, the internal Evonik Life Cycle Management team, working in close cooperation with experts from the responsible business lines, performed a Life Cycle Assessment (LCA) in 2015 in accordance with the requirements of DIN ISO 14040 ff. As part of the LCA, the green tire and the conventional carbon black tire were compared over their entire life cycle. To take the use phase into consideration, the required volume of tread components was included in the accounting for the distance of 150,000 km, and the differences in fuel consumption and the associated greenhouse gas emissions were calculated for both systems. For reasons of simplicity, identical emissions (for example, those associated with the manufacture and disposal of the rest of the vehicle) were not taken into account. This approach had no impact on the amount of savings. The greenhouse gas emissions are calculated from the sum of the emissions arising during production of the respective systems as well as the emissions generated during the use phase and in the end-of-life phase. The difference between the green tire and the carbon black tire ultimately shows the savings in greenhouse gas emissions.
Significance of the contribution of the Evonik product to overall reductions in the application	The calculated reductions refer to the entire value chain of the selected application. Evonik silica and silanes are however part of the key components and their properties and functions are necessary and responsible for achieving reductions in greenhouse gas emissions. Green tire technology therefore makes an extensive contribution to reducing greenhouse gas emissions.
References	A detailed list of the referenced literature is available from Evonik on request.
Supplementary notes	The life cycle assessment was externally reviewed and certified as part of a panel review. No scenario analyses for future developments were performed. Allocation of the avoided emissions to companies involved in the value chain was not performed due to the extensive contribution of the Evonik products to green tire technology.

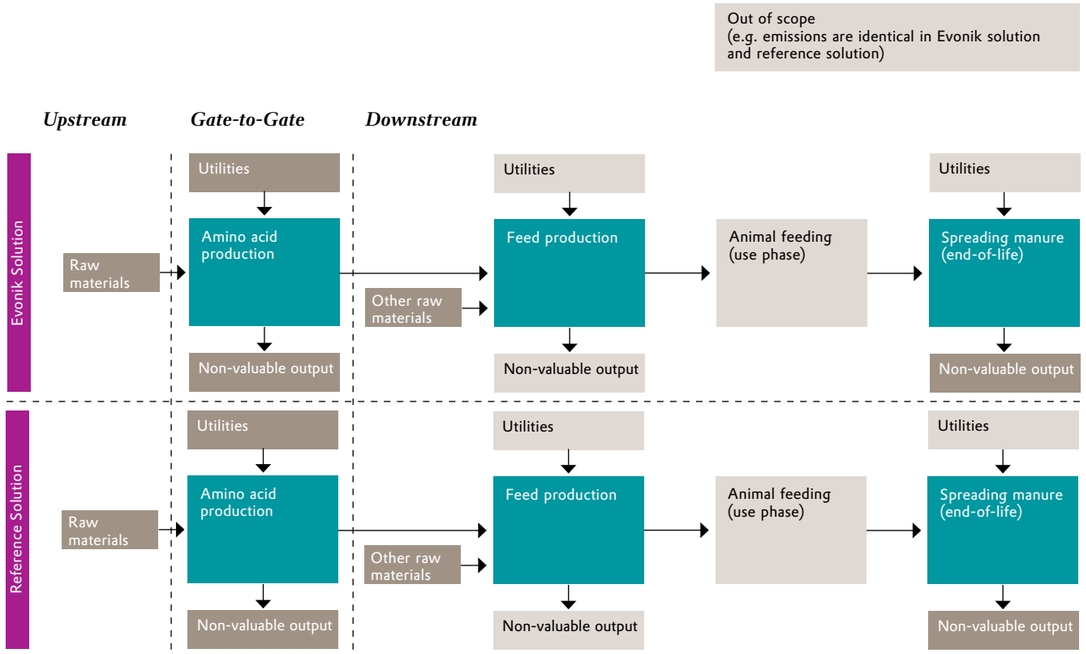
FIGURE 9: Overview of audit parameters for calculating reductions in greenhouse gas emissions from green tires



Reductions in greenhouse gas emissions from amino acids in animal feed

Objective of the study	Calculation of greenhouse gas emissions avoided by the use of amino acids in low-protein animal feed as recommended by Evonik, compared to a level and composition of amino acid supplementation customary in the market.
Type of comparison	Category 3 (chemical product vs. chemical product/technology)
Reference solution	The Life Cycle Assessment compared two options: • Feed mix with a balanced amino acid profile based on Evonik recommendations, representing "best practice" for diets with low protein levels • Feed mix with an amino acid supplementation customary in the regional market. Such a feed mix usually contains less and a different amino acid supplementation. All mixes fulfill the same function, are at the same level of the value chain, are used in the same application, and are interchangeable for a typical customer as commercially available solutions.
Functional unit	The functional unit and the reference flow were defined as 1 ton live weight or, in the case of feeding laying hens, 1 ton eggs.
Temporal and geographical reference	The composition of the feed mixes and the animals' nutritional demands per functional unit relates to the year 2019. Feeding of pigs, broilers and laying hens was covered by the study. The composition of the feed mixes, the animals' nutrional demand and (as far as possible concerning data availability) the regional origin of feed materials was adapted to the regions Europe, North America, South America, North Asia and South Asia, respectively. The global sales volumes for amino acids supplied by Evonik to the feed industry in 2021 were used to calculate total savings.
Calculation method	To determine the reductions in greenhouse gas emissions, the internal Evonik Life Cycle Management team conducted a Life Cycle Assessment (LCA) in close cooperation with the Business Line Animal Nutrition in 2021. This LCA was performed in accordance with the requirements of DIN ISO 14040 ff. and certified externally. Accounting for the individual scenarios with reference to the corresponding specific feed mixes is always in line with the "cradle to grave" principle, i.e., from the provision of raw materials for the individually added amino acids, through agricultural cultivation of feed raw materials, production of mineral fertilizers for agricultural production, expenditures for harvesting, intermediate processing of agricultural raw materials, and all transport-related expenditures for all utilized raw materials, intermediates, and end products in technical terms, to emissions associated with feeding and excretion.
Significance of the contribution of the Evonik product to the total reductions for the application	The calculated reductions refer to the entire value chain of the selected application. The amino acid supplementation recommended by Evonik enables "best practice" low-protein animal feed and has thus together with the amino acids sold by Evonik a fundamental contribution to the savings.
References	A detailed list of the referenced literature is available from Evonik on request.
Supplementary notes	No scenario analyses for future developments were performed. Allocation of avoided emissions to the companies involved in the value chain was not performed due to the fundamental contribution of Evonik's amino acids.

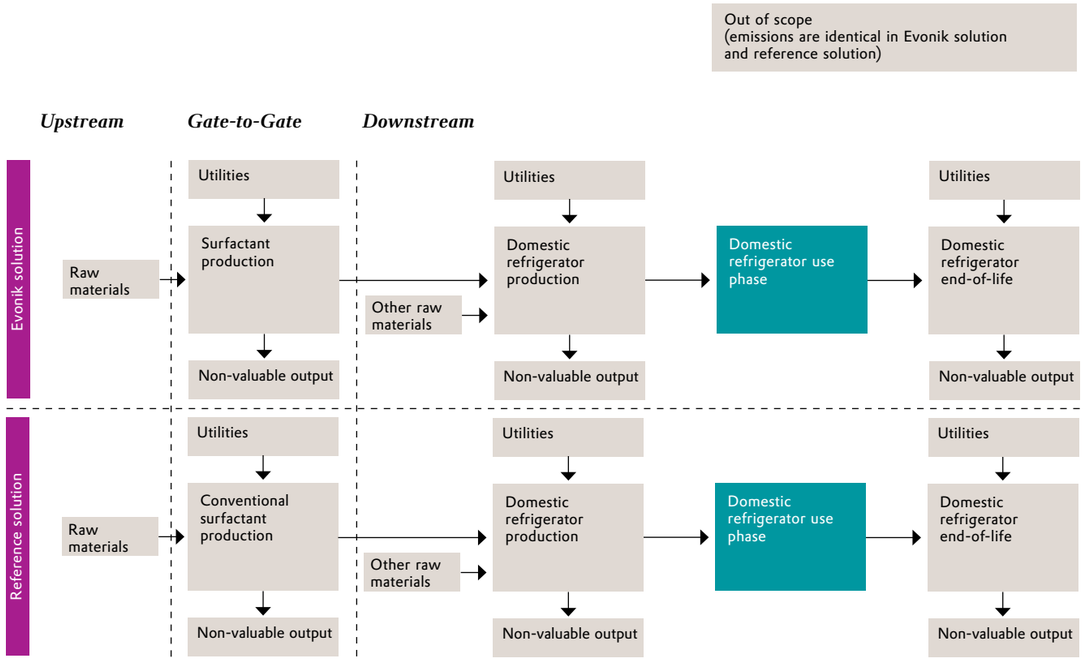
FIGURE 10: Overview of audit parameters for calculating reductions in greenhouse gas emissions from amino acids in animal feed



Reductions in greenhouse gas emissions by optimized insulating materials

Objective of the study	Calculation of greenhouse gas emissions avoided by the use of foam stabilizers in the insulation of refrigerators.
Type of comparison	Category 3 (chemical product vs. chemical product/technology)
Reference solution	Conventional, non-optimized foam stabilizers. The reference solution fulfills the same function, is at the same level of the value chain, is used in the same applications, and is interchangeable for a typical customer as a commercially available solution.
Functional unit	One metric ton of foam stabilizers in PU foam with a life expectancy of 12 years (use phase only).
Temporal and geographical reference	The savings in the use phase were calculated for the "refrigerator" use case for the USA, Europe, and China. For this purpose, the following parameters were determined for each region, to ensure that calculation of the greenhouse gas emissions saved is as regionally specific as possible: refrigerator volume, proportion of additives in the polyurethane foam, and energy consumption of the refrigerator. Using an average energy mix calculated for each region from GaBi data provided by the Sphera Solutions GmbH, it was ultimately possible to calculate greenhouse gas emission savings for the sales volumes of foam stabilizers in the corresponding regions for 2021.
Calculation method	To determine the reductions in greenhouse gas emissions, the internal Evonik Life Cycle Management team worked in close cooperation with the Comfort & Insulation Business Line of the Specialty Additives division and analyzed the use case via a Carbon Footprint Estimation (CFE): For the use of foam stabilizers the insulation of refrigerators, foam stabilizers optimized by Evonik were compared with the effect of insulation materials manufactured with conventional foam stabilizers. Energy savings were determined on the basis of suitable assumptions and converted into the thus enabled greenhouse gas emission savings. For reasons of simplicity, identical emissions (for example, those associated with the manufacture and disposal of foam stabilizers) were not taken into account. This approach had no impact on the amount of savings.
Significance of the contribution of the Evonik product to the total reductions for the application	The calculated reductions refer to the entire value chain of the selected application. However, the optimized Evonik foam stabilizers are the key components responsible for achieving reductions in greenhouse gas emission. The optimized foam stabilizers therefore make a fundamental contribution to the amount of avoided greenhouse gas emissions.
Supplementary notes	No scenario analyses for future developments were performed. Allocation of the avoided emissions to the companies involved in the value chain was not performed due to the fundamental contribution of the Evonik products.

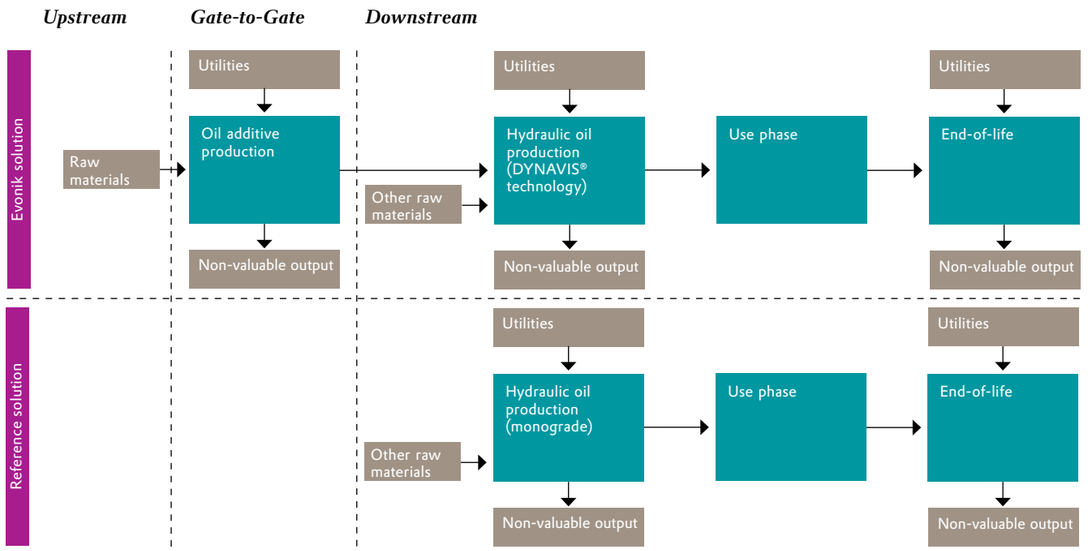
FIGURE 11: Overview of audit parameters for calculating reductions in greenhouse gas emissions from improved insulation materials (refrigerator insulation)



Reductions in greenhouse gas emissions by improved hydraulic oils

Objective of the study	Calculation of greenhouse gas emissions avoided by using DYNAVIS® technology in hydraulic oils of hydraulic construction machinery as compared with conventional hydraulic oils.
Type of comparison	Category 3 (chemical product vs. chemical product / technology)
Reference solution	Conventional hydraulic oils without DYNAVIS® technology (monograde). The reference solution fulfills the same function, is at the same level of the value chain, is used in the same applications, and is interchangeable for a typical customer as a commercially available solution.
Functional unit	Operation of a hydraulic construction machine moving 1 million metric tons of mass.
Temporal and geographical reference	The model is mainly based on data from Europe. The reference year is 2018. Savings refer to the global use of the DYNAVIS® technology. The global amount sold of the corresponding Evonik oil additives to the hydraulic oil industry in 2021 was used to calculate the total savings.
Calculation method	The internal Evonik Life Cycle Management team, working in close cooperation with the Oil Additives Business Line, has performed Life Cycle Assessments (LCA) in 2020, partly based on an earlier, externally certified LCA, to determine savings in greenhouse gas emissions. Three different hydraulic oils based on Evonik DYNAVIS® technology were compared across their entire life cycle (cradle to grave) with a conventional monograde hydraulic oil. To take the use phase into account, all hydraulic oils were used in field tests in a mid-sized excavator. While the oil drain interval of the monograde fluid is 2,000 hours, the other three fluids need to be changed after 4,500 hours. For reasons of simplicity, identical emissions (for example, those associated with the manufacture and disposal of the rest of the vehicle other than the hydraulic oil) were not taken into account. This approach had no impact on the amount of the savings determined. The DYNAVIS® technology was used less often globally than conventional hydraulic oil in 2021. Reductions in greenhouse gas emissions were calculated on the basis of emissions in the life cycles of the hydraulic oils and the fuel savings determined for the hydraulic oil based on DYNAVIS® technology (use phase).
Significance of the contribution of the Evonik product to the total reductions for the application	The calculated reductions refer to the entire value chain of the selected application. However, Evonik's DYNAVIS® technology is the key component responsible for achieving reductions in greenhouse gas emissions. DYNAVIS® technology therefore makes a fundamental contribution to the amount of avoided greenhouse gas emissions.
Supplementary notes	No scenario analyses for future developments were performed. Allocation of avoided emissions to the companies involved in the value chain was not performed due to the fundamental contribution of the Evonik product.

FIGURE 12: Overview of audit parameters for calculating reductions in greenhouse gas emissions due to improved hydraulic oils (Identical emissions for the Evonik and the reference solution that are e.g. caused during the production of excavators are not considered.)



Limited Assurance Report of the Independent Auditor Regarding Greenhouse Gas Emission Data[1] To the Executive Board of Evonik Industries AG, Essen

We performed a limited assurance engagement on the disclosures marked with a "√" (hereinafter, "Greenhouse Gas Emission Data") in the "Evonik Carbon Footprint 2021" brochure (hereinafter "Brochure") of Evonik Industries AG, Essen (hereinafter, "Evonik"), for the period from January 1, 2021 to December 31, 2021. Our engagement relates exclusively to the disclosures marked with the "√" ("Greenhouse Gas Emission Data"). These comprise avoided greenhouse gas emissions over the application life cycle of selected Evonik products sold in 2021 and the following eleven Scope 3 emission data sources:

- Purchased chemical raw materials, packaging materials as well as indirect goods and services
- Capital goods
- Fuel- and energy-related activities (outside of scopes 1 and 2)
- Inbound transports of chemical raw materials
- Disposal and recycling of waste
- Employee business travel
- Employee commuting
- Upstream leased assets (company cars, electricity and heating requirements of administrative buildings)
- Outbound transport of products
- Use of sold products (direct emissions only)
- Disposal and recycling of sold products

MANAGEMENT RESPONSIBILITIES

The legal representatives of Evonik are responsible for the preparation of the Brochure in accordance with the reporting criteria. The reporting criteria comprise in particular:

- The Corporate Accounting and Reporting Standard (Scope 1 und 2) of the World Resources Institute (WRI)
- The "GHG Protocol Corporate Accounting and Reporting Standard" and "Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Supplement to the GHG Protocol Corporate Accounting and Reporting Standard" of the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) as well as the "Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain" of the WBCSD, which are closely followed by the methodology used to account for greenhouse gas emissions.

This responsibility of the legal representatives includes the selection and application of appropriate methods to prepare the Brochure and the use of assumptions and estimates for individual disclosures which are reasonable under the given circumstances. Furthermore, the legal representatives are responsible for implementing the internal controls they deem necessary for the preparation of the brochure that is free of – intended or unintended – material misstatements.

PRACTITIONER RESPONSIBILITIES

It is our responsibility to express a conclusion on the Greenhouse Gas Emission Data based on our work performed within a limited assurance engagement.

We conducted our work in the form of a limited assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3410: "International Standard on Assurance of Greenhouse Gas Statements ", published by IAASB. Accordingly, we have to plan and perform the assurance engagement in such a way that we obtain limited assurance as to whether any matters have come to our attention that cause us to believe that the company's Greenhouse Gas Emission Data presented in the Brochure in the reporting period from January 1, 2021 to December 31, 2021, have not been prepared, in all material respects, in accordance with the reporting criteria. We do not, however, issue a separate conclusion for each disclosure. As the assurance procedures performed during a limited assurance engagement are less comprehensive than in a reasonable assurance engagement, the level of assurance obtained is substantially lower. The determination of assurance procedures is subject to the auditor's own judgement.

Within the scope of our engagement we performed, amongst others, the following procedures:

- A risk analysis, including media research, to identify relevant information on Evonik's Greenhouse Gas Emission Data in the reporting period
- Evaluation of the design and the implementation of systems and processes for the determining, processing and monitoring of disclosures, including the consolidation of Greenhouse Gas Emission Data
- Inquires of group-level personnel, that are responsible for the determination and consolidation of Greenhouse Gas Emission Data
- Inspection of selected internal and external documents
- Analytical procedures for the evaluation of data and of the trends of quantitative disclosures as reported at group level by all sites
- Evaluation of local data collection, validation and reporting processes as well as the reliability of reported data based on a sample of four sites
- Assessment of the overall presentation of the disclosures

In our opinion, we obtained sufficient and appropriate evidence for reaching a conclusion for the assurance engagement.

INDEPENDENCE AND QUALITY ASSURANCE ON THE PART OF THE AUDITING FIRM

In performing this engagement, we applied the legal provisions and professional pronouncements regarding independence and quality assurance, in particular the Professional Code for German Public Auditors and Chartered Accountants (in Germany) and the quality assurance standard of the German Institute of Public Auditors (Institut der Wirtschaftsprüfer, IDW) regarding quality assurance requirements in audit practice (IDW QS 1).

CONCLUSION

Based on the procedures and the evidence obtained, nothing has come to our attention that causes us to believe that the disclosures marked with a "√" in the "Evonik Carbon Footprint 2021" brochure of Evonik Industries AG, Essen, for the period from January 1, 2021 to December 31, 2021 have not been prepared, in all material respects, in accordance with the reporting criteria.

RESTRICTION OF USE/GENERAL ENGAGEMENT TERMS

This assurance report is issued for purposes of the Executive Board of Evonik Industries AG, Essen, only. We assume no responsibility with regard to any third parties.

Our assignment for the Executive Board of Evonik Industries AG, Essen, and professional liability as described above were governed by the General Engagement Terms for Wirtschaftsprüfer and Wirtschaftsprüfungsgesellschaften (Allgemeine Auftragsbedingungen für Wirtschaftsprüfer und Wirtschaftsprüfungsgesellschaften) in the version dated January 1, 2017 (https://www.kpmg.de/bescheinigungen/lib/aab_english.pdf). By reading and using the information contained in this assurance report, each recipient confirms notice of the provisions contained therein including the limitation of our liability as stipulated in No. 9 and accepts the validity of the General Engagement Terms with respect to us.

Düsseldorf, February 18, 2022
KPMG AG | Wirtschaftsprüfungsgesellschaft

Brandt
Wirtschaftsprüferin (German Public Auditor)

ppa. Dietrich

[1] This text is a translation of the Independent Assurance Report issued in German, whereas the German text is authoritative.

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