

Sustainability 2023

TROX





Sustainability at TROX

The TROX GROUP in 2023

Provision of fresh, healthy indoor air and our progress with regard to energy-efficient TROX technology and system solutions have noticeably gained importance in a year that was characterised by heat waves and storms. Our by far greatest investment amount to date and record sales figures confirm the effect of our resolute dedication to sustainability. We are working together with EcoVadis, the world's largest and most reliable provider of sustainability ratings for companies, aiming to further improve our level of sustainability.

SUS TAIN ABILITY

Worldwide

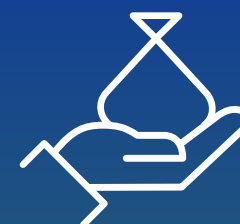
32

subsidiaries



4,932

staff members
of various nationalities



68

€ mill.
investment volume



Market leader in Europe
since the 70's, today the

global

market leader

Offering fresh air
to approx.



350

mill.* people

* by 2025



724

€ mill.
annual sales

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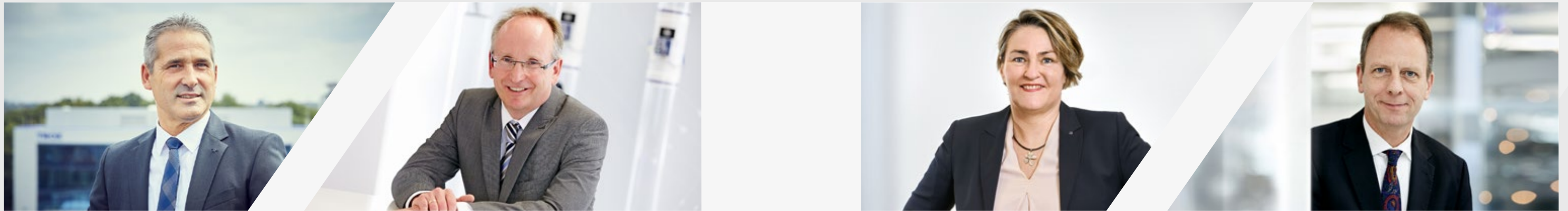
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 This QR code will take you to our website and to our detailed sustainability report.
www.trox.de/en

Sustainability perspectives at TROX



Udo Jung

Managing Director of TROX GmbH

‘We lead the way instead of merely responding. We see things through without hesitation. We choose innovation over standing still, and purposeful action over procrastination. This is how we address sustainability across the entire TROX GROUP. We are able to do so thanks to our highly motivated staff. The team has perked up noticeably, ever since we started to discuss sustainability in greater depth at our company. Everybody is dedicated to contributing and achieving something new with regard to sustainability, and that makes things easy for the management. Thank you very much for that!’

Thomas Mosbacher

Managing Director of TROX GmbH

‘Any investment in making the TROX GROUP more sustainable will strengthen our foundations for a financially, socially and environmentally sound future. In 2023 we demonstrated once more that we take our responsibilities with regard to climate and health protection very seriously, for example by investing a total of around 70 million euros, more than ever before. We did so because we have no doubt that all of us will ultimately benefit from this type of investment.’

Christine Roßkothen

Head of Corporate Social Responsibility (CSR) TROX GmbH
Board of Directors of the Heinz Trox Foundation

‘In view of the enormous negative impact that climate change has on our health, there can be no doubt that climate protection is synonymous with health protection, making it one of TROX’ primary objectives. We have always focused on promoting human well-being, after all. This is reflected in our employees’ pronounced team spirit and their willingness to move climate protection forward to the benefit of human beings, and ultimately also in the impressive sustainability development achieved by the entire TROX GROUP.’

Prof. Dr. Hans Fleisch

Chairman of the Foundation Council of the Heinz Trox Foundation

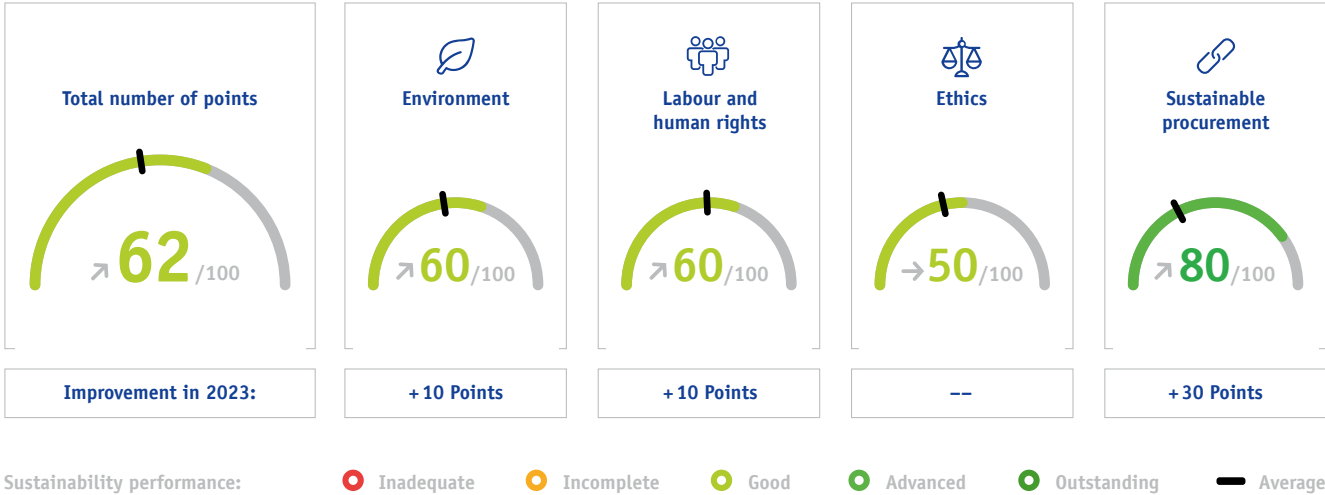
‘TROX’ sustainability efforts are in line with my personal motto in every way: actions speak louder than words. A symbiosis of loyalty to the foundation and courage to embrace change give rise to a strong drive to realise things at TROX. The goal is to serve people and their well-being and to give direction to sustainable ideas and action in a responsible way. We make the most of any opportunities to work towards a sound future for all generations.’

Excellence

The sustainability requirements companies have to fulfil are increasing steadily. We demonstrate and improve our sustainability performance through external reviews, assessments and labelling, and do so at a high degree of transparency, both internally and externally. And we are very successful at this.

TROX CREATES A TRANSPARENT ASSESSMENT BASIS

TROX GROUP – sustainability development reviewed by EcoVadis:



Improved sustainability rating by EcoVadis!
EcoVadis has evolved into the world’s biggest and most reliable provider of sustainability ratings for companies, and has created a global network of more than 130,000 assessed companies.

For the second consecutive year, EcoVadis reviewed and rated the sustainability development of the TROX GROUP in the four key categories.

The TROX GROUP was found to be among the top 35% of all companies rated by EcoVadis. According to EcoVadis this is due to our additionally realised sustainability measures, our sustainability reports and the advanced management system for sustainable procurement.

More transparent sustainability performance thanks to EPDs!
In 2023 we broke down the environmental impact of our top-selling products across their entire life cycle in the form of EPDs (Environmental Product Declarations), which we have made available for download. (see p. 58–59)

We are continuously expanding this transparent assessment basis for efficiency and eco-friendliness.



What motivates us



Global warming continues to increase and to jeopardise the most elementary aspect of human life: our health. Health protection requires honest commitment and visionary ideas. We are leading the way!

Climate change – disastrous to our health

Experts from the EU's Copernicus Climate Change Service fear that 2023 might have been the hottest year in 125,000 years from a global point of view. So far.

The negative impact of global warming and an increase in heat waves is already very tangible:

- Diseases are getting worse
- Breathlessness, coughing and weakness are more common
- There is a greater risk to the life of young children, senior citizens and people with cardiovascular problems
- Increase in severe forms of asthma, chronic bronchitis and chronic obstructive pulmonary disease (COPD)
- Heat-related excess mortality
- Changes to the effectiveness of medicines
- Increase in allergies
- Longer flowering periods give rise to longer periods of suffering
- More severe allergy-related problems due to an increase in pollen production
- New allergies are caused by new types of pollen
- Mass reproduction of harmful bacteria and micro-organisms in bodies of water
- Increase in midges, ticks, etc. that transmit serious illnesses
- Increase in heavy rainfall that causes flooding
- Irreversible glacial melting
- Thawing of permafrost soil
- Crop failures and forest fires caused by droughts



**TO PROTECT THE
CLIMATE IS TO PROTECT
HUMAN HEALTH**

Effects such as these show very clearly that anthropogenic climate change is a driver of heat-related health issues, deaths and environmental damage. The WHO considers it to be the greatest threat to human health. And so do we!

Source: Prof. Dr. med. Claudia Traidl-Hoffmann and Katja Trippel: Überhitzt – Die Folgen des Klimawandels für unsere Gesundheit. Dudenverlag 2021.



Our top priority: human health

Health is a fundamental asset. Since air is our most vital natural resource, it has great impact on this asset. Considering that we spend 90% of our time indoors, ensuring healthy, breathable air is a key aspect that we can influence. Providing fresh, healthy air for indoor areas has always been a key concern of TROX (by 2025 we will have reached 350 million* people). It has been proved that high-quality indoor air is essential to promoting the ability to focus and perform well, reducing sickness rates and maintaining good health.

This is why we harness our ability to develop visionary solutions to enable people to live healthily and enjoy good air, as well as to curb climate change. This is one of TROX' strengths, as promoting sustainability is an inherent characteristic of our products and systems.

*See p. 41 for the calculation



Determined climate action instead of red tape

We would like to see decisive action to protect the climate at the political level, and are more than willing to take such action ourselves. This involves consistent efforts to translate visions into solutions for protecting the climate in a targeted and timely manner, just like we did in the case of our new system solution TROX OX. This innovative solution features unprecedented levels of energy efficiency as well as maintenance and user-friendliness, and provides for the wide range of requirements with regard to efficiency, safety and convenience in buildings to be combined in a standardised digital system for the first time. TROX OX demonstrates once again how closely TROX technology is linked to sustainability.

Pioneering achievements such as this are equally beneficial to human beings and the environment. In contrast to the rather sedate approach employed by authorities, which tend to get tangled up in red tape in their efforts to determine responsibilities instead of addressing climate protection measures in a direct and systematic way, the industrial sector demonstrates what can be done if everyone is determined and pulling in the same direction. Climate action is possible if we continue to focus on the true goal, rather than getting lost in bureaucracy.

In addition, the TROX GROUP illustrates very clearly the power that can be set free if all staff members feel involved and everyone is willing to accept responsibility. We, and that includes all staff members of TROX around the world, are determined to protect our climate and thus our health.

OUR PIONEERING FEATS ARE BENEFICIAL TO HUMAN BEINGS AND THE ENVIRONMENT





Investment in genuine climate protection is truly worthwhile.

We are convinced that to save the climate is to save lives. This is why we intensified our investment activities in 2023, aiming to reach our climate target of an overall climate-neutral TROX GROUP by 2040.* Our highest annual investment volume in the history of TROX of 68 million euros went into photovoltaic systems, modernisation of production facilities, product innovations, electromobility, data collection, digitisation, waste reduction, social components, the construction of climate-neutral factories, and many other projects.

Furthermore, we are investing in research projects such as our paulownia plantation in Neukirchen-Vluyn. Our goal here is to assess a regionally verifiable option for a certification model, in order to offset any excess carbon emissions. This is a certification option that makes sense to us as well as being regionally beneficial. It is another way to reach our goals, and has enabled us to reach our interim targets for 2023.

*Scope 1, 2, 3 upstream

TROX' interim goals for 2023:

- Gradual tracking of carbon dioxide in Scope 3 and dynamic standardisation for the entire TROX GROUP
- E-learning platform for staff and suppliers
- EPDs for all main product series
- Detailed disposal instructions for all new installation manuals
- TROX X-FANS: commissioning of the first part of the photovoltaic system
- Neukirchen-Vluyn and Anholt: charging poles with 54 charging lockers for electric bicycles
- TROX Spain:
 - Completion of phase 2 of the photovoltaic project
 - Carpark roof with solar panels
 - Four charging stations for electric cars
- TROX Norway: commissioning of solar panels
- TROX GmbH: expansion of apprenticeship options to include ten occupations
- Introduction of a TROX staff app
- Anholt: provision of a semi-detached house for Ukrainian refugees
- Development of a concept for improving smooth realisation of customer projects

As an all-around healthy company and globally leading manufacturer of high-quality ventilation and air-conditioning technology, we take our responsibility in the areas of climate and health protection very seriously, and take action in these fields. It would certainly be possible to initiate many other urgently needed climate protection measures if greater political willingness, cooperation across disciplines and common sense were applied across all levels. This is also something we are working on together with policy makers, associations and universities – to the benefit of our health and our future.

**WE INVEST A LOT
TO ACHIEVE A LOT**

Foundation and TROX



Perfect symbiosis of economic, environmental and social aspects

As a corporate group that is linked to a foundation, the TROX GROUP does not focus on maximising short-term profits but on balanced, sustainable growth and the well-being of human beings and nature.

Thanks to our foundation links we are able to focus on human well-being in all of our considerations, decisions and changes, far more than most other market leaders. This sets us apart. Rigorous pursuit of ever greater profits is replaced with the confidence that we are building a future in which successful corporate development can go hand in hand with climate protection, social justice and mutual appreciation. This enables us to take a more holistic and less limited view of a liveable, healthy future.

Heinz Trox' motto 'The human being is the yardstick, and people's well-being is our goal' has been our guiding principle, ever since he set up the Heinz Trox Foundation as the current main shareholder of TROX GmbH back in 1991.

The non-profit Heinz Trox Foundation itself promotes scientific research of innovative ways to reduce energy consumption and produce healthy indoor air, as well as supporting various charitable and cultural projects such as the acquisition of a new vehicle for the Isselburg fire brigade. The synergy effects that develop from the foundation's activities have a positive impact on TROX GmbH's sustainability efforts on an economic, environmental and social level.

**TROX' SUSTAINABLE
ACTIONS ARE LINKED
TO THE FOUNDATION**



You can use this QR code to find out more about the Heinz Trox Foundation and its supporting activities.
www.heinz-trox-foundation.com/en



TROX highlights in 2023

The success of our TROX GROUP was reflected once more in many special projects, activities and application of the TROX values in the past year.



TROX HESCO

In March 2023, construction work begun on the new, virtually climate-neutral production facility for TROX HESCO in Switzerland: a statement of commitment to sustainability built from renewable wood in a carbon dioxide-binding design.

► Field of action 'Infrastructure' (p. 90–91)

Health

TROX exercised enormous safety and health precautions when demolishing a building containing asbestos on the newly acquired site for TROX TECH-TRADE in Czech Republic.

► Field of action 'Infrastructure' (p. 91)



Green

TROX has increased its use of green energy around the world and is covering an ever greater share of its energy demand with photovoltaic and geothermal systems.

► Field of action 'Infrastructure' (p. 88–91)



**BEHIND EVERY
TROX HIGHLIGHT STANDS
A STRONG COMMUNITY**

Together

Numerous events were held across the TROX GROUP under the motto 'together we are TROX'. These events reflected the TROX values such as mutual appreciation and shared joy.

► Field of action 'Public relations and social matters' (p. 102–103)



Diligence

TROX has implemented the German Supply Chain Act that became effective on 1 January 2023, as well as initiating various additional support offerings for its partners.

► Field of action 'Procurement' (p. 49–53)



Procurement guideline

Our sustainable procurement guideline is designed to clearly communicate TROX' sustainability requirements to our suppliers and to ensure that our values are put into practice around the world.

► Field of action 'Procurement' (p. 51)

X-mas

The team spirit and outstanding achievements of the TROX community were highlighted in a touching Christmas film. The atmospheric film was produced in various languages and featured the TROX song 'Feel it in the air'.

► Field of action 'Public relations and social matters' (p. 110)



This QR code will
take you to the
2023 TROX Christmas film

together we are
TROX



Goals

Binding interim goals help us on our way towards overall climate neutrality

Overall climate neutrality by 2040!* This major sustainability goal of the TROX GROUP is divided into manageable time periods with clearly defined interim goals.

A goal that is within sight allows for more predictable individual steps, the impression that success is within reach and for power reserves that lie dormant to be activated.

Dividing our journey towards overall climate neutrality into stages with clear interim goals that can be reached in a short period of time, makes it easier for us to reach our key sustainability goal quickly while maintaining control and motivation.

Our interim goals for 2025 are motivating for all of us but also a reminder to continue to actively pursue the TROX GROUP's sustainability development. Our achievements to date show that we can fully rely on our staff that is tackling every interim goal with plenty of motivation, creativity and dedication.

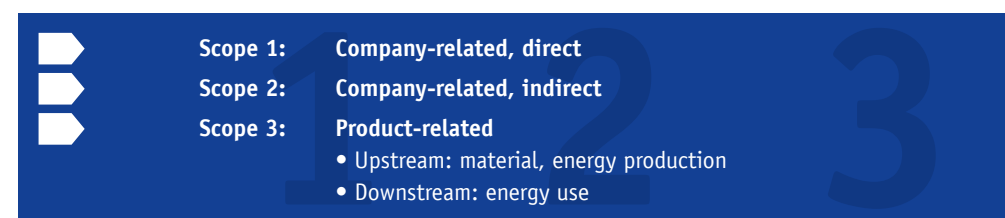
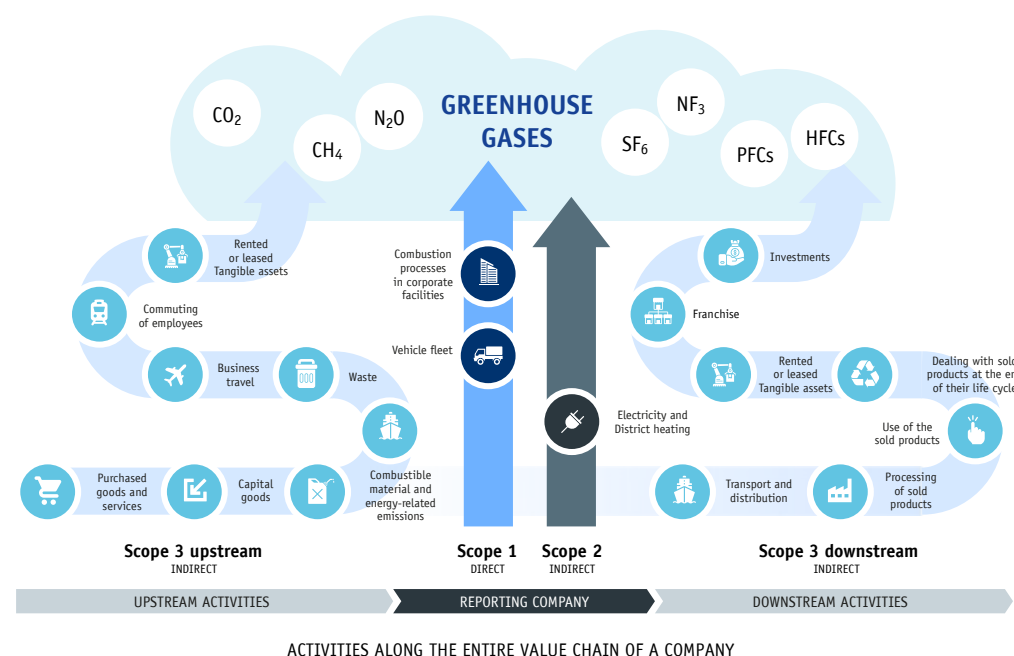
CLEAR AND MOTIVATIONAL INTERIM GOALS

Our interim goals up to 2025

Basis	I.	II.	III.	IV.
Financial stability	Healthy air	Energy + emissions	Material + waste	Employees + company
X-FIT+ programme: €800 million in sales and 8% EBIT	We offer healthy air to 350 million people	1. Our production facilities will be climate-neutral* 2. We will reduce the CO₂ emissions for our products and perform life cycle assessments 3. Thanks to our TROX system technology, our customers will save more than 1,900 GWh of energy	We will increase the recycling quota of the GmbH to 90% and introduce a globally standardised waste management system at all locations	We will review at least 90% of our suppliers for sustainability and train at least 90% of TROX employees in core areas
		 		 

*Scope 1, 2, 3 upstream

Scope classification according to the GREENHOUSE GAS PROTOCOL



Source: GREENHOUSE GAS PROTOCOL

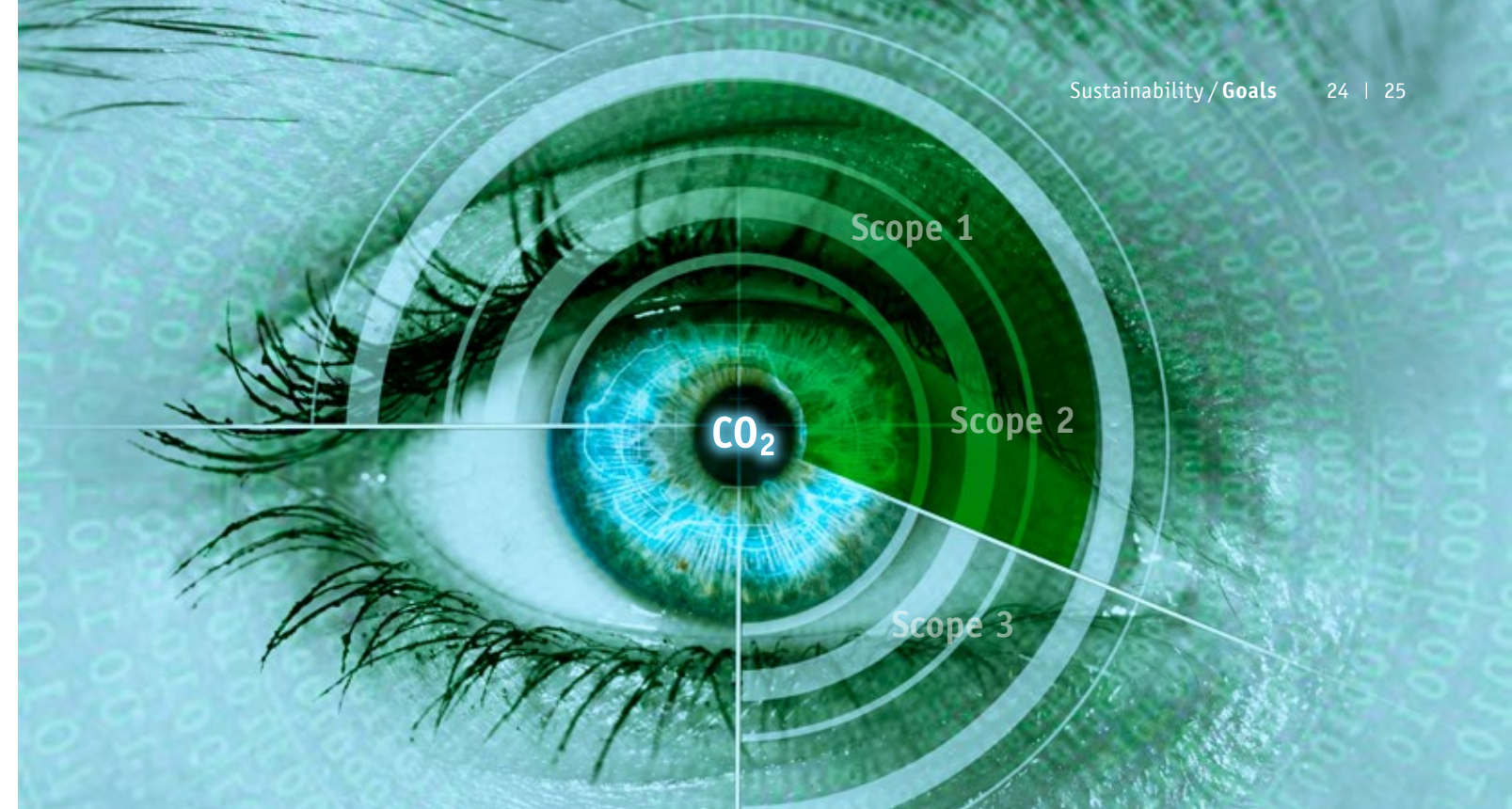
We will achieve overall climate neutrality in Scope 1, 2, 3 upstream.

Our plan to achieve the TROX GROUP's overall climate neutrality by 2040* requires us to record all of our carbon dioxide emissions.

In this context we are responsible for gathering reliable data that enables us to specifically define our sustainability-related activities. Precise recording of CO₂ emissions is therefore the starting point of our holistic, tailor-made sustainability management.

For determination of our CO₂ emissions we use the classification of Scope 1, 2 and 3 according to the GREENHOUSE GAS PROTOCOL (GHG Protocol).

*Scope 1, 2, 3 upstream



WE COMMUNICATE OUR CARBON DIOXIDE EMISSIONS OPENLY AND TRANSPARENTLY

Our CO₂ management covers the entire value creation chain.

We are able to directly influence carbon dioxide emissions that occur in Scope 1 and 2 due to our own operations. For example by using green energy, expanding our photovoltaics and geothermal systems, as well as through e-mobility, innovative digitisation processes and many other measures. We are very successful here, even if it is not always possible to directly compare all data with the previous year's results. The reason for this is not only that we are collecting increasingly detailed data, but also the fact that calculation conditions tend to evolve due to adjustments to relevant sustainability reporting guidelines.

We systematically record and reduce carbon dioxide emissions from upstream activities in Scope 3, too, even though these are much harder to control. To this end we get our suppliers involved, for example. We cooperate with them as our partners and support and encourage them in their sustainability development (see p. 49–53). This area accounts for 90% of all carbon dioxide emissions, making it the most important lever for reaching our goal with regard to such emissions.

The Scope classification according to the GHG Protocol helps us to localise the origin of CO₂ emissions within the value creation process of our products and systems in Scope 1, 2 and 3 upstream, and to draw up specific climate-protection measures.

In addition, we also consider carbon dioxide emissions that occur due to consumption of electricity for using our products and systems and those that can be avoided thanks to our highly efficient technology. In Scope 3 downstream such emissions form the category 'Use of Sold Products'. At this point our calculations are still based on average values, however, we are already achieving increasingly precise results.

We use precise data to ensure future viability.

Responsible recording, calculation and reduction of our carbon dioxide emissions enables us to draw a big step closer every year to our goal to achieve overall climate neutrality in Scope 1, 2 and 3 upstream. In this context we address the ever increasing regulatory requirements and communicate with our stakeholders in an open and transparent manner.

Exact, increasingly detailed data forms the foundation of an effective sustainability strategy. Recording and transparently balancing this data helps us to identify optimisation potential, to assess risks and opportunities, and to make any necessary adjustments in our six fields of action. The increasing level of precision and significance of our data therefore also helps to substantiate our journey towards sustainability, as well as increasing the resilience of the TROX GROUP on the long run.

The TROX
sustainability strategy

The strength of our sustainability strategy lies in its simplicity. It allows for a clear and transparent path towards overall climate neutrality.

To achieve overall climate neutrality with the help of an effective sustainability strategy, it is important to know, how much climate-harming CO₂ is produced and how it can be neutralised. To this end we have analysed the carbon dioxide emission scenarios within the value creation chain of the TROX GROUP, and we collect the corresponding data that is divided into direct and indirect CO₂ emissions.

The result is simply a matter of addition and subtraction: the TROX climate formula.

The TROX climate formula is based on a simple comparison of activities that produce carbon dioxide and those suitable for reducing such emissions. The formula is at the heart of our sustainability strategy and it makes the adjusting levers for successful sustainability development visible.

This is why we are committed to generating more and more reliable data to allow for authentic calculations. We will adjust and further refine our calculations also in future to cater for steadily increasing requirements.

This is not only how we strive to make the TROX GROUP climate neutral, but also a way to intensify our efforts to protect human beings and the environment by expanding our range of solutions for fresh, healthy indoor air and allowing for increasingly energy-efficient and thus low-carbon operation of our air-conditioning and ventilation systems.

THE TROX CLIMATE FORMULA
ENABLES US TO CALCULATE OUR
SUSTAINABILITY ACHIEVEMENTS

SUSTAINABILITY
STRATEGY

The TROX climate formula



OUR MAIN GOAL IS CLEAR: TO ACHIEVE OVERALL CLIMATE NEUTRALITY BY 2040!*

With the TROX climate formula, we can now calculate precisely how this goal can be achieved. And in doing so, we can rely on strong support from our employees around the world, who are all working to achieve the TROX sustainability goal with tremendous commitment and dedication.

THE TROX CLIMATE FORMULA

= CO₂-NEUTRAL TROX GROUP*

+ HEALTHY AIR AND CO₂ REDUCTION IN PRODUCT OPERATION

*Scope 1, 2, 3 upstream

Enhancing sustainability impact through dialogue with our stakeholders

We engage in constructive exchange with our stakeholders to allow for strong joint sustainability efforts.

We communicate with you to find out what really matters to you and what are the opportunities and problems that you associate with the issue of sustainability. This enables us to find out what we have in common and how we can assist you, as well as how we can consolidate and amplify the efforts of everyone involved.

We therefore engage in various forms of dialogue to promote cooperation with our partners.

We seek to get in touch with you in various ways including trade fairs, seminars, committees, involvement with associations and universities, printed media – such as this sustainability report – and social media platforms. We strive to make a real difference through joint sustainability efforts.

**JOINT ACTION
IS KEY TO EFFECTIVE
CLIMATE PROTECTION**



Identification of key sustainability issues for TROX

Our sustainability management is based on identification of sustainability issues that are strategically relevant to TROX. In 2023 we identified these topics based on a double materiality analysis.

The concept of double materiality was introduced as the EU Corporate Sustainability Reporting Directive (CSRD) entered into effect in January 2023. This concept represents a new approach to reporting, as the materiality of sustainability aspects is always considered from two perspectives.

The inside-out perspective

Impact of business activities on human beings and the environment
(non-financial materiality)

The outside-in perspective

Externally determined opportunities and risks with regard to business success
(financial materiality)

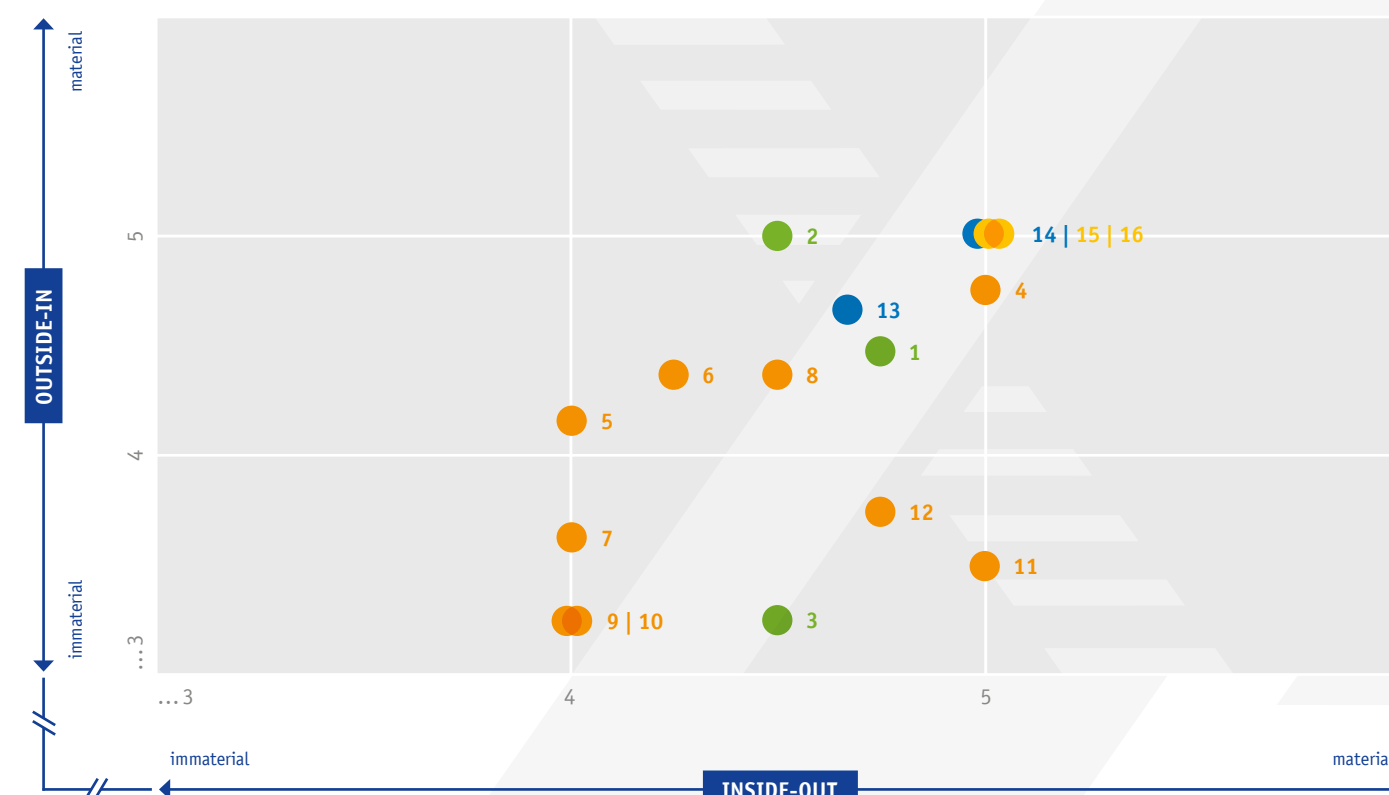
For drawing up our double materiality analysis for 2023, we compared the criteria from the previous year to the 'General requirements' from ESRS reporting (see p. 117) which we are already taking into account. By means of the workshop method, a management group of 15 individuals who are in regular contact with stakeholders, qualified a total of 88 criteria based on a top-down approach. Following an initial relevancy investigation, the management group was divided into four smaller groups that each assessed the materiality of the criteria first from the inside-out and then from the outside-in perspective, using a scale from 1 for immaterial to 5 for material. We calculated the average of the four groups' results, prepared a topic overview and eliminated topics with a relevance rating of less than 3. This allowed us to distil 16 topics from four areas that are relevant to us and our stakeholders.

These 16 sustainability topics determine our strategic actions all the way into the individual TROX fields of action.

Double materiality analysis is an ongoing process for the TROX GROUP, and the analysis will be updated annually. This enables us to ensure that our reporting remains relevant and meaningful and that we always focus our attention on the right sustainability issues.

RELEVANCY OF OUR SUSTAINABILITY TOPICS IS ANALYSED ON A REGULAR BASIS

Double materiality analysis for TROX GROUP



AREAS

Environment

1. Energy
2. Emissions (GHG)
3. Material consumption

Social matters

4. Secure employment
5. Working hours
6. Adequate remuneration
7. Work-life balance
8. Health and safety
9. Equal rights and payment
10. Training and development of skills
11. Child labour and forced labour – employees
12. Child labour and forced labour – value chain

Company

13. Corporate conduct
14. Partnerships, cooperations, industry exchange

Other aspects

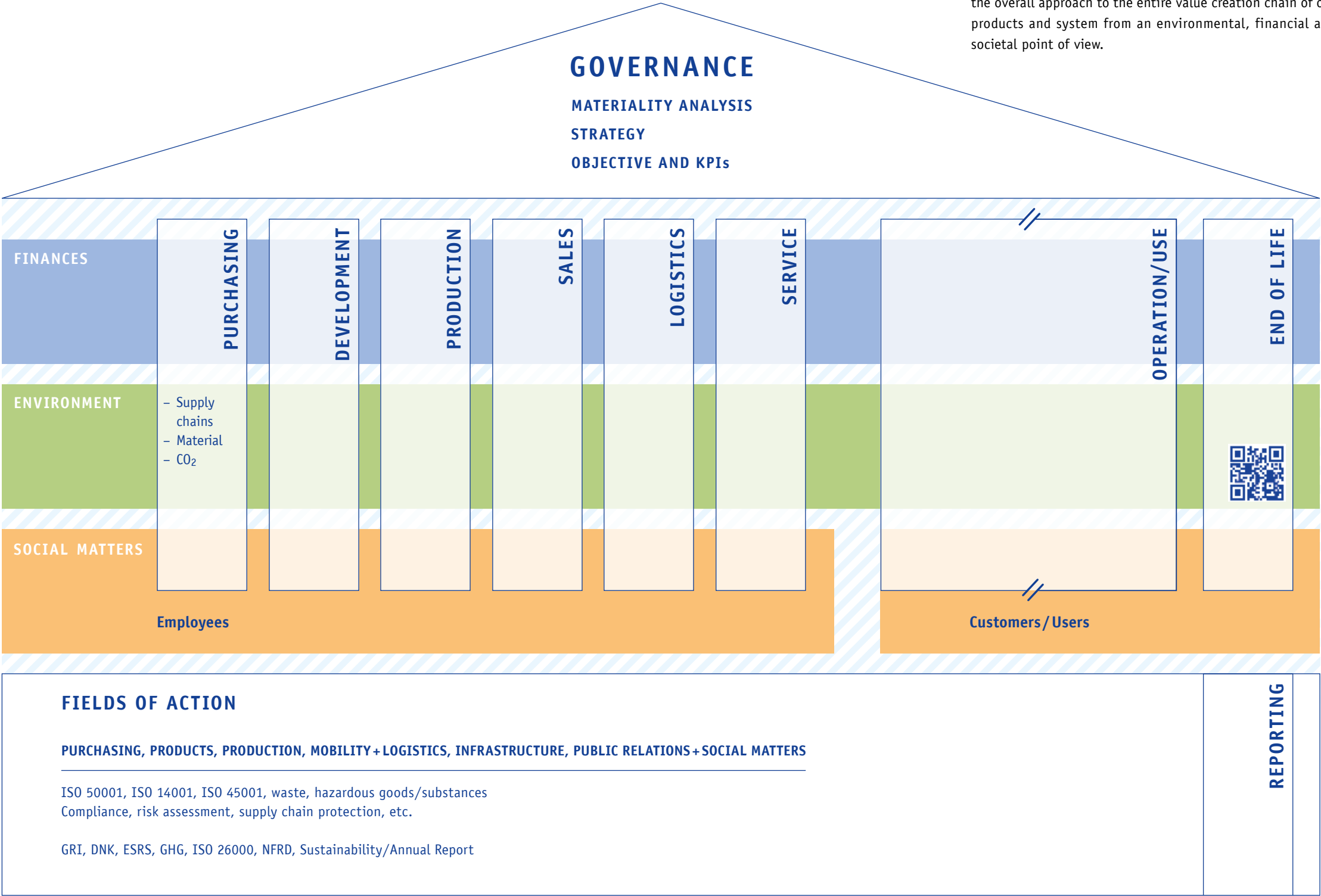
15. Health and well-being thanks to high-quality indoor air
16. Digital transformation

Responsible sustainability management

Our governance structure is set up to effectively control and monitor the TROX GROUP's sustainability development. It provides the framework for smooth cooperation of everyone involved, as well as enabling utmost transparency.

Responsible sustainability management therefore requires us to determine the topics that are relevant to us and our stakeholders in a double materiality analysis, to precisely define our sustainability strategy and goals, and to work with reliable key performance indicators. In this way, we determine the overall approach to the entire value creation chain of our products and system from an environmental, financial and societal point of view.

Our reporting takes place in consideration of common and specific rules and regulations, as well as of recognised sustainability standards. We comprehensively and transparently inform our stakeholders about TROX' sustainability development in all relevant fields of action, in particular by means of publications such as this sustainability report and the business report.



STAKEHOLDERS

– Customer-relevant sustainability metrics

– CCF (Company Carbon Footprint)

– PCF (Product Carbon Footprint)

– EPD (Environmental Product Declaration)

– Rating agencies such as EcoVadis

– Capital providers (Heinz Trox Foundation, banks etc.)

– Suppliers and business partners

– Science and universities

– Press/media

– Politics, committees and associations

– Public relations

– Employees

TROX is fully committed to the 17 goals and ten principles for sustainable development

A world in which we and future generations have sustainable social, environmental and economic perspectives: we share this vision held by the United Nations. This is why our sustainability efforts are based on the 17 Sustainable Development Goals (SDGs) of the UN and on the ten universal principles of the United Nations Global Compact (UNGC).

Shared orientation points allow for the efforts of many people to be pooled. Our sustainability efforts are aligned with the 17 Sustainable Development Goals that were determined by the United Nations in 2015. In 2022 we committed to supporting the ten principles of the UNGC.

We therefore identify with the fundamental principles of sustainability that provide instruction and structure for a meaningful contribution to supporting human beings and our planet.

TROX IDENTIFIES WITH THE PRINCIPLES OF SUSTAINABILITY



Visit the TROX GROUP's UNGC profile





The TROX fields of action

In our sustainability measures at TROX we focus on six specific fields of action.

Within our six fields of action that are relevant to the entire TROX GROUP, we adjust our sustainability measures every year to maximise their impact. To this end, each measure is carefully planned and structured based on reliable data.

This allows us to systematically draw closer to our goal to achieve overall climate neutrality by 2040*, while maintaining a certain degree of flexibility that has enabled TROX to realise great achievements with regard to environmental, economic and social aspects.

*Scope 1, 2, 3 upstream

WE ENSURE PRECISE AND FLEXIBLE CONTROL OF OUR SUSTAINABILITY ACHIEVEMENTS



We bring clarity to our sustainability activities

Strategic action is key to effective climate protection.
At TROX we define clear, transparent and comprehensible starting points for such action for each field of action.

In our strategic and operational sustainability goals we clearly set out in explicit terms, what we want to reach in the individual fields of action and which implementation strategy is to be used. Current results and developments are carefully considered here, as are topics relevant for TROX according to our double materiality analysis.

PURCHASING

Our medium-term goals by 2025: to screen at least 90% of all suppliers for sustainability and to evaluate 100% of our core suppliers in terms of sustainability, to obtain complete CO₂ transparency and train them.

To achieve this, we are implementing the following operational goals:

- We continuously support our suppliers in implementing and complying with TROX' sustainability ideas. (2)
- We expand sustainability measurement and evaluation of our suppliers using recognised platforms such as IntegrityNext. (2, 16)
- We perform extensive risk screening for suppliers. (2)
- We establish measure monitoring for risk screening of our suppliers. (12, 14)
- We oblige our suppliers to comply with our Supplier Code of Conduct and our General Terms and Conditions. (12, 13)
- We cooperate with suppliers to develop a plan to identify the need for action. (12, 13, 14)
- We create and secure basic framework conditions with internal regulations such as TROX' Global Guideline for Sustainable Procurement. (13)
- We focus on purchasing production materials with recyclable packaging. (3)
- We expand our range of sustainability training courses for purchasing and make them available to our suppliers, as well as establishing e-learning programmes available globally. (10, 12)
- We follow the principle of 'think global – act local' when selecting suppliers in order to reduce logistics and transport emissions. (2, 13)
- We buy more green energy and promote the introduction of a certified energy management system on the supplier side. (1)
- We use the TROX GROUP's RMI membership (Responsible Minerals Initiative) to ensure responsible sourcing of minerals. (3, 14)
- We promote efficient processes for sustainable procurement, e.g. inspired by ISO 20400 certification of the Neukirchen-Vluyn site. (13)

(1) to (16): see double materiality analysis, p. 33

In this way, TROX contributes to the implementation of these SDGs:



PRODUCTS

The strategic goals we want to reach by 2025 are to provide healthy fresh air indoors for 350 million people through innovative, energy and resource-efficient ventilation and air-conditioning solutions, as well as life cycle assessments for our products, and to reduce energy consumption for our customers by 1,900 GWh.

To achieve this, we are implementing the following operational goals:

- We provide
 - safe fresh air to 213 million* people through fire dampers
 - comfortable fresh air to 350 million* people through air diffusers
 - demand-based fresh air to 254 million* people through volume flow controllers
 - clean fresh air to 85 million* people through filter solutions
 - treated fresh air to 33 million* people through air handling units (15)
- We reduce the energy requirements of air handling systems in operation with optimally tailored air-conditioning components and devices and corresponding demand-based control systems, all from a single source. (1, 16)
- We develop new strategies to realise a transparent, market-driven life cycle assessment of all products. (2, 3)
- We focus on energy efficiency and resource efficiency throughout the product lifecycle. (1, 3)
- We optimise products and systems over the entire lifecycle, taking into account the frequently occurring partial load cases. (13, 14)
- We increase building efficiency through on-time, budget-compliant project implementation with TROX' complete system solutions including building automation. (1, 2, 15, 16)

(1) to (16): see double materiality analysis, p. 33

In this way, TROX contributes to the implementation of these SDGs:



*Calculated over a lifetime of 25 years for our products and systems.
Calculation for 2025.

PRODUCTION

Our strategic goal is to increase the sustainability of our production processes worldwide in terms of waste avoidance for a more efficient use of materials within the TROX Production System (TPS) and in terms of designing safe, pleasant workplaces.

To achieve this, we are implementing the following operational goals:

- We use the TROX production system TPS to improve production and administration processes across the entire TROX GROUP. (10)
- We continue to develop TROX' management system that covers the areas of quality, energy and environmental management, as well as work and health management. (1, 2, 9)
- We streamline production processes and optimise the material flow. (3)
- We reduce cuttings and waste. (3)
- We invest in hardware and software components to ensure precise recording of energy data. (1, 16)
- We use our energy audit system to improve the energy efficiency of investments. (1, 13)
- We optimise our staff members' working conditions continuously, and record and remedy potential risks. (4, 8)

(1) to (16): see double materiality analysis, p. 33

In this way, TROX contributes to the implementation of these SDGs:



MOBILITY + LOGISTICS

Our strategic goal is to reduce CO₂ emissions in the areas of logistics and transport as well as reducing the consumption of packaging materials.

To achieve this, we are implementing the following operational goals:

- We optimise warehousing to reduce specific power consumption. (1, 2)
- We continue to expand our network of production facilities to be closer to our customers. (13, 14)
- We minimise transport by establishing new production and storage facilities. (2, 13)
- We pool transport for specific regions to allow for shorter delivery routes. (1, 2)
- We gradually reduce the use of resources for packaging materials through reusable packaging. (3)
- We gradually replace our vehicle fleet with electric vehicles. (2)

(1) to (16): see double materiality analysis, p. 33

In this way, TROX contributes to the implementation of these SDGs:



INFRASTRUCTURE

Our strategic goals up to 2025 include CO₂ neutrality for our plants, a recycling rate of 90% for TROX GmbH and the introduction of a globally standardised waste management system.

To achieve this, we are implementing the following operational goals:

- We restructure our energy purchases to include a large share of energy from renewable sources. (1, 2)
- We invest in solar energy and other alternative CO₂-reducing energy sources. (1, 2)
- We compensate for remaining CO₂ emissions with validated certificates. (2)
- We set up CO₂-reduced or ideally CO₂-neutral production in all new facilities, as in the case of TROX Auranor in Norway. (2)
- We reduce primary energy and water consumption by investing in comprehensive building modernisation measures. (1, 2)
- We steadily develop our energy data recording hardware and software components to identify further measures to improve efficiency and to be able to assess the environmental performance of our processes more effectively. (1, 16)
- We develop a group-wide uniform waste management system. (3)
- We improve our digitisation concepts so that we can continue to operate digitally and in a future-oriented manner. (16)

(1) to (16): see double materiality analysis, p. 33

In this way, TROX contributes to the implementation of these SDGs:



PUBLIC RELATIONS + SOCIAL MATTERS

Our strategic goal is to consistently live up to our corporate philosophy 'The human being is the yardstick, and people's well-being is our goal' and to further establish TROX in politics and the public as the most sustainable company in the industry.

To achieve this, we are implementing the following operational goals:

- We invest in our staff members' safety, health and well-being at the workplace. (4, 8, 15)
- We promote a conscious, appreciative attitude when it comes to the diverse achievements and experiences of our employees. (7, 8)
- We refine education and further training opportunities for our employees, offer high-quality webinars, and will train at least 90% in the core areas by 2025. (10)
- We strive to realise gender equality and want to increase the number of women in leadership positions. (9)
- We strengthen the economy and the social status of our employees worldwide through fair remuneration. (6)
- We promote fairness, integrity and equal opportunities and fight corruption, discrimination, child labour and forced labour. (10, 11, 12)
- We act on the basis of our jointly developed corporate values, which we constantly reinforce through campaigns and workshops. (10)
- We intensify our active leadership and involvement in national and international associations, organisations and committees in order to enforce sustainable standards and quality requirements as well as set environmental and energy targets in the building sector. (14)
- We communicate transparently and comprehensibly with our stakeholders – digitally, via print media and in the press. (14)
- We expand the exchange of information and knowledge with our stakeholders on well-being, scientifically supported by a minimum outdoor air flow rate of 25 m³/h for good indoor air quality. (14, 15)

(1) to (16): see double materiality analysis, p. 33

In this way, TROX contributes to the implementation of these SDGs:



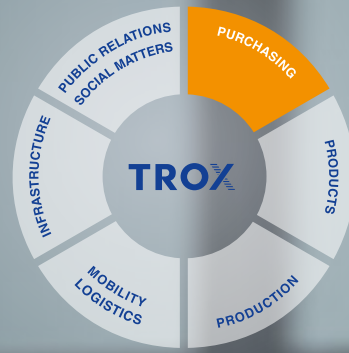
Purchasing



Pia Bossems
Purchasing Excellence, Sustainability in Purchasing

‘Sustainability is an integral part of the purchasing strategy and deeply rooted in the employees’ way of thinking and doing. Our goal is to promote eco-friendly and socially acceptable procurement. The fact that we rely on early involvement of our suppliers and global systemisation of sustainable concepts has enabled us and our suppliers to make great progress with regard to sustainability development. Our sustainability-based approach enables us to realise the TROX GROUP’s greatest potential for reducing CO₂ emissions. We are making a difference. That is something we can be proud of.’

PURCHASING



Purchasing

We focus on sustainable procurement of materials and services for the entire TROX GROUP and in this context on a transparent, sustainably structured supply chain. This contributes significantly to achievement of our goal of overall climate neutrality.

94%! This is the share of the TROX GROUP's total carbon dioxide emissions that is accounted for by the procurement of materials and services. Consideration of sustainability potential in this field of action is therefore key to our central sustainability goal of achieving an overall climate neutral TROX GROUP in Scope 1, 2, 3 upstream by 2040.

However, this requires an extremely complex and detailed approach that goes far beyond an identification of clear sustainability criteria for required materials. We also need to align our suppliers' many different and often very individual requirements and options for sustainable development with TROX' ambitious sustainability requirements, and this has to happen around the world.

In 2023 we were able to further improve the sustainability of our procurement processes at a high level of transparency, including in the supply chain. This happened with involvement of our subsidiaries and thanks to great dedication when it came to encouraging sustainability among our suppliers.

Our goal is to realise 100% sustainable procurement by 2040:

- Through CO₂ transparency
- Through climate-neutral purchased parts
- Through recyclable purchased parts
- Through suppliers that meet all of TROX' sustainability requirements



We have clarified our carbon dioxide emissions in Scope 3 upstream.

In 2023 we were able to determine our indirect carbon dioxide emissions for directly purchased materials in Scope 3 far more precisely. Our new data collection is based on two approaches:

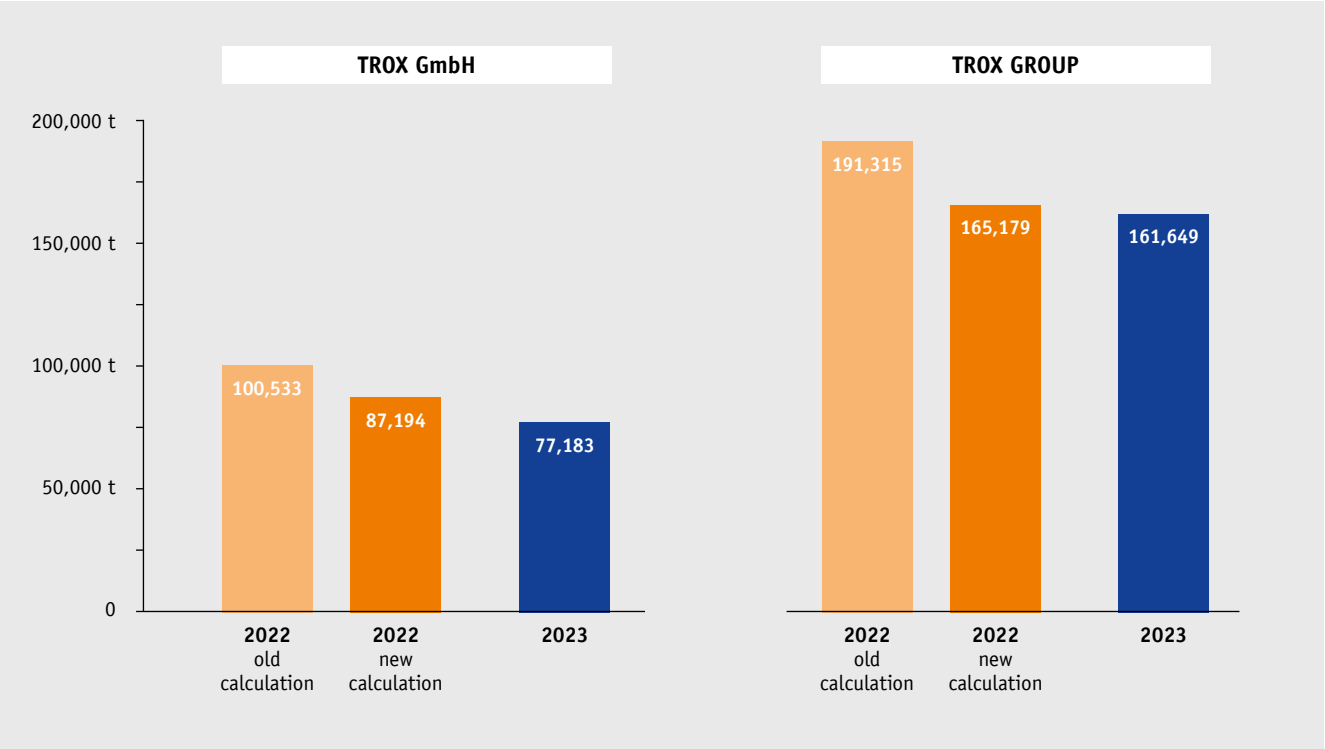
- In the mass-based approach we multiply the weight of purchased materials such as aluminium, galvanised steel or stainless steel with a reported carbon dioxide value for the raw material in question.
- The spend-based approach is applied for material groups such as electronic components, as the exact composition of such items is often not fully known. The purchasing volume of the material group in question is therefore used as the basis for the CO₂ calculation.

Based on these new calculation conditions, we have determined the figures for 2022 once again and far more precisely, and compared these to the originally calculated figures.

We have been able to take another vital step towards collecting more reliable and conclusive data around the world. This enables us to efficiently identify potential for reducing CO₂ emissions and to take even more targeted action.

PRECISION OF OUR CO₂ DETERMINATION IN SCOPE 3 INCREASED CONSIDERABLY IN 2023

Indirect CO₂ emissions from purchased materials in Scope 3 upstream



We systematically ensure that our international suppliers meet the TROX sustainability standards, too.

Since 2023 we have been precisely tracking and assessing the sustainability development of our suppliers, also for our subsidiaries. This is possible thanks to global rollout of the IntegrityNext platform. This leads to an enormous increase in transparency for our entire supply chain.

All suppliers of the TROX GROUP around the world consider 25 priorities that we have defined on a regular basis. These include:

- Environmental protection
- Human and labour rights
- Occupational safety
- Responsibility in the supply chain
- Energy management
- CO₂ emissions
- Conflict minerals

We use sustainability key indicators to analyse and assess the progress and degree of implementation of these priorities for all core suppliers. If necessary, we draw up individual support concepts in cooperation with our suppliers.

We achieved over 70% transparency in the key areas for our core suppliers around the world in 2023.

This represents a major step in active climate protection for us and our suppliers around the world, and helps to establish TROX' high sustainability requirements across the entire supply chain.

TROX' analysis of key figures for core supplier assessment

Focus area	Calculation of the key figure	Measurement frequency	Results 2023 TROX GmbH	Results 2023 TROX GROUP
Number of core suppliers assessed on the sustainability platform	Number of core suppliers assessed / number of core suppliers	Monthly	98%	89%
Degree of implementation Environmental protection in core suppliers' organisations	Completed questionnaire / assessed core suppliers	Monthly	97%	77%
	Core suppliers rated as green / number of core suppliers	Monthly	63%	51%
Degree of implementation Human and labour rights in core suppliers' organisations	Completed questionnaire / assessed core suppliers	Monthly	97%	74%
	Core suppliers rated as green / number of core suppliers	Monthly	83%	60%
Degree of implementation Occupational safety in core suppliers' organisations	Completed questionnaire / assessed core suppliers	Monthly	95%	73%
	Core suppliers rated as green / number of core suppliers	Monthly	84%	65%
Degree of implementation Responsibility in the supply chain in core suppliers' organisations	Completed questionnaire / assessed core suppliers	Monthly	92%	70%
	Core suppliers rated as green / number of core suppliers	Monthly	59%	37%
Degree of implementation Energy management in core suppliers' organisations	Completed questionnaire / assessed core suppliers	Monthly	72%	60%
	Core suppliers rated as green / number of core suppliers	Monthly	52%	36%
Degree of implementation CO₂ emissions in core suppliers' organisations	Completed questionnaire / assessed core suppliers	Monthly	89%	61%
	Core suppliers rated as green / number of core suppliers	Monthly	44%	21%
Degree of implementation Conflict minerals in core suppliers' organisations	Completed questionnaire / assessed core suppliers	Monthly	73%	60%
	Core suppliers rated as green / number of core suppliers	Monthly	63%	40%

We support our suppliers through comprehensive screening and fair cooperation.

For TROX, people always come first. This principle, along with the TROX values (see p. 102–103), also shapes the way we deal with our suppliers, aiming to create a basis for good cooperation.

To be able to assist our suppliers in their sustainability development as best we can and to monitor their compliance status, we diligently review our cooperation with them with the help of a number of portals. Before adding a supplier to TROX’ list of suppliers, we carry out reviews concerning sanctions, financial stability and general risks, in particular those related to sustainability. Regular supplier audits take place throughout the cooperation, which lead to detailed evaluations. Based on these assessments we draw up specific action plans together with our suppliers. These are documented and tracked continuously.

The rule here is that we prefer to place orders with suppliers who show particular dedication, while critical results will trigger an improvement procedure, and we may discontinue cooperation in the case of a lack of interest.

This is how we ensure that new and existing suppliers meet our sustainability criteria. In everyday business relations this also means that a quote must be prepared based on the TROX Supplier Code of Conduct, which must contain information about material compliance with regard to REACH and RoHS. Any quote must meet these requirements to be valid and considered. TROX does not automatically place orders with the supplier offering the lowest price. We will add a surcharge to the pure purchasing price, based on general risks, sustainability risks and the CO₂ factor. This is how we factor in sustainability aspects that will cause indirect or subsequent costs.

98% of TROX GmbH’s core suppliers have already been assessed in terms of sustainability; 49% of them have met our sustainability criteria. We are actively working towards improvements with those who did not.

This constructive and reliable cooperation strengthens our suppliers and aids their sustainability development.

Global rollout of the internal Sustainable Procurement Guideline

Rolling out the internal Sustainable Procurement Guideline globally in 2023, was an important step towards our group-wide sustainability development, as this has enabled us to establish the strategic content of the guideline across the entire TROX GROUP.

The Sustainable Procurement Guideline, the Supplier Code of Conduct, our General Terms and Conditions and the TROX logistics specifications are all documents that we have prepared to provide a legal framework and ensure that our values are practised around the world and that our suppliers are able to comprehend and meet TROX’ sustainability requirements.

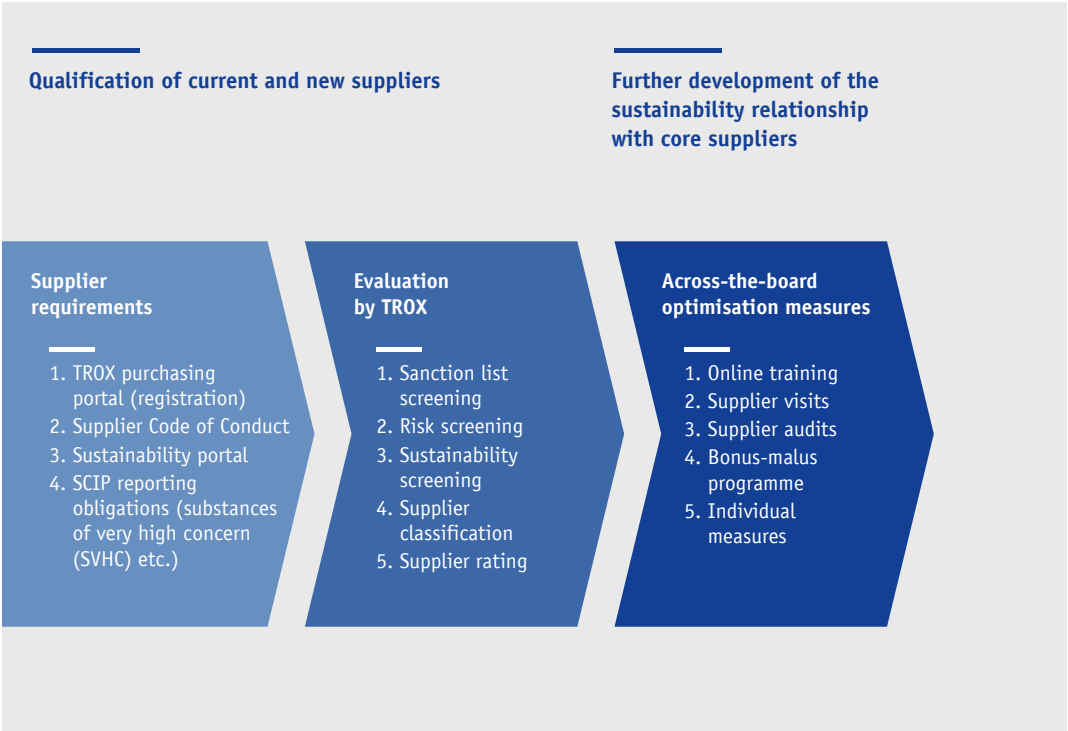
Our rules provide clarity in all key areas:

- **Sustainable Procurement Guideline**
The basic framework conditions and instructions for global cooperation are clearly defined here, e.g. basic regulations on conflict minerals and behavioural guidelines concerning the relevant topics of the TROX materiality analysis. Our Sustainable Procurement Guideline is based on the principles of the Responsible Minerals Initiative (RMI) and the International Labour Organization (ILO), on the OECD directives and the principles of the UNGC. We ensure compliance by means of internal and systemic review mechanisms. The guideline is reviewed annually and communicated to our

subsidiaries. Any adjustments and process improvements applied throughout the year are considered in this revision. Continuous adjustments are necessary, due to the fact that passages of legislation are frequently added or deleted, and we also question the validity of our processes on a regular basis.

Our Sustainable Procurement Guideline includes a separate Environmental and Conflict Minerals Guideline that ensures our suppliers’ compliance with legal provisions. Conflict minerals data is by now available from 73% of our suppliers, and the results of 87% thereof are in line with the TROX specifications.

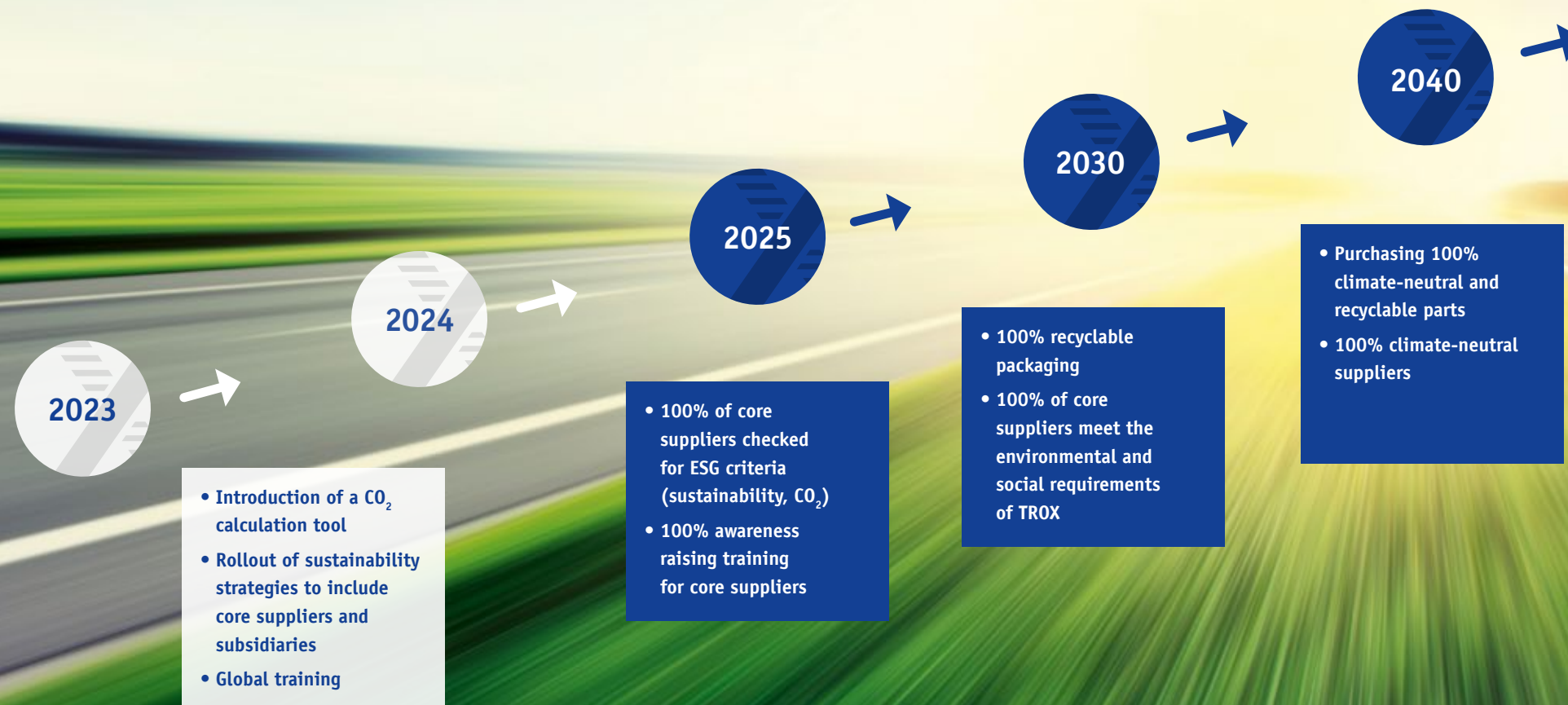
- **TROX Supplier Code of Conduct and our General Terms and Conditions**
Compliance with the TROX sustainability values that are specified here has been mandatory since 2021. We therefore will only place orders with suppliers who have agreed to this. Violations can be reported via a whistleblower system, which leads to consequences determined jointly with the supplier.
- **TROX Logistics Specifications**
This guideline regulates our requirements with regard to sustainable packaging, such as their recyclability and characteristics of padding materials. Padding material for deliveries to TROX GmbH must, for example, be unmixed and polystyrene chips and wood shavings should be avoided.



TROX USES A UNIFORM GLOBAL APPROACH TO ACHIEVE 100% SUSTAINABLE PROCUREMENT



2040 – 100% climate-neutral procurement



Our sustainability training has also been established globally.

By the end of 2023, 100% of the purchasing staff of the entire TROX GROUP had received training on the issue of sustainability. A fixed training budget was made available for each purchaser, in particular for sensitive issues such as risk management, conflict minerals and material compliance. This is how we raise awareness of the role of sustainable procurement processes among our purchasers around the world.

In addition, we have been working on an e-learning platform on which annual training for all suppliers and quarterly training for all TROX GROUP purchasers will be offered from 2024. Globally accessible training materials and multiple-choice tests are used to ensure that the learning content is internalised.

100% sustainable procurement can only be realised if everyone involved is pulling in the same direction. Our globally effective training concept is a key component on our way towards reaching this goal.

We reduce carbon dioxide emissions through short delivery routes and green energy management.

We choose our suppliers based on our motto ‘think global – act local’. Focussing on local suppliers at our locations allows us to reduce logistics and transport emissions.

We also purchase green energy increasingly, as well as investing in alternative energy sources such as solar panels and geothermal systems. Since 2015, we have been working with an energy management system certified according to ISO 50001, and since 2018 with an environmental management system certified according to ISO 14001. In addition to this, we provide incentives for suppliers who introduce a comparable system to reduce their power consumption and carbon dioxide emissions. In this context we get our suppliers involved early on to explore what is possible and streamline processes.

We want our procurement to be verifiably sustainable.

Our goal for 2024 is to obtain ISO 20400 certification for TROX’ purchasing activities.

All of these measures allow us, even in purchasing, to contribute to the realisation of the TROX GROUP’s sustainable procurement goals for 2030, which are part of the plan to realise overall climate neutrality in Scope 1, 2 and 3 upstream by 2040.

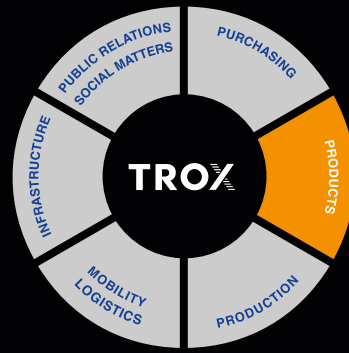
Products



Alina Buchner
Product Manager Sustainability / Material Compliance Management

‘Sustainability of products and systems has long been a part of all thought processes at TROX, and this has a big impact on our product predevelopment activities. It is part of our aspiration to achieve the highest possible degree of energy efficiency and to streamline processes while reducing CO₂ emissions. Sustainability is also reflected in our mission to offer people fresh, clean air and a healthier lifestyle as a result. We have found a way to combine technology and digitisation in particularly sustainable solutions. These are exciting prospects for a sustainable future – for TROX and all human beings.’

PRODUCTS



Products

Product sustainability is a central pillar for TROX. TROX' durable, resource-friendly, energy-efficient products and systems that provide fresh, healthy indoor air are perfect examples of sustainability that combine progress and profitability with health and climate protection.

Intense efforts to increase the company's and its products' sustainability are a matter of course for TROX as a responsible market leader in the development and production of ventilation and air-conditioning components and systems. Every day, we make sure that technology and systems by TROX are efficient, reduce energy consumption and carbon dioxide emissions, are designed in a resource-friendly way and that our mission for indoor life quality is fulfilled. To this end, we consider the entire value chain of our offerings, think outside the box and continue to create new solutions with enormous sustainability potential.

One of our key goals is to supply more and more people around the world with fresh, clean indoor air – 350 million* people by 2025 in fact. Ensuring permanently good indoor air quality is a goal that plays an important role across all development steps for our products. To achieve this, we deliberately focus on human beings and human health.

*See p. 33 for the calculation

We worked on innovative, sustainable products and systems that will help us approach our sustainability goals and make the building sector more sustainable, also in 2023.

**TROX IS SYSTEMATICALLY
ENHANCING ITS PRODUCTS'
SUSTAINABILITY**



TFEA – ceiling diffuser for extract air applications



We have reinterpreted systems to create a sustainable innovation.

It was developed internally by TROX including the corresponding software and tools, and it represents a completely new approach: the integrated system solution TROX O_x. This innovation that was presented at ISH 2023, caters for the wide range of requirements with regard to safety and convenience and eliminates interface issues through an integrated digital and efficient building automation system. TROX O_x features fewer interfaces and allows for quicker planning, realisation and commissioning, as well as increasing efficiency in operation. The perfect solution for greater sustainability in the building sector.

What TROX O_x has to offer:

- Significantly fewer interfaces
- Simple plug and play connections
- Quicker planning, realisation and acceptance
- Increased efficiency in operation

TROX O_x is going to enable users to control complex systems, as well as increasing transparency and reducing costs. In addition, the TROX CONFIGURATOR will complement the system solution as an easy to use tool for digital planning.

We are convinced that this innovative system will take the sustainability performance in the building sector to a new level. This is why it is effectively a must for us to integrate TROX O_x in our latest large-scale sustainability project – the virtually climate-neutral TROX HESCO plant in Switzerland (see p. 90–91).

EPDs for our products provide for greater transparency and sustainability in the construction sector.

An EPD (Environmental Product Declaration) constitutes detailed eco-labelling for a product. It documents the product's environmental impact across its entire lifecycle: from resource consumption through to disposal. The summary of the results of a life cycle assessment (LCA) is verified externally and is valid for five years. International standards for calculating EPDs are provided by the relevant uniform standards for their preparation (EN 15804, ISO 14044 and ISO 14025).

We accounted for our bestselling products in 2023 by drawing up EPDs, in order to provide our customers with a transparent assessment basis with regard to efficiency and eco-friendliness. At the same time, it is also a way to raise awareness among our customers, and we are already able to comply with future regulations and higher sustainability requirements in the

building sector. EPDs are expected more and more often in public procurement, as they are considered a suitable tool for assessing environmental impact. We are going to transparently report about our product's emission values to aid this certification process.

EPDs do not allow for a direct comparison of products and their environmental footprint, as aspects such as the building's context and the calculated product unit are key here. However, we do encourage sustainable construction activities and provide transparency for our customers through this decision.

Our cooperation with the certifying body EPD Norge also guarantees that high quality standards are met around the world. We are currently drawing up more EPDs for virtually all TROX product series.

These EPDs are readily available for download on our dedicated microsite.

WE ARE BRINGING TRANSPARENT SUSTAINABILITY CRITERIA TO THE BUILDING SECTOR

Trox products with EPDs (exemplary)



Smoke control damper EK2-EU
NEPD-5612-4913-EN



Multileaf damper JZ-AL
NEPD-5633-4930-EN



Fire damper FK2-EU
NEPD-5682-4950-EN



Volume flow controller RN200
NEPD-5550-4859-EN



Air handling unit X2 Nordic
NEPD-5699-4998-EN



Fire damper FKRS-EU
NEPD-5681-4953-EN



Splitter sound attenuator XS
NEPD-5634-4937-EN



Ceiling swirl diffuser VDW
NEPD-5501-4818-EN



Pocket filter PFG
NEPD-5559-4854-EN



Smoke exhaust fan BVD
NEPD-5846-5133-EN



Go to TROX' EPD microsite

Our Scope 3 calculations illustrate opportunities for reducing CO₂ emissions.

We have identified indirect emissions that occur in Scope 3 as relevant drivers of our carbon dioxide emissions. The included category ‘Use of Products Sold’ is one of the highest emission groups in Scope 3, according to our calculation drawn up in 2023.

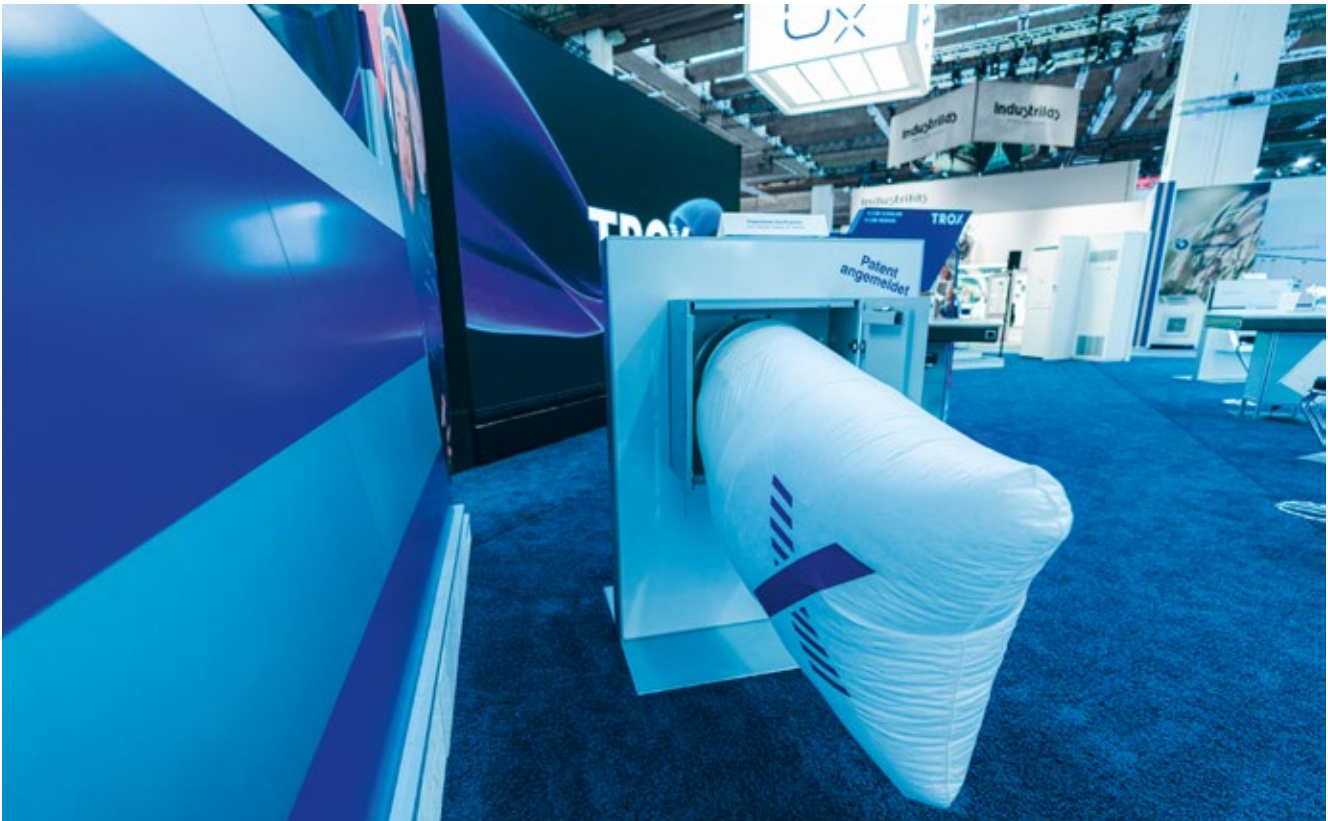
The rule that precise figures form the most suitable basis for identifying and exploiting potential for improvement applies here, too. Our TROX products are already operating highly efficiently and are low in emissions, thanks to our progress in areas including heat recovery ventilation, demand-based ventilation and digitisation. This encourages us to get even better. Our calculations are currently based on average values, but our figures will be increasingly precise in the future, also in this area.

The following CO₂ emissions shown in the graphic below are produced during the average 25-year service life of our products, based on initial projections:

In the context of these calculations it showed that TROX products are enabling our customers to make tremendous savings, for example by means of heat recovery ventilation. Furthermore, things such as energy-efficient filters and attenuators also allow for indirect reductions, for example due to reduced pressure loss. Even now, our efficient components and products allow for emissions to be reduced by around 50%.

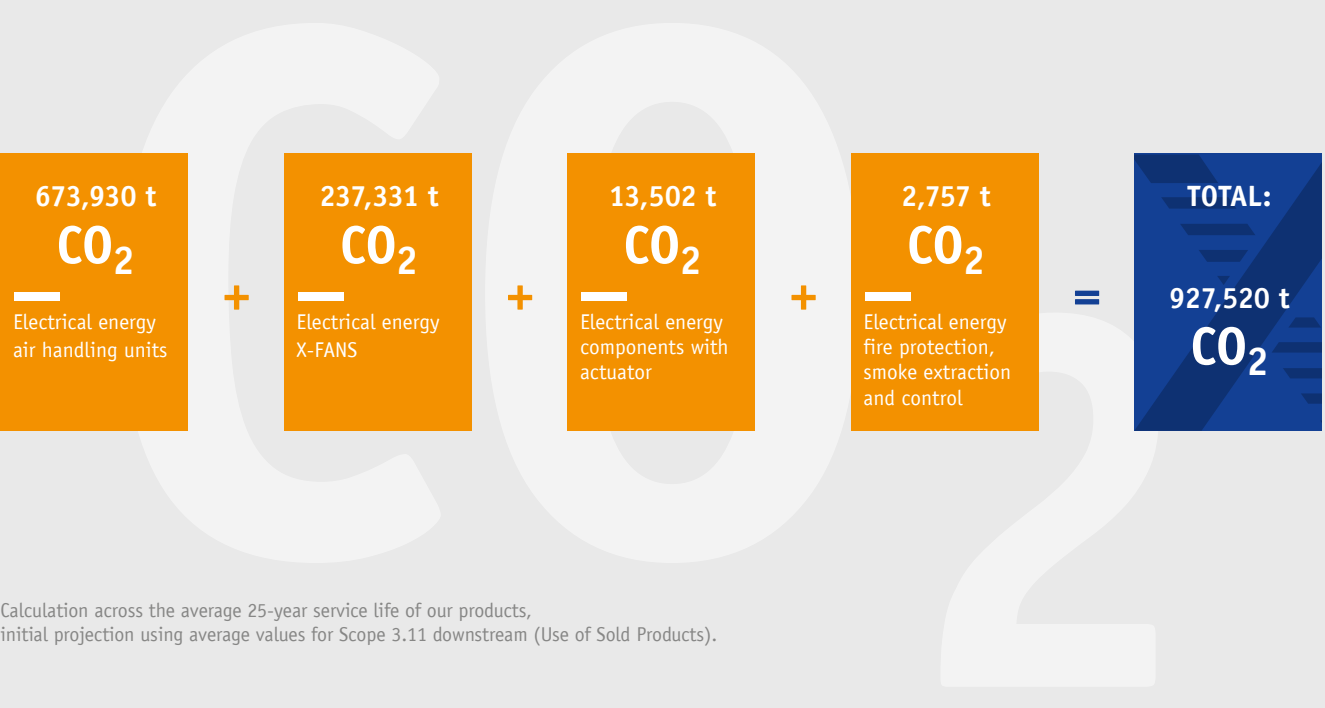
This shows that there is enormous potential to reduce energy consumption and CO₂ emissions on the product level and confirms our commitment to increase sustainability.

**TROX PRODUCTS OPERATE
EFFICIENTLY AND ARE LOW
IN EMISSIONS**



**THINKING OUTSIDE
THE BOX TO CREATE
SUSTAINABLE PRODUCTS**

CO₂ emissions by product group in the operation phase, Scope 3.11 downstream



Safe air thanks to TROX product innovations.

We have set a new standard for smoke extraction with our supply air system WAX-LI that won the product of the year award of FeuerTrutz magazine in the ‘plant fire protection’ category. In order to effectively keep escape and rescue routes free of smoke in the event of a fire, very low-pulse supply air with uniform velocity near the floor has so far been indispensable for smoke extraction with layering. To ensure this low supply air velocity in practice, large inlet areas are required in the building envelope.

With WAX-LI, TROX X-FANS is now offering a unique low-pulse supply air system that requires only small openings in the building. For smoke extraction, the system, which was developed together with the TH Mittelhessen University of Applied Sciences, can supply up to 25,000 m³/h of outdoor air with a wall opening of only 1 m².

The advantages of this are that thermal insulation of the building envelope is maintained and the building’s energy demand is minimised. Where a wall opening of more than 7 m² in size was previously necessary to allow for natural backflow, WAX-LI is equipped with a special textile hose that provides for the required increase of the surface area, while reducing the airflow velocity to less than 1 m/s. The low effort required for installation makes the system customer-friendly and it is compatible with all smoke extraction systems with layering.

This product innovation by TROX is therefore truly beneficial for our customers and the environment.



Relevant curated product information at a glance

We seek to create a new standard for our product-related documentation. We have been using a content delivery tool since 2023, which combines relevant safety aspects with our approach to sustainability that is all about reducing the burden on the environment. This tool enables our customers to quickly and simply find pages that are relevant to them. This is an option that can save them a lot of time compared to using long operating manuals, for example. In addition, it is possible to directly filter for specific information. This digital solution provides our customers with access to our product information, saving them time and effort. An immediate effect with regard to sustainability is that less documentation is produced in paper form.

**DIGITISATION OF
OUR TECHNOLOGY GIVES
RISE TO IMMEDIATE
SUSTAINABILITY EFFECTS**



Digitisation and reduction of CO₂ emissions go hand in hand at TROX.

We further advanced the digitisation process in our technology division in 2023. Standards that apply for the entire division help to improve accessibility and server performance and thus to reduce carbon dioxide emissions.

In our research project RLT-Auto (automated commissioning and monitoring of ventilation and air conditioning systems) that was launched in late 2023 in cooperation with the technical university TU Berlin, we explore which control strategies can lead to lower energy consumption, reduced wear and greater user comfort. Modern and innovative control and monitoring approaches are explored here. The goal is to improve commissioning and operation of the systems to such an extent that less energy and personnel resources are needed.

A use of heat recovery ventilation, renewable energy, demand-based ventilation and optimisation of operation allow for a reduction of carbon dioxide emissions of around 14 million tonnes and for energy consumption to be reduced by around 35%.

By advancing digitisation of our technology division, we are making use of a key element to safeguard the future of our TROX GROUP, and we are combining this with a reduction of CO₂ emissions, which helps us to draw closer to our goal to achieve overall climate neutrality by 2040*.

* Scope 1, 2, 3 upstream

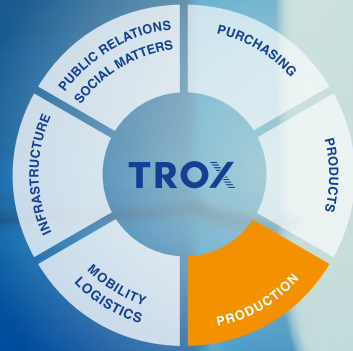
Production



Matthias Abdinghoff
Head of Production Systems Anholt

‘Our way towards a sustainable and resource-friendly future is characterised by our ambition to get better every day. This requires everyone’s commitment. The TROX production system and the lean philosophy it is based on, form the basis of our successful cooperation that enables us to identify local potential for improvement and sustainability. We join forces to use such potential and seek smart solutions to increase the efficiency of our processes, reduce material consumption and create a safe and pleasant working environment, both in production and in the office. We engage in regular exchange between the 20 production sites about our achievements and sustainable solutions. This enables everyone to benefit from our efforts to promote sustainability and environmental protection.’

PRODUCTION



Production

Safe, comfortable workplaces and increasingly energy-efficient and resource-friendly production processes: to achieve this, we rely on our own improvement system and innovative digital solutions. And it's a success!

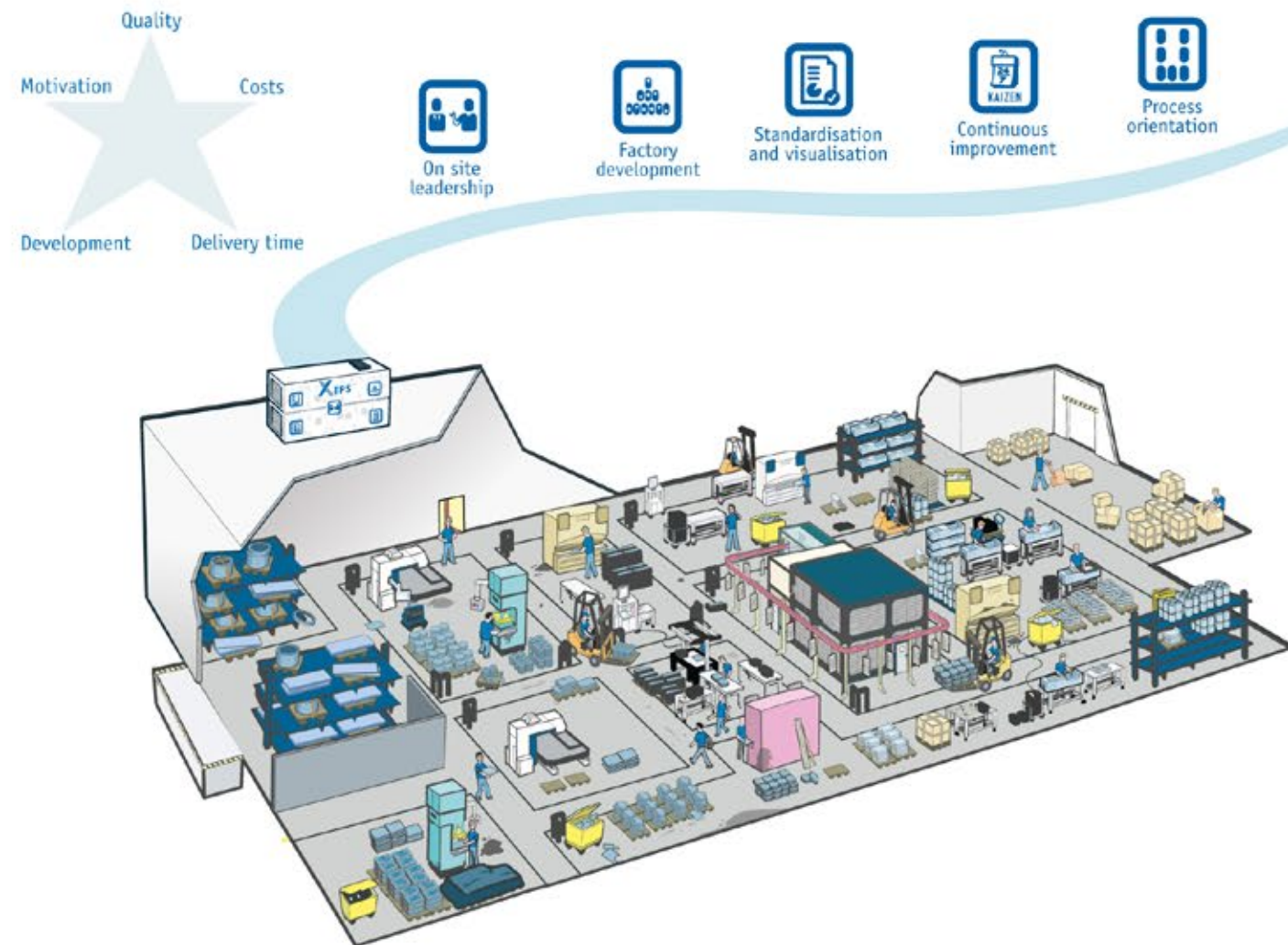
Highly efficient ventilation and air-conditioning technology by TROX is produced at 20 locations around the world by now. At each of these sites we seek to offer our employees a good working environment, optimise production processes and reduce energy and material consumption.

As part of our goal to actually operate fully climate-neutral facilities in Scope 1 and 2 by 2025, sustainability is considered in all decisions made and this inspires targeted innovation processes. To be able to exploit our full sustainability potential, we have, for example, created a very successful improvement system and we are looking for new, unconventional approaches to data collection and analysis, as well as for implementing the results in our production processes.

This is how we create solutions that benefit human beings and our facilities, are easy on the resources of our planet and help to combat climate change.

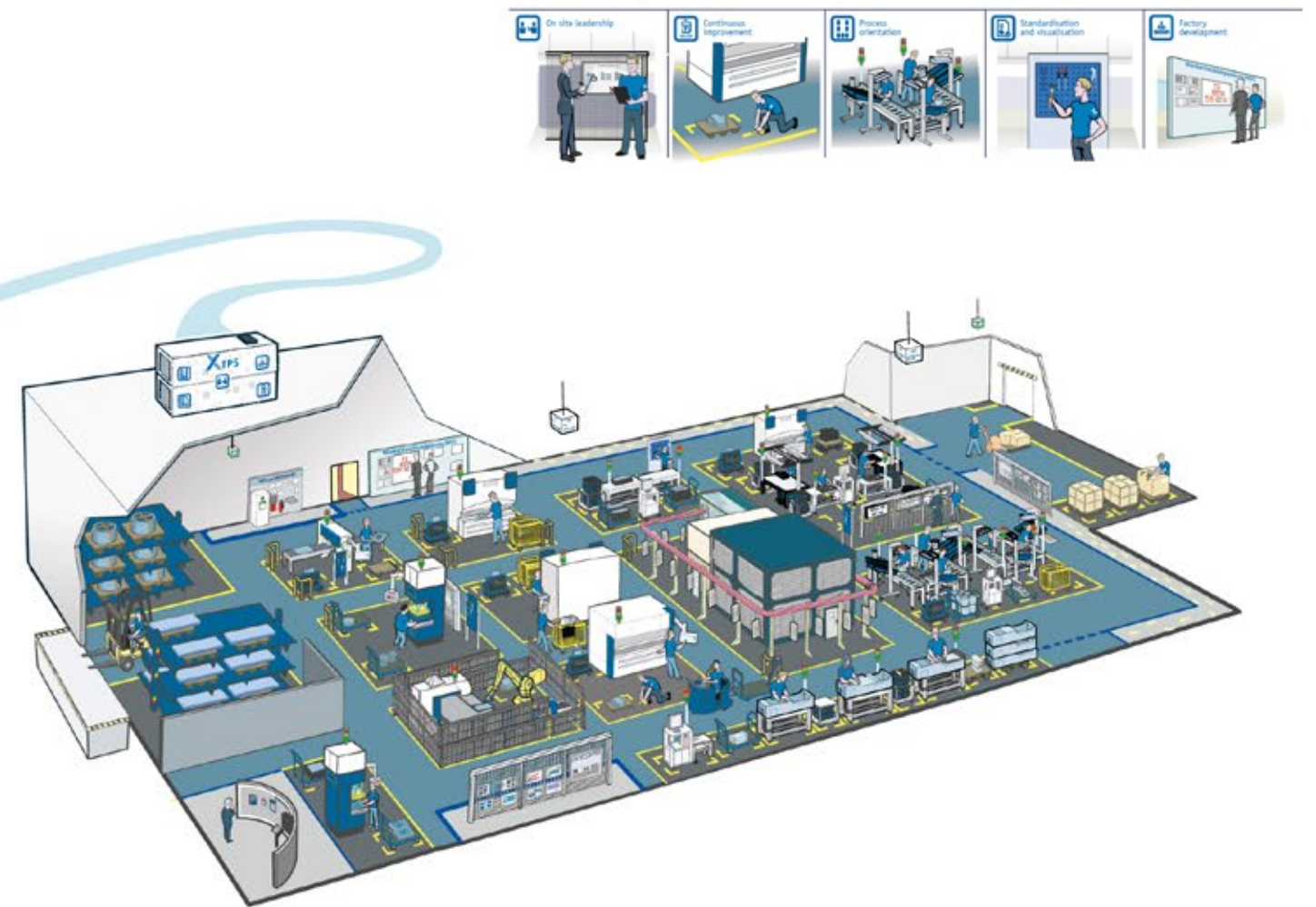
WE PURSUE INNOVATIVE SUSTAINABILITY PROCESSES





The TROX production system (TPS) activates efficient sustainability improvements.

With the TPS we align the structures and organisation of each production facility in the TROX GROUP to facilitate continuous improvement of production processes and administrative procedures. A range of improvement tools is available to be used as needed. Furthermore, annual training sessions and audits are designed to ensure that measures are implemented by competent individuals within clearly defined fields of action.



Our production facilities exchange information on an ongoing basis, for example in regular video conferences. This allows for successful improvements to be quickly realised across the entire TROX GROUP. The result are more efficient processes for all sites and systematic progress in our sustainability development.



RLT shipping process improvement workshop



TROX pursues a structured approach in which the MES is implemented in three successive stages:

Stage 1

The focus here is on precise transmission of orders at the right time to the right machine and in the right order. This precision enables us to register the exact amount of usable items and rejects for each production step, allowing us to locally quantify the proportion of waste and to gain valuable insights concerning possible process improvements.

Stage 2

The machines are connected directly to the MES to precisely monitor and analyse the machines' performance. Data such as the energy consumption per machine is particularly informative for us. Precise data recording like this makes it easier for us to derive and implement the best measures for increasing energy efficiency.

Stage 3

To be able to optimally plan resource consumption in production, we are implementing a detail planning system. This enables us to fine-tune production processes based on real-time data of order progress, machine performance and resource consumption. Bottlenecks are identified, capacities are used efficiently and unnecessary idle time is minimised.

The success of this optimisation project is based on the skills, knowledge and commitment of everyone involved. This is why we invest in continuous advancement and qualification measures for our production staff in the form of training courses that ensure a sustainable use of the new processes and technologies.

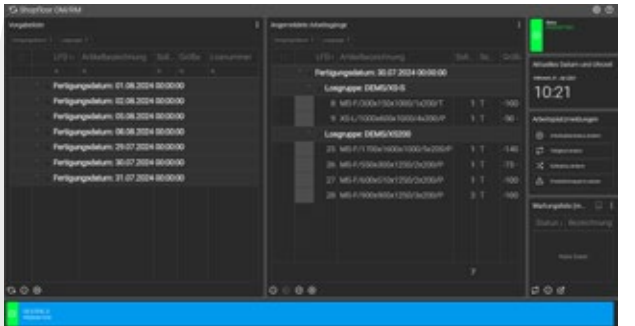
After the end of the first pilot phase, we have now reached the second phase that marks a decisive milestone on our journey towards sustainability in production. The MES enables us to reduce our carbon footprint based on precise data, and to reduce operating costs at the same time.

Our journey towards sustainability is innovative thanks to our new three-stage product digitisation, for example.

In the context of advancing digitisation and our sustainability efforts, TROX has started an important pilot project: implementation of a Manufacturing Execution System (MES). In future, this system is to act as a central registration point for production data.

The MES enables us to identify local potential for improving sustainability and is a tool for comprehensive monitoring and analysis of various aspects of production, such as waste, energy consumption and other financial and environmental key figures.

It was implemented in a carefully selected area of production in 2022. In this pilot phase, TROX was able to test its functionality in real time and to evaluate its impact on energy efficiency, resource consumption and operational processes. Our goal is to systematically analyse this data to identify further opportunities for optimisation that will help us to promote sustainable changes.



We invest in sustainable production.

By integrating our sustainability criteria in our requirements specifications, we ensure that our investments are not only worthwhile in the short-term, but will contribute to sustainable long-term development. This is why we are committed to buying efficient, eco-friendly machinery that will optimise our production processes and promote a sustainable use of resources. In addition, we attach great importance to generally record energy consumption and quantities, aiming to make resource consumption more transparent and allow for continuous monitoring.

Based on this approach, we have implemented many carefully selected sustainability measures at our German production sites.



Laser punching machine in sheet metal pre-production at the Anholt production facility



Aerosol testing station at the Goch production site

Measures taken at the Anholt production site:

- Thanks to investing in a new prefabrication method for sheet metal, we have been able to reduce steel sheet waste by 2%. At a production volume of around 1,000 tonnes per year, this corresponds to 20 tonnes less material wasted per year. Furthermore, the new prefabrication method for sheet metal involves the use of energy-efficient actuators that allow for a significant reduction of energy consumption in the production process.
- The new JZ profiling equipment also helps to significantly reduce material consumption. This innovative system enables us to save 16.7 tonnes of steel a year, thanks to the high degree of precision of profiling, as less material is wasted and resources are used more efficiently. In addition to this, the new JZ profiling equipment also provides for a high degree of process reliability.
- The result of TROX' highest ever investment in machinery is a top-modern housing production line for fire protection and control products. Hydraulic components are replaced with electric ones in this innovative equipment, and this allows for more efficient production and a reduction of energy consumption by some 170 MWh per year. The proportion of waste is also reduced by 1%, allowing us to save 15.55 tonnes of steel every year.
- In our 2023 potential analysis we also identified two surface coating systems that could be operated far more sustainably if they were converted to be powered with green electricity instead of gas. We are currently reviewing feasibility.

**WE DON'T LEAVE
SUSTAINABILITY TO CHANCE**

Measures taken at the Neukirchen-Vluyn production site:

- 2023 was a record-breaking year for our Neukirchen-Vluyn factory with sales of EUR 73 million. With a firm focus on resource efficiency, we carried out comprehensive layout and process changes as part of our continuous improvement activities and various optimisation projects.
- A layout change in pre and final assembly of active chilled beams has enabled us to save 15 logistics shifts per year.
- Shuttle cars between the Neukirchen-Vluyn and Anholt sites allow for a reduction of packaging materials and greater value creation.
- The medium and long-term focus of our Neukirchen-Vluyn production facility is determined on a weekly basis in our factory development plan. Sustainability projects and further development from component producer to high-tech centre for decentralised ventilation technology are our top priorities. To be able to effectively realise these goals, we have further expanded the production development project team.
- Further measures for increasing sustainability were planned in 2023:
 - Installation of water dispensers which provide for a reduction of carbon dioxide emissions of 86% compared to bottled water, thanks to using a natural refrigerant, minimising internal and external transport routes and reducing plastic use. In addition, they are more convenient for our staff members.
 - New furnace systems are going to reduce energy consumption for surface treatment and powder coating by up to 35%. By switching from natural gas-powered furnaces to a dual system (electricity and natural gas), we are taking another step towards independence from fossil fuels, while covering part of our electricity demand with our own on-site photovoltaic system.
 - Following the planned refurbishment of our facility roof, improved insulation will reduce the burden on our production staff in summer, as the factory does not get as hot, while we will be able to make heat energy savings in winter.

Measures taken at the Goch production site:

- By switching from paraffin oil to fog fluid, we were able to eliminate a potential health risk for our production staff. We have therefore completely eliminated a potentially respirable hazardous substance from our production activities to create a safe working environment.
- In order to eliminate around 30% of all PU adhesive components across all product series, we have taken various measures including constructive changes to the MFC-RD filter, adjustment of assembly procedures and changes to the adhesive application procedure.
- By switching to hot melt glue, we were able to reduce energy consumption by 21% on three machines.
- New lifting equipment was installed to improve workplace ergonomics. This additional support tool reduces the strain on our staff while increasing production process efficiency.

Measures such as these contribute to minimising energy consumption and waste and to a more efficient use of precious resources. They allow for considerable cost reductions, make our production activities more cost-efficient and allow for comfortable, safe working conditions.

Our indicators allow for reliable assessments.

Assessment of our measures based on indicators helps us to measure our achievements and to identify areas where improvements are required or possible. These include material and energy consumption for each production facility.

Regular monitoring and analysis of these indicators allows us to identify trends and potential for increasing efficiency, as well as to take targeted measures. At the same time, these indicators are used as guidance for our strategic approach and they help us to reach our sustainability goals. Through our ongoing efforts to improve these indicators, we are able to ensure that our sustainability work is effective and has a positive impact on human beings and the environment.

Mobility and logistics



Natalie Licht
Functional Area Manager Logistics & Production Processes
Customs Manager

‘Sustainability issues are a fixed item in our projects and our organisation. And you can really tell, for example, by how it changes our travel habits and accelerates expansion of electric mobility. We rely on pooling strategies to reduce transport, require our forwarding agents to act sustainably and use more and more eco-friendly packaging, which also includes protection against invasive species. Sustainability on a global scale is an ever-present issue at TROX. After all, there should be no borders when it comes to climate protection.’

MOBILITY LOGISTICS



Mobility and logistics

In our field of action 'Mobility and logistics' we focus on sustainability with regard to travel, logistics structures and transport packaging, in order to gradually reduce CO₂ emissions and improve eco-friendliness.

Rising awareness of sustainable processes in the TROX GROUP means that each staff member has a keener eye on how we travel, how logistics can be structured in a responsible and future-oriented manner with involvement of our carriers, and how protecting the environment and the climate is pursued in practice with regard to transport packaging.

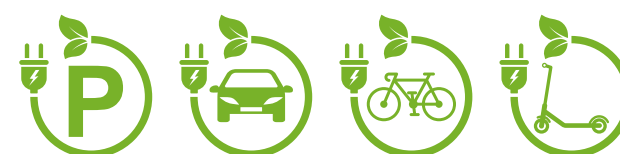
We are building on this mindfulness in order to effectively improve our sustainability performance.

We are gradually increasing our use of electric mobility.

We are gradually transitioning from cars with combustion engines to electric vehicles, and this is also true of our subsidiaries. To cater for the increasing number of electric cars, TROX UK installed six charging stations in 2023, which are powered using the company's photovoltaic system that was also taken into operation last year. At our sites in Neukirchen-Vluyn and Anholt we have leased three more electric cars and bought another two, and have thus expanded our vehicle fleet to include eleven electric cars and four hybrid vehicles.

We are continuously working on this future-oriented approach to transition our vehicle fleet to electric vehicles. This also includes charging lockers for privately owned and leased electric bicycles of our employees who cycle to work.

**EVERYBODY AT TROX
IS COMMITTED TO ADVANCING
SUSTAINABLE PROCESSES**



We strive to reduce CO₂ emissions also in air travel.

Around 812,000 km were travelled by plane by the TROX GmbH in 2023. The total of 469 flights included 120 domestic and 349 international flights accounting for 213 t of carbon dioxide emissions.

A comparison to the previous year is not possible as we have now adopted the CO₂/THG calculation model by myclimate.

With regard to CO₂ emissions caused by our flights we have converted our points from flights booked and paid with a company credit card since 2017 into an SAF certificate as part of the Lufthansa-PartnerPlusBenefit programme in 2023 (image on the right).

SAFs (Sustainable Aviation Fuels) are made from biogenic residual material such as edible oils and are already being added to the fossil fuel kerosene in small amounts. The amount of SAFs available globally is still very low and their cost is several times higher than that of standard aviation fuel. However, it is products such as these that can lead to change and we are therefore happy to support them. The Lufthansa Group ensures even now that customer requests for SAFs, such as ours, are met. By converting its points, TROX was able to generate a CO₂ reduction of 2.732 t. With this step we are also supporting the development of eco-friendly aviation fuels.



We more than doubled our CO₂-neutral train journeys.

Business travel by train is becoming more and more common at TROX. The person kilometres (PKM) travelled by train more than doubled for the second consecutive year, from 95,717 to 203,996. Compared directly to travel by car, we reduced CO₂ emissions by 44 tonnes in 2023.

WE DELIBERATELY PLAN BUSINESS TRAVEL IN A SUSTAINABLE MANNER

Number of flights and CO₂ emissions of TROX GmbH in 2023

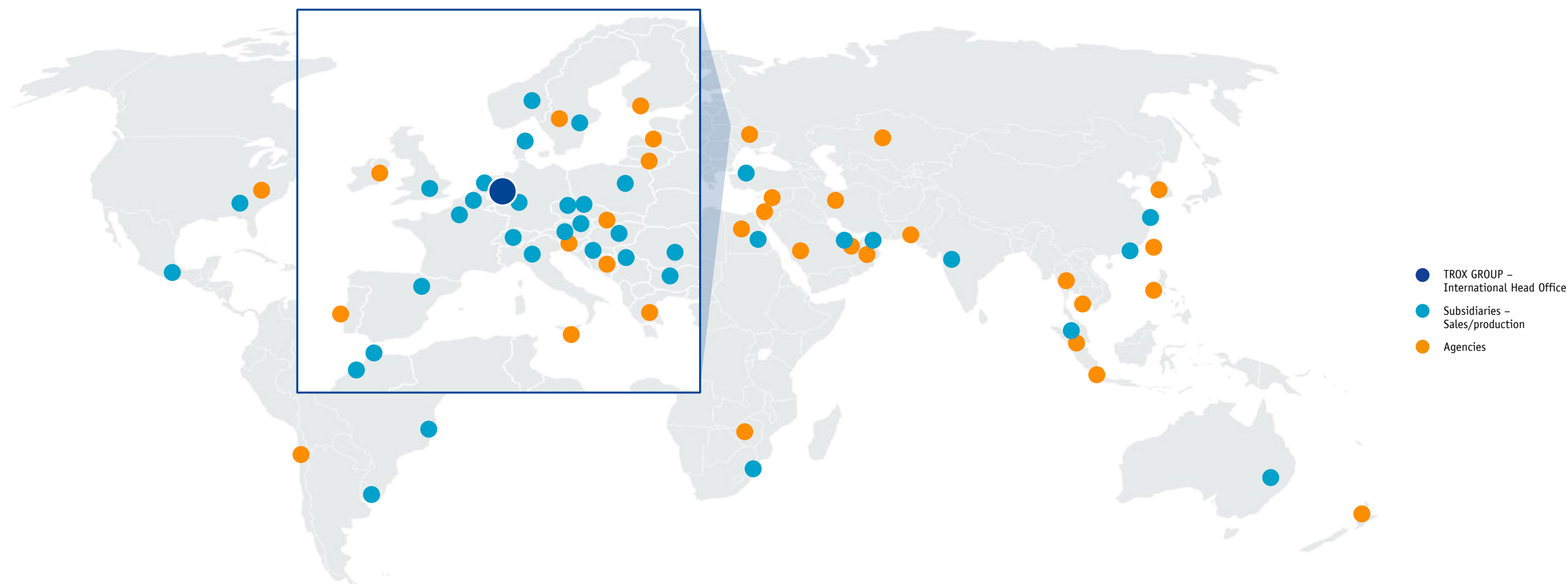


CO₂ savings of TROX GmbH through train usage



	PKM*	CO ₂ emissions	CO ₂ savings
2021	43,003	0	6,876 kg
2022	95,717	0	20,684 kg
2023	203,996	0	44,492 kg

* Passenger kilometres travelled



Pooling transport to reduce the distance travelled

We operate 20 production facilities around the world and strive to reduce carbon dioxide emissions when transporting our products. To this end we systematically pool our deliveries to allow for short delivery times and a reduction of the distance travelled.

This strategy also applies to supplier transport within the TROX subsidiaries, where relevant. We have, for example, permanently reduced air freight from China by pooling sea freight. These transports are tracked in coordination with our dispatchers and purchasers. In order to permanently reduce air freight from China to an absolute minimum, we are going to continue pursuing this low-carbon pooling approach in the area of Chinese logistics, including regular sea freight tracking.

The pooling approach is also applied by our warehouses to allow for a reduction of distances travelled in internal factory traffic. To this end, we make sure that goods that belong together are stored close to each other. Optimisations such as these enabled us to reduce the amount of rented warehouse space by a total of 2,400 m² in 2023.

To be able to quickly react to our customers' requests and reduce carbon dioxide emissions at the same time, we want to offer our subsidiaries even greater support in optimising their logistics activities in line with their individual requirements. In 2023 we therefore started an initiative based on the 6-R-rule of logistics to analyse the following six aspects for each of our subsidiaries:

1. Which product (right product)
2. How much (right quantity)
3. At a certain point in time (right time)
4. Meeting certain requirements (right information)
5. At the right costs (right costs)
6. Needed in which target country? (right place)

Flexible analysis is necessary to adjust logistics and pooling concepts to different conditions. As a global player we are taking the opportunity to benefit from positive experiences made by individual subsidiaries, in order to ultimately reduce transport distances for all sites of the TROX GROUP and therefore contribute to climate protection.

**OUR LOGISTICS AND
POOLING CONCEPTS ALLOW
FOR SHORT ROUTES AND
HELP TO REDUCE CO₂ EMISSIONS**



Wooden rather than styrofoam feet for transporting TROX splitter sound attenuators



Recyclable, foldable transport box for filter frames

We expect our carriers to be dedicated to sustainability.

In our pursuit of sustainable standards we take the environmental and social sustainability status into account when choosing new carriers, as well as with regard to existing partnerships. Sustainability issues such as these are considered in any new transport tenders:

- Does the carrier have external sustainability certification, e.g. from EcoVadis?
- Is a THG emission certificate available?
- Which sustainability measures are being realised?

Carriers who can demonstrate appropriate commitment and certifications as evidence of their willingness to accept responsibility with regard to sustainability are awarded bonus points that will increase their chances of being awarded orders.

**WE ACCEPT RESPONSIBILITY
AND EXPECT THE SAME FROM
OUR CARRIERS**

Safe and sustainable transport packaging

TROX has introduced a number of smart packaging ideas in the past that allow for our products to be transported just as safely as before but far more sustainably. We are currently exploring alternatives to film wrapping for our filters.

Setting up our new filter warehouse for TROX KS Filter in Pribram, we are taking the opportunity to work on our packaging concept. Our new, optimised cardboard packaging is designed to provide demand-based packaging for which less material is needed, while the amount of empty space is reduced. This means that we are transporting less air, utilising our lorries more effectively, and therefore needing fewer trips and reducing carbon dioxide emissions.

With regard to transport packaging, sustainability also means to eliminate any environmental impact in a responsible way. In order to rule out wood pest infestation that could pose a serious threat to forests, we make sure that heat treatment according to ISPM No. 15 is applied to the solid wood packaging that is preferred in international goods transport. This way we can reliably prevent that any pests are introduced to other countries.



Infrastructure



Christian Knufinke
Head of the Energy and Environmental Management Division

‘The great effectiveness of our sustainability measures in the area of infrastructure encourages us to try and achieve even more across the whole group. It is a joy to see roof surfaces being used for photovoltaic systems across the TROX GROUP, how the goal to reduce CO₂ emissions is part of any structural refurbishment or optimisation, and also how great innovative ideas are being developed. We rely on comprehensive concepts when it comes to digitisation, too. The success is really visible and so is the impact with regard to reducing CO₂ emissions. This means that a sustainable future of the TROX GROUP is within reach. It is a realistic goal and a worthwhile investment for all of us.’

INFRASTRUCTURE



Infrastructure

Reduction of carbon dioxide emissions, climate-neutral production facilities, minimising waste and innovative, future-oriented development of digitisation: these are some of the sustainability ideas that we pursue for the entire TROX GROUP as part of our field of action ‘Infrastructure’.

We believe that future viability of the TROX GROUP is closely linked to the status quo of our sustainability development. As a solid, healthy corporate group we therefore invest in infrastructure that promotes our transformation towards overall climate neutrality through sustainable solutions.

We are making enormous efforts to ensure that our factories around the world will be overall climate neutral in Scope 1 and 2 by 2025. New buildings are therefore planned sustainably from the start and our existing buildings are being reviewed with regard to their sustainability potential and are gradually refurbished or optimised. This includes that we are increasingly covering our energy needs with green energy.

We are still enhancing our data collection activities to be able to precisely determine and assess our carbon dioxide emissions and the reductions we have achieved to date. This is used as a basis for developing further measures and ensuring long-term health and stability for the TROX GROUP. Thanks to carefully planned measures we have been implementing since 2015, we were able to considerably reduce our CO₂ emissions in relation to our sales figures once more in 2023: by 60.2% for TROX GmbH and by 56.7% in the entire TROX GROUP. This corresponds to a reduction of carbon dioxide emissions of 5,748 tonnes achieved by the TROX GROUP.

OUR CO₂ EMISSIONS IN SCOPE 1 AND 2 ARE GOING DOWN YEAR BY YEAR

CO₂ emissions of TROX GmbH

TROX GmbH	2015	2016	2017	2018	2019	2020	2021	2022	2023	> 2025
CO ₂ emissions (t)	6,514	6,625	6,769	6,719	6,645	6,958	4,952	4,256	4,189	1,073
CO ₂ emissions (t) per million EUR net sales revenue*	29.0	28.6	29.1	26.4	24.0	25.7	16.2	13.4	11.5	2.9
Change (%)						-11.2	-44.2	-53.8	-60.2	-90

CO₂-Ausstoß der TROX GROUP

TROX GROUP	2015	2016	2017	2018	2019	2020	2021	2022	2023	> 2025
CO ₂ emissions (t)	16,099	16,180	15,815	16,257	15,879	16,394	16,454	13,204	10,351	5,647
CO ₂ emissions (t) per million EUR net sales revenue*	33.1	34.3	32.4	32.1	29.3	31.2	27.1	19.7	14.3	6.9
Change (%)						-5.7	-18	-40.3	-56.7	-79.1

From 2023: including car emissions. *Up to 2022: invoiced amounts.

Legend: Between 2015 and 2023, TROX GmbH reduced its CO₂ emissions in Scope 1 and 2 by 60.2%: from 29 tonnes to 11.5 tonnes per 1 million euros net sales revenue.

We continually invest in precise data collection.

Based on increasingly extensive data collection, we initiated and realised various measures worldwide, also in 2023. These allow us to make progress on our path towards overall climate neutrality. A significant increase of data collection at our German sites has helped us to achieve ISO 50001 certification for 2023, as well as highlighting the progress we are making in this area.

To be able to add further measurement points at the Anholt site, we replaced the hardware busmaster with a virtual server in early 2023, for example. Another thing we did at the start of the year was to modernise power distribution in the administration building in Neukirchen-Vluyn, allowing us to centrally collect energy-related data. This modernisation simplifies determination of performance indicators and analysis of energy consumption. A new communication module for compressed air control allows for precise recording and transmission of pressure consumption data in Factory 1 in Neukirchen-Vluyn. This technical upgrade does not only allow us to track compressed air consumption in real time, but also to perform analyses and evaluations.

Detailed planning has been drawn up in 2023 for a further upgrading of measuring counters. This modernisation is going to enable us to make reliable statements about the plant's energetic quality based on the recorded data and influence factors and to assess production and non-production-related consumption more clearly.

Our goal is to generate an increase in efficiency through better monitoring and assessment and to detect potential to make savings early on.

We were able to translate the sustainability potential of our German sites into effective measures in 2023.

Our implemented and planned sustainability measures are geared towards achieving a measurable reduction of TROX' carbon footprint.

Solar/photovoltaic systems

More and more photovoltaic systems are being installed on the roofs of TROX buildings, and this helps to increase the amount of green energy that we produce and use. Installation of this type of system was completed at our sites in Neukirchen-Vluyn and Anholt in 2023. They are scheduled to be taken into operation in the second quarter of 2024. For Anholt alone we expect that 1,258 MWh will be generated per year. Parts of the photovoltaic system of TROX X-FANS in Bad Hersfeld were taken into operation in 2023, and full commissioning is to take place in 2024. We expect that 485,460 kWh of electricity will be generated per year.

Geothermal plants

We have been using geothermal energy for heating and refrigeration at our Neukirchen-Vluyn and Anholt sites for a long time – since 2012 in the case of Neukirchen-Vluyn. Expansion of the geothermal plant at the Anholt site was planned in combination with a heat recovery system in 2023, aiming for the gas-powered cogeneration unit to be taken out of operation on the long run. This is another sophisticated building block on our way towards using fossil-free energy sources. Large investments such as these are complemented by many little measures that are also very effective, such as insulating the water and heating pipes at the Neukirchen-Vluyn site.



WE ARE INVESTING MASSIVELY IN RENEWABLE ENERGY AND ELECTRIC MOBILITY

Energy-efficient lighting

All staircases in the administration building in Neukirchen-Vluyn were converted to LED lighting only. The research and development department is also switching to LED lighting gradually. A gradual transition to LED lighting is also taking place in more and more areas of the factory, contributing to even more efficient and sustainable lighting.

We plan to take this energy-saving measure in hall 1 and hall 2 of our Anholt production facility in 2024/2025. In addition, we have been discussing an optimised lighting concept for the car park, allowing for the car park lights to be switched on and off as needed.

In total these modernisation measures are making a big difference with regard to the amount of energy needed at our sites and therefore also to reducing our CO₂ emissions.

Roof refurbishment

Roof refurbishments are another way to save energy. Planning provides for around 10,000 m² of roof space to be refurbished at our production facility in Neukirchen-Vluyn between 2024 and 2026. The roof will be insulated to a modern standard

and prepared to allow for installation of another photovoltaic system. In addition, contamination in the form of asbestos is to be removed, which will take place very carefully and in consideration of all required safety measures. Lights will be converted to LED here, too.

More efficient furnaces

Another project planned in 2023 is to replace the surface treatment furnaces at the Neukirchen-Vluyn factory. The new modern furnaces will allow for an increase in efficiency of 35%. These can be powered with electricity, but can also be converted to be powered with natural gas. This energy-saving investment is scheduled for late 2024/early 2025.

E-Mobility

We gradually replace our vehicle fleet with electric vehicles. We have ten charging poles for electric cars in Neukirchen-Vluyn and eight in Anholt. We are planning to install charging poles for electric cars at all German sites. In addition, we are going to add photovoltaic carports to the charging infrastructure in our employee car park in Neukirchen-Vluyn. These are scheduled for completion in 2025. Furthermore, we have had charging lockers for electric bicycles installed, which will be available to our employees from early 2024 for charging their personal electric bicycles as well as the TROX job bike that employees can lease through the company.

Green energy

Our goal is to replace fossil energy sources such as gas and oil with renewable energy that we purchase or produce ourselves. We are already covering 100% of the GmbH's electricity needs with green electricity.



Sustainability measures at our international sites

Our subsidiaries are also continually investing in measures to reduce the TROX GROUP's carbon dioxide emissions.

TROX Switzerland

The TROX HESCO production facility that is currently being built in Switzerland is an exemplary project of consistently planned sustainability. Construction work on this new building began on 23 March 2023. Just like the TROX Auranor factory in Norway, this facility is also designed to allow for virtually climate-neutral operation. The new-build will have a total size of 10,385 m², featuring production space, offices, a cafeteria and a showroom under the same roof.

TROX INVESTS IN CLIMATE-NEUTRAL FACTORIES AROUND THE WORLD



Even construction itself is exemplary when it comes to sustainability. The new TROX HESCO factory's wooden construction allows for a reduction of CO₂ emissions and has many impressive advantages:

- The wooden construction is CO₂-neutral and resource-friendly.
- Wood can be used very flexibly and provides for a pleasant, natural indoor climate.
- The wood elements of the structure store around 1,850 t CO₂.
- The regionally sourced amount of 2,500 m³ of wood regrows in Swiss forests in two hours.
- The wood was sourced regionally to reduce transport routes.
- The prefabricated wooden elements can be assembled on site quickly, producing very little noise and dirt.
- Separable joints promote a circular economy.
- The wooden construction method fulfils all relevant energy-related requirements.

The use of regenerative wood as the primary raw material highlights TROX' close connection with nature and is an example of effective resource conservation.



In order to achieve our goal to create a virtually climate-neutral factory, we will take further steps related to sustainability:

- This will be the first opportunity for our innovative system solution TROX O_x to demonstrate its strengths: fewer interfaces, quicker planning, realisation and acceptance, and more efficient operation (see p. 58).
- A photovoltaic system with an annual output of around 650,000 kWh will cover more than 50% of the electricity demand.
- Efficient heat pumps that are powered by the photovoltaic system will provide heat and hot water and therefore replace a traditional gas or oil-powered heating system.
- Smart office lighting that turns off when no people are present will help to save energy.
- Electric mobility will be expanded.
- Production which is currently spread across a number of buildings is pooled compactly in a single 6,980 m² big production hall. This allows us to optimise logistics processes and reduce internal transport.
- The new large production hall enables us to perform powder coating on site, eliminating related transport entirely.
- There will also be enough room to produce ventilation grilles not only for the domestic market but for the entire TROX GROUP.

In the construction and relocation phase we are going to ensure that production is moved seamlessly from the currently used buildings to the new factory. Upon completion, TROX HESCO will offer a pleasant working environment for 120 employees, thanks to the natural indoor climate provided by the wooden structure.

The new TROX HESCO factory in Switzerland represent the highest standards when it comes to building and operating innovative, climate-neutral production facilities. This makes the new-build emblematic of sustainable construction in the entire building sector and of a future-ready TROX GROUP.

TROX Spain

Digital conversion of the machinery layout allows for a simplification of configuration of technical complex products such as the X-CUBE X1 based on specific customer requirements. This improvement of process automation allows for a reduction of material and energy consumption for TROX Spain.

TROX UK

Refurbishment of our British subsidiary's roof was completed in 2023, and the photovoltaic system was installed. Commissioning is scheduled for 2024, expecting that enough electricity can be produced to enable TROX UK to permanently operate independent of external energy supplies.

TROX Czech Republic

The highest safety standards were ensured during demolition of a building with asbestos contamination on a piece of land purchased by TROX TECH-TRADE in the Czech Republic, in order to protect the workers' health and to prevent any contamination that could harm people or the environment.

The measures we took for health protection and to prevent contamination:

- Hermetic sealing of the building with adequate full cover and sealing on the inside and the outside, as well as division into control zones in order to separate contaminated and non-contaminated work areas
- Comprehensive protective clothing for workers including HEPA filter masks
- Direct connection of the controlled zone with 3-chamber decontamination sluice system – changing rooms, air showers, contaminated changing rooms
- Spraying of areas with wetting and stabilisation agents before, during and after dismantling of materials containing asbestos
- Removal of crumbling parts using a vacuum cleaner with H14 filtration
- Vacuum cleaning of the entire control zone area after the end of the works
- The 18.56 tonnes of material containing asbestos that were removed were treated with a wetting agent and sealed in suitable PE bags. The bags were vacuumed, treated with a wetting agent, labelled, transported to the designated disposal point and taken to a landfill site where they were immediately covered with inert material.

55% of demolition costs were accounted for by removal and disposal of the asbestos. We are convinced that it was worth it.

TROX Norway

A photovoltaic system featuring roof and facade panels was installed here in 2023. It will be taken into operation in 2024, thus further expanding the sustainability status of the already virtually climate-neutral production facility.



WE DON'T STOP EXPLORING!

Our paulownia plantation – outstanding CO₂-binding properties and a promising raw material

The paulownia plantation in Neukirchen-Vluyn, our research project in cooperation with Stefan Bonsels’ farming business and bio innovation park Rheinland e.V., developed far better than expected in its second year of growth. A trunk diameter of 8 cm was indicated in the growth estimate, however, the trunks already reached a diameter of 12 cm and a height of 5.5 metres in 2023.

We were also really interested in the amount of carbon dioxide that was bound as a result. In the forecast it had been estimated that 7 tonnes of CO₂ would be stored per hectare in 2023, but the actual amount turned out to be 18 t/ha.



Paulownia – rapidly-growing hybrid tree compared to oak after 10–12 years



The Federal Republic of Germany assumes that 5 tonnes of CO₂ are stored in one hectare of agricultural land. To avoid double counting here, we subtract this value. The remaining amount is therefore over 13 t/ha of CO₂ stored in our paulownia plantation. It was calculated that 66.55 tonnes of carbon dioxide were bound in the 5 hectares big plantation in 2023. The additional CO₂ storage of the tree crowns, the leaves and the actual CO₂ accumulation in the soil were not taken into account here.

Development of this sturdy and lightweight raw material that grows extremely quickly and has strong CO₂-binding properties encourages us to pursue the development of a European certification standard at the local level, and to explore industrial application opportunities for TROX products in building construction and other fields.

We already received our first optional certificate for this. Our first application test was promising: the raw material was used in installation kits for fire dampers and fire testing was successful, despite the contradictions one might expect.

Our paulownia plantation creates opportunities:

- For locally based certification models according to European standards
- For new ways to produce and use sustainable raw materials
- For joint action
- For a future in which sustainability is realised in meaningful and transparent ways

 Find out more about the paulownia project and its goals, progress and opportunities here.
<https://paulownia.trox.de/en>

Good ideas for waste reduction

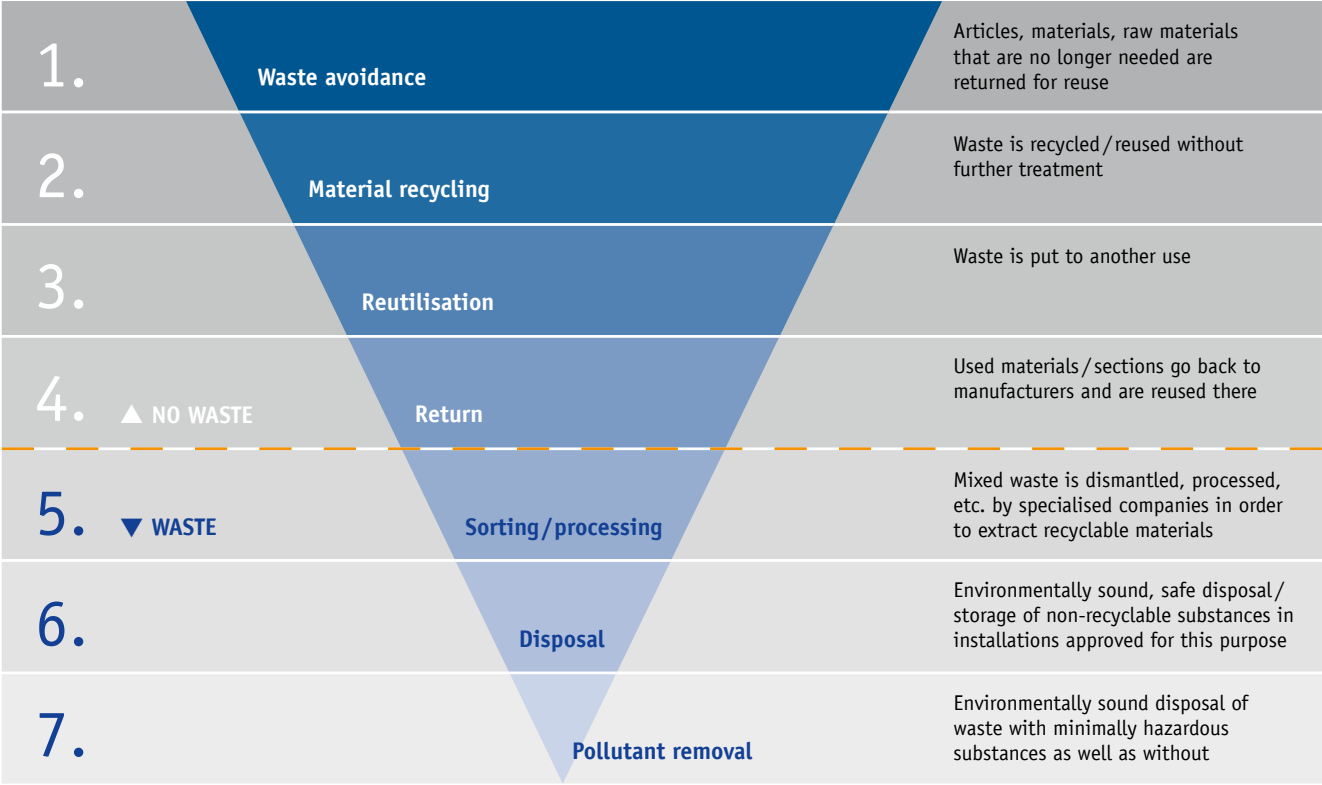
We will introduce a uniform waste management system for the entire group by 2025, to prevent a wasteful use of resources. In this context we will be gradually adjusting and refining the calculation conditions, which means that the way in which waste quantities are specified is also undergoing a change process. In addition, we are happy to use any good ideas for CO₂ reduction, such as the roll packer at the Anholt site. It compresses wood waste so effectively that the filling capacity of a container in tonnes is increased by a factor of 2.3. The result: fewer containers and fewer trips are needed, and less CO₂ emissions are produced.



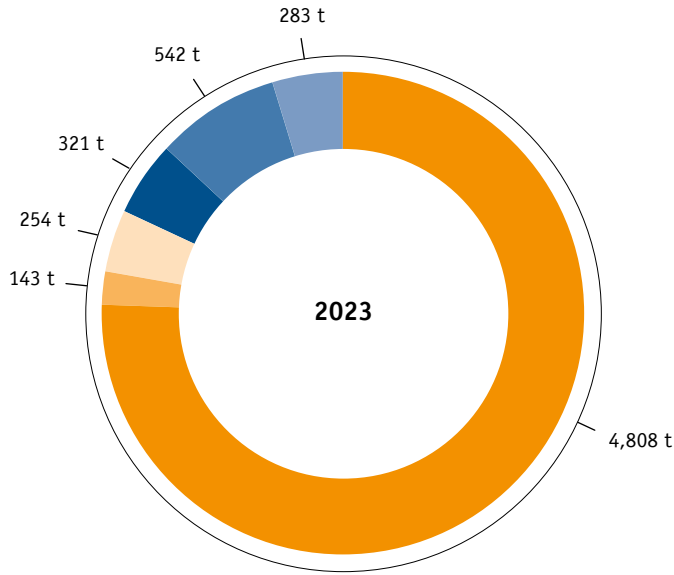
It remains our priority to avoid waste directly, and we deliberately promote this through sustainability-aware product design and by reducing waste in production processes. We also strive to increase the recyclability and reusability of our products through their design. Where it is not possible to return products to the economic cycle, we are cooperating with certified waste management companies, in order to separate waste and make it reusable or to dispose of remaining waste in an environmentally friendly way, such as in the case of the asbestos from the building demolition by TROX TECH-TRADE (see p. 91).

We are currently updating our hazardous substances management to allow for simpler and more efficient administration and greater transparency when it comes to handling hazardous substances. We are going to transfer the hazardous goods register to the database in this context. This also includes reviewing all safety data sheets and operating instructions and additions for the individual hazardous goods: where is the hazardous substance used, and how much of it, CAS registry number, waste code, etc. By providing access to up to date information at all times in this way, we are ensuring safety and compliance.

The TROX waste hierarchy



Waste produced by TROX GmbH



TROX GmbH	2020 in t	2021 in t	2022 in t	2023 in t
1 Waste avoidance	not recorded	not recorded	not recorded	not recorded
2 Material recycling	3,385	5,190	5,576	4,808
3 Reutilisation	1,292	367	210	143
4 Return	223	237	243	254
Recycling rate 2–4	83%	86%	87%	82%
5 Sorting/processing	327	357	272	321
6 Disposal	660	552	569	542
7 Pollutant removal	37	43	59	283
Disposal rate 5 – 7	17%	14%	13%	18%

It is our responsibility to preserve our world’s resources. Our waste management approach that is mandatory for the entire TROX GROUP sets the course for the future in this regard.

WASTE AVOIDANCE
IS OUR PRIORITY



We are counting on a successful future – with innovative digital solutions.
Application and control simplification, e-learning, knowledge preservation: with our digital solutions we seek to set the course for low-energy and resource-friendly further development in the ventilation and air-conditioning industry.

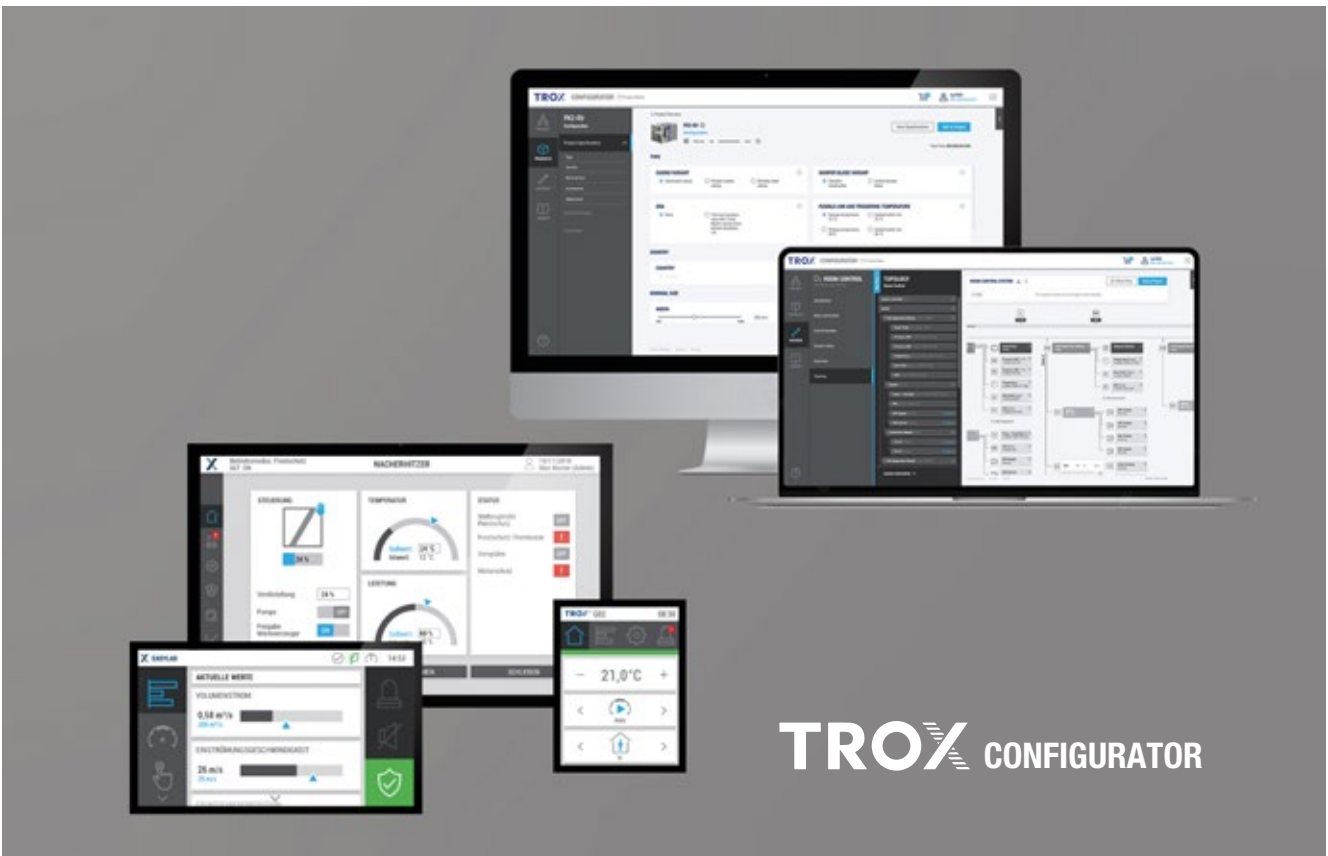
We do so through comprehensive, ongoing long-term research and investment in innovative projects.

Manufacturing Execution System (MES)
Implementation of the Manufacturing Execution System (MES) amounts to a quantum leap when it comes to the ability to respond in the event of downtime, material bottlenecks or similar surprises. The MES allows for the involved production islands to be synchronised with each other far more effectively (see p. 70–71).

TROX O_x system solution
The system solution TROX O_x that was presented at ISH 2023 allows for integration and control of the complexities of building automation and control systems in a single digital system for the first time (see p. 58).

TROX CONFIGURATOR
The advance version of the TROX CONFIGURATOR, a purely web-based solution with new features that allow for greater efficiency in overall planning and system design, was also presented at ISH 2023 for the first time.

FleetScope IP
Furthermore, a monitoring tool is scheduled for commissioning in 2024, which will precisely and centrally determine the emissions of our vehicle fleet and allow for far more efficient data processing, among other things. This web-based fleet software includes all processes of fleet management in a single system.



WE TRACK AND REALISE OUR SUSTAINABILITY POTENTIAL WORLDWIDE

Learning Management System (LMS)
The LMS is an interactive solution that is linked to the micro learning approach. The system enables all TROX divisions to efficiently share knowledge.

Infor LN 10.7
The new version of this application provides for all logistics processes (purchasing, production, warehousing, dispatch) for all European subsidiaries of TROX to take place under one roof. It generates simplified mapping of relocations, clearer information flows and better interlocking between the subsidiaries.

TROX HESCO has been working with LN 10.7 since 2022, KS Filter has been using the system since the new production hall was taken into operation in June 2023, and TROX X-FANS will soon start using it, too. We plan to make this solution the international standard, and therefore a global cornerstone of homogenous reporting.

Digital services
Our goal is to provide a holistic systematic approach for cloud-based solutions. As part of a federally funded research project we have developed a cloud environment for X-CUBE air handling units and installed these devices in buildings. This enabled us to store useful data from real-life applications in the cloud and to research methods that will create added value for our customers, such as automated function monitoring, fault detection and energy monitoring. In addition to traditional methods, we also tested machine learning and AI approaches.

Our consistent pursuit of the TROX system approach and progress made with myTROX and TROX O_x have also changed the general conditions for successful cloud-based business models. To be able to offer optimised solutions here, we are going to carefully review the existing cloud environment under the new overall conditions.

It is through these and many other digitisation projects that we are seizing present-day opportunities, aiming to create more sustainable solutions for technical processes and application-specific simplifications.



Public relations and social matters



Michel Maaß
Head of Talent Recruitment and Development
Deputy Head of Personnel/Legal Department

‘Every company would like to have dedicated and highly effective employees who are open-minded and supportive of one another. We have this type of employees. It goes without saying that we deliberately encourage this. After all, we want to be able to impress and make a difference with a strong team, also in the future. This is true within the TROX GROUP, in direct contact with customers and of our involvement in committees, associations and organisations. We believe that to maintain and strengthen the positive attitude of our employees is the best investment we can make into TROX’ future viability.’

PUBLIC RELATIONS SOCIAL MATTERS

Public relations and social matters

Through our corporate culture of mutual appreciation and involvement in committees and associations, we place our focus on human beings, their well-being and health in everything that we do.

The people who work here are the most precious resource of the TROX GROUP. They are the driver of sustainably successful corporate development that leads to a secure, viable future. In line with our motto 'The human being is the yardstick, and people's well-being is our goal', we feel that it is our duty to offer our staff the best working conditions possible.

This includes a corporate culture that is based on kindness, mutual understanding and general interest in one another. To promote this culture of mutual appreciation is our investment in a sustainably strong and solid TROX GROUP with healthy and motivated employees.

Our goal to provide fresh, healthy indoor air and our achievements with regard to climate protection to date underscore the link between sustainability and health also externally. We are actively involved in committees and associations and communicate with policy makers and the public to promote awareness of matters of sustainability and new building automation standards.

OUR CORPORATE CULTURE IS BASED ON MUTUAL APPRECIATION

together we are
TROX





Our work is based on our shared values.
Back in 2021, the TROX GROUP defined five values that provide guidance for our day-to-day work, define our spirit of community and represent our strength: trust, safety, reliability, quality and sustainability.

These values that are further reinforced in group-wide workshops shape the TROX community in which mutual appreciation is a top priority. In line with our motto ‘together we are TROX’, we arrange many joint activities to breathe life into our TROX GROUP community. These range from teambuilding measures via acknowledgement of achievements of staff members through to parties, strategy meetings and baking contests for charity. Here are a few examples from 2023:

- TROX Germany**
- Participation in the TARGOBANK Run in Duisburg with 78 TROX employees and in the Lollslauf running event during Lullusfest in Bad Hersfeld with 25 employees of TROX X-FANS
 - Basketball tournaments in Bad Hersfeld
 - Christmas parties in Anholt and Neukirchen-Vluyn
 - Creation of the TROX Christmas film with its tranquil atmosphere and idyllic mountain cabin charm. The Board of Management of TROX would especially like to thank the TROX community for its dedication and great performance. The film was translated into a number of languages, and was used to show the events of the past year at the Christmas and year-end parties held across the entire TROX GROUP.

- TROX Netherlands**
- Two-day trip to Cologne with colleagues and partners to celebrate having been ranked first place in the TROX company ranking

- TROX UK**
- Staff member of the quarter awards and honoring of staff members who have been with TROX for 25 years
 - TROX UK fantasy football league
 - Team leader and BITS training sessions
 - ‘TROX bake-off 2023’ baking contest for charity and step count challenge for charity
 - Christmas jumper day
 - Fish and chips Christmas dinner

- TROX France**
- Seminar event and birthday party in line with the motto ‘together we are TROX’
 - Participation in the 10k ‘Course Enfants sans Cancer’ Odyssea running event along the Quais de Bordeaux

- TROX Polen**
- Kayak trip
 - Archery tournament
 - Barbecue and karaoke event
 - Christmas party with 1930s casino theme

- TROX Turkey**
- Culinary community event
 - Welcome party
 - Workshop with the writer Yalın Alpaz

**CONNECTED THROUGH
OUR TROX VALUES**

- TROX China**
- Teambuilding measures
 - Badminton tournament
 - Quarterly birthday parties

- TROX Malaysia**
- Participation in the Trick or Treat Charity Run

- TROX Brazil**
- TROX Brazil Run and Walk with 140 staff members
 - Recognition of achievements of women at TROX on social media
 - Recognition of achievements of TROX employees that work behind the scenes to ensure high quality standards in production and delivery of TROX products and services on social media
 - TROX Brazil football team that competes in external championships
 - Visualisation of values and appreciation with posters showing employees at work that were presented in the company and at the Febrava trade fair

- TROX Argentina**
- Strategy meeting with 150 participants seeking to implement the TROX values: influential individuals, employees and managers
 - Innovation promotion and recognition events

- TROX Mexico**
- Joint event in honour of Day of the Dead, acknowledging the strict cultural customs at TROX
 - Easter party
 - Little events for important occasions of employees, such as weddings
 - Recognition of achievements of women at TROX, e.g. mother’s day party and participation in economic forums for women
 - Recognition of special achievements of employees
 - Break-even party
 - Strategy meeting with 80 participants seeking to implement the TROX values: influential individuals, employees and managers
 - Year-end party

These joint activities and experiences give rise to a community that thinks and acts as one. A community that is motivated, willing to use its full creativity and has often contributed to boosting innovation at TROX.



This QR code will take you to the 2023 TROX Christmas film





Community, health, family.
We strive to create accommodating working conditions.
As a responsible employer we offer individual development opportunities, promote health and safety and take care of our employees.

This is why we introduced job bikes in 2023. This opportunity for employees to lease a bicycle with financial support from us encourages staff members to choose a bike over a car, as well as encouraging sustainable and health-friendly behaviour of our employees. The success of our job bike promotion shows that this ‘combination of sustainable and healthy’ really works. 343 leasing contracts were concluded by our staff in 2023: 219 in Anholt, 3 in Goch and 121 in Neukirchen-Vluyn.



Since summer 2023, employees at our Neukirchen-Vluyn site have been able to participate in our weekly ‘active breaks’ to stay fit.

In addition to this, we coordinate employee requests with regard to working hours with operational requirements as best we can and offer flexi-time and mobile working where possible. These options help to flexibly combine work and family commitments.

We also laid the foundations for signing the Compatibility of Work and Care Duties charter of the NRW state government in 2023. This will lead to us receiving state certification in 2024, allowing us to offer our staff members professional support in this area.

Our employees’ mental health is another issue that we deeply care about. This is why we prepared a pilot project for introducing an Employee Assistance Programme (EAP) in Anholt in 2023. The programme is designed to raise awareness among executives, enabling them to identify psychological stress in their team, and there is also a hotline for staff members to call in a crisis.

We strive to offer working conditions to our employees that are compatible with their personal circumstances and that will keep them healthy and happy in their job. This approach is highlighted by the measures we took in 2023. The result: TROX staff identify with the company and pass on this positive attitude.

This shows, for example, in their active participation in our ‘employees recruit employees’ campaign. Since it was launched in 2022, we have been able to fill 26 permanent posts.

Another part of this is the outstanding dedication with which our employees turn initial good ideas for improvements into true innovations. Our TROX innovation award is presented annually to honour this pioneering spirit.

We are proud to be able to say that we were among the top 5% of companies rated on the employer portal kununu, also in 2023.



Sustainable upskilling? Let’s do it together!
Everybody at TROX has the opportunity to develop and enhance their skills and competences through education and training.

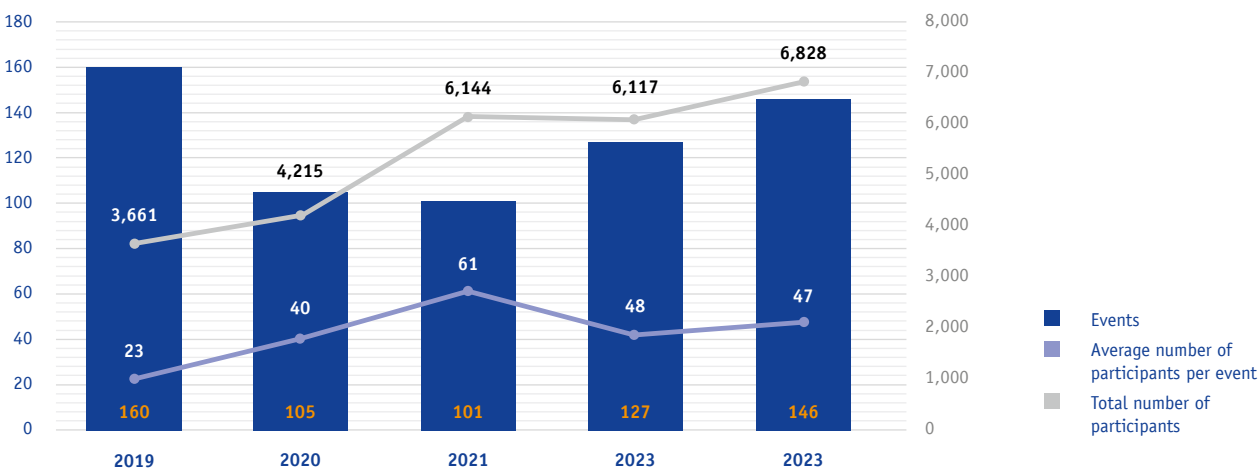
The TROX ACADEMY offered a total of 19 additional seminars in 2023. The number of participants increased by 12%.

In addition to this there are our popular free webinars in which employees can learn curated TROX knowhow on issues relevant to the industry and are able to ask direct questions. The training sessions are available as videos in the TROX ACADEMY media library.

This allows us to preserve and promote key qualifications, in order to reinforce our leading market position.

**WE STEADILY ADD TO
WHAT WE HAVE TO
OFFER AS AN EMPLOYER**

Number of participants in TROX ACADEMY events in total and on average per event



TROX wins over the experts of the future.

With its apprenticeships and opportunities for university students, TROX GmbH offers young talent a high-grade entry into the working life. We are committed to demonstrating early on that we are a partner that has plenty to offer and appreciates and encourages a strong performance.

This is why we attach great importance to a strong training concept. Our high-quality apprenticeships prepare young people for their future working life. They gain knowledge and confidence and can benefit from great career opportunities in our company after completing their training. We continuously expand our training capacities, and have started to train apprentices in two new professions in 2023: warehouse logistics specialist and warehouse clerk. In addition, we laid the foundations for offering a combined study programme in the area of IT. TROX GmbH had 58 apprentices in 2023. We actively embrace gender equality at TROX and are always happy to show this to potential future female staff at our annual Girl’s Day event.

We also cooperate closely with schools, universities, education providers and other institutions, and use a wide range of options to present TROX as an innovative and technically highly interesting employer at an early stage. We offer scholarships, organise symposia, offer students a platform for exchanging ideas and steadily expand our range of available positions for working students and interns. In 2023 we stepped up our participation in recruiting trade fairs, presenting the TROX portfolio and showcasing exciting job and development opportunities. We also introduced the option to apply via WhatsApp using PitchYou in 2023, as well as holding open applicants’ afternoons in Anholt.

We can offer young talent a wide range of exciting career opportunities. 14 apprentices and 7 student workers chose to start their career at TROX in 2023.

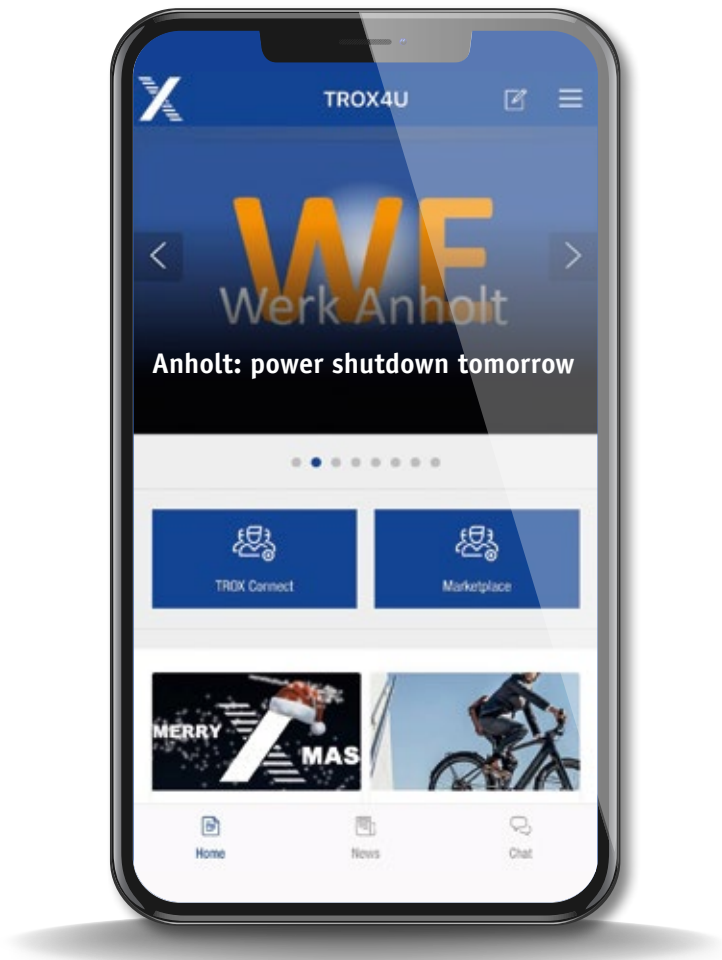


Our employee app TROX4U helps the community to stay in touch.

The TROX employee app was activated for the Neukirchen-Vluyn and Anholt sites in 2023. Offering a wide range of information and many interactive features, it proved a great success.

The information and interaction functions of the TROX staff app in 2023:

- Chats
- News channel
- Push messages
- Role authorisation concepts
- User management
- Quick links
- Works council information
- Writing posts
- Liking and commenting on other people’s posts
- Viewing the meal plan
- Marketplace for organising carpooling, looking for apartments, etc.
- Joining communities (TROX Connect) that arrange private meet-ups such as barbecues, football games, walks, etc.
- Retrieving documents e.g. on personnel or legal issues



COMMUNITY IS OUR TOP PRIORITY AT TROX

In early 2024, the TROX staff app was also released for TROX HGI, TROX X-FANS and the Goch site. We are also working on further functions including real-time translation into the respective native language, shift plans, time sheets, forums for things such as cooking and football, a social media wall, a channel for students, a retiree flyer for former staff members, an interface to the TROX4U intranet, betting games, city cycling and contest ideas.

The TROX staff app does and will make many things possible. It is already being used enthusiastically, thus serving a key criterion of our ‘together we are TROX’ values campaign: it connects people.

Honest, informative and interactive use of social media

The TROX GROUP increased and improved its social media presence considerably in 2023, thus establishing a key component of our strategy to promote sustainable business practices. Using a leading social media management platform, we were able to consistently strengthen the quality of these activities across our European channels.

Our dedication in this area reflects the increasing role of social media in corporate communication at TROX. The steadily rising number of followers meanwhile shows that our messages are received and that our stakeholders are interested in them. This is a development that does not only reflect that the TROX brand is becoming more and more well-known but also the trust placed in our skills by the general public.

Our central editorial office makes sure that the company values and messages we publish are authentic and consistent across all channels. This enables us to maintain an online presence that correctly reflects our corporate culture and ethics. In addition, we permanently monitor all channels to ensure that our values are put into practice also online and enable us to respond to any violations quickly and determinedly.

Active involvement of different TROX departments and teams helps us to enrich our online presence with a wide range of perspectives and areas of expertise. This integrational approach does not only allow us to present our corporate activities in a dynamic and multi-faceted way, it also boosts our employees’ feeling of belonging and community.

Great dedication, central control, consistent monitoring and involvement of all divisions enables us to ensure that our values and the TROX brand are communicated authentically on social media.

WE PRACTISE AND PROTECT OUR VALUES



At TROX, appreciation also means willingness to help out.

Practising our values helps us to take a more sensitive view of other people’s personal circumstances.

In 2023 we donated 71 laptops for second-life use through the ‘Das macht Schule’ initiative that supports projects at schools. These are passed on to schools that need more hardware. This enables us to support digitisation processes at schools while reducing waste.

We also support a school near our factory in South Africa to help ensure good education opportunities in the place that is home to about 70% of the TROX staff.

Following severe flooding, we helped our colleagues of TROX Spain to resume production as quickly as possible and to make up for any downtime by moving production to Anholt. Heavy rainfall had caused a nearby canal to flow over, and the TROX site was flooded up to a height of 1.7 metres. This led to severe damage on premises, machinery and the warehouse stock of finished products and raw materials.



That production could resume so quickly was possible to a great part thanks to the willingness of our employees at TROX Spain and TROX Anholt to work hard and do overtime and weekend shifts, allowing us to introduce a third shift at the Anholt site and cancel the planned shutdown period at TROX Spain. Many helping hands helped us to deliver our orders on time, despite the disaster.

We are serious about compliance.

Our internal TROX Business Conduct Guideline, our official human rights declaration of commitment, the anti-discrimination pledge of the TROX management and the TROX whistleblower system illustrate our attitude and approach with regard to sensitive issues.

By observing compliance principles, we are fostering a TROX GROUP that respects the relevant laws and that actively opposes practices such as corruption and exploitation. We are committed to fair and proper dealing with our customers, suppliers and other business partners in accordance with laws and ethical principles. Our message is this: we reject any business that would involve a violation of laws or our regulations.

We are setting a clear sign with our regulations. By introducing the Compliance Management System (CMS), we ensure that these principles are observed in the TROX GROUP’s national and international business activities. In order to generally avoid compliance violations, we identify and assess risks. In addition, the TROX Trust Channel whistleblower system provides for the option to report any compliance issues or violations of rules openly or anonymously. It can be used, for example, by staff members who feel unable to speak to their supervisor, the compliance department or directly to the Board of Management. Customers, suppliers and other business partners are also able to use the system to draw our attention to economic crime or any activities that might harm our company.

With the TROX Trust Channel we seek to encourage each individual to keep their eyes peeled and point out any irregularities to make sure that the TROX values are respected in Germany and abroad.



Making a difference in the industry through passion and a pioneering spirit

The issues of sustainability and health are linked closely to ventilation and air-conditioning technology that ensures fresh, clean air in indoor spaces. This is why it is a matter that is close to our hearts to communicate this aspect of building technology openly and honestly and to establish it in future-oriented standards. In order to promote this, we are actively involved in politics and research in our industry and in society.

ISH 2023

At ISH 2023 we presented some innovative product and system developments that are taking sustainable development in the building sector to a new level, such as the low-impulse air supply system WAX-LI and the TROX O_x system platform with the online planning tool TROX CONFIGURATOR. A day of lectures and interesting discussions around the topic ‘Healthy indoor climate quality – more than infection protection. How much fresh air do people need to live and work?’ was held in the Indoor Air Forum of the trade fair. This information event was organised by the Heinz Trox Foundation, the professional association Gebäude-Klima e. V., the VDMA and the VDKF.

We took this exchange with the visitors to our trade fair booth and in the Indoor Air Forum as an opportunity to communicate and discuss our most important present-day sustainability issues.

A little highlight during the trade fair was when the visitors got to hear the official trade fair song: our TROX song ‘Feel it in the air’. The pop version of the song that we composed and wrote and produced with singers from TROX was received so well, it is now available on all popular music portals. It is fair to say that it is well-worth listening to.



The podcast ‘From zero to technology’ was also launched at ISH 2023. The entertaining episodes about technology and TROX take listeners behind the scenes, showing how different products and solutions work. With several thousand regular listeners, the TROX podcast reaches people across Germany, Austria and Switzerland. In addition to the usual streaming platforms, the latest episodes are also available via the TROX4U app.



Go to the TROX song



Listen to the latest podcast episode (in German)



WE BELIEVE IN CONSTRUCTIVE EXCHANGE

Aachen Air Quality Day

The ‘Day of air quality’ in Aachen that was initiated by the Heinz Trox Foundation was all about a highly informative exchange of knowledge in the area of healthy air. Under the motto ‘Future-ready schools instead of education (building) crisis’, speakers from the areas of academia, application and from professional associations presented their findings from the past three years as well as courses of action for schools as future-ready spaces.

It became clear here once more how the issue of health is linked to high-quality indoor air, and how simple it can be to realise high indoor air quality with highly efficient ventilation technology.

We are making an impact through our involvement in committees and associations.

We are involved in the relevant committees and associations of our industry to promote a steady improvement of standards for good indoor air and energy efficiency in the building sector. Together with these organisations we seek to work towards a reduction of strain due to emissions from new-builds and establishing sustainable refurbishment solutions for existing buildings.

Sustainability standards in the building sector have been changed for the better a number of times in the past, thanks to this commitment. We will continue to dig deeper, ask uncomfortable questions and actively work on the right answers, also in the future, since sustainable buildings with CO₂ emission-reducing building technology are our future.

We believe in value-based communication.

We think of our status as a globally leading manufacturer of high-quality ventilation and air-conditioning technology as a responsibility. We are happy to lead by example. This includes an approach to communication that reflects the values practised at TROX. Our communication is open, honest, informative and responsible. It is not a one-way street but encourages interaction and exchange.

We seek to engage in this exchange that is beneficial for everyone involved with our customers, business partners, staff members and friends by means of video interviews, an email newsletter, social media, ACADEMY events, our staff app and at trade fairs and symposia.

We use our intranet and the staff app to stay in direct contact with our employees. We reach out to our customers in personal conversations and through our website, for example with informative videos and podcasts. We communicate with shareholders and funding providers at shareholder and supervisory board meetings, in personal and virtual meetings and through regular written reporting.

We deliberately produce not only an online but also a print version of our TROX life magazine, in order to give our readers a break from the fast-paced digital world. We want them to lean back, take some deep breaths and flick through the magazine. In TROX life we share knowledge on topics such as ‘Fire and Smoke’ or ‘Climate and Health’ in a highly informative and entertaining way. All of these topics are relevant to our stakeholders, regardless of their age, affinity towards digital media, their function or their position. We focus on a profound, scientific exploration of current issues that are presented in a highly informative manner and are fun to read about.



Successful sustainability management

Our structures encourage productive collaboration

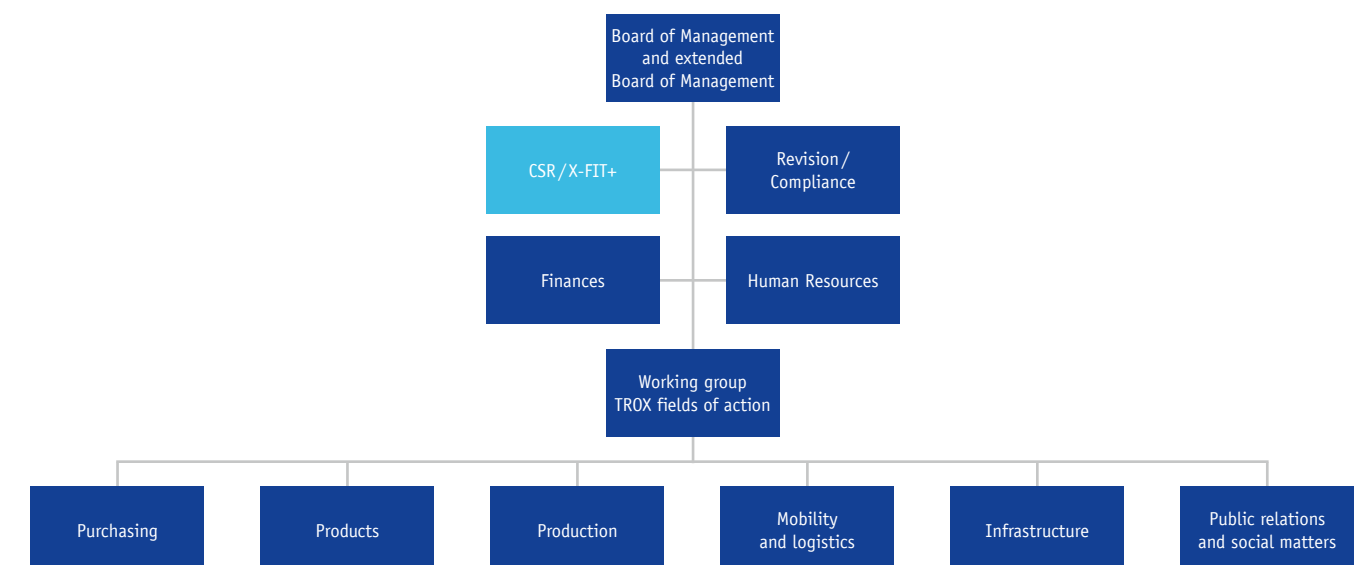
Together rather than individually. This is our definition of constructive sustainability management. And this is how we tackle the climate-related challenges of today and tomorrow.

Goals that are pursued by everyone require a management that makes sure everyone is involved. This is why we have established a sustainability management system at TROX that provides for clear guidelines, responsibilities and processes and a central point that links our collective action: good communication.

We have a modern organisational structure in which all divisions that are relevant to sustainability development are in constant exchange that goes beyond questions of hierarchy. This open-minded culture and approach promotes the motivation and dedication of all staff members when it comes to implementing efficient sustainability measures in TROX' six relevant fields of action. Sustainability is team work, after all.

WE CREATE CLEAR STRUCTURES

The TROX CSR organisational structure



Our dialogue structure allows for a successful journey towards sustainability.

The success of our sustainability development is based, among other aspects, on a dialogue structure in which not only our own divisions but also societal, political and environmental developments, as well as the wishes and requirements of our stakeholders are taken into account. This ongoing dialogue gives rise to a journey towards sustainability that everyone is willing and able to embark on together.

At TROX this journey starts with the Board of Management and the extended management who are responsible for identification and achievement of the company’s sustainability goal. They define the direction of any sustainability efforts and lead by example.

The CSR (Corporate Social Responsibility) department is in charge of regulating all processes that are necessary for achieving the defined climate target. It ensures that measurable indicators are registered and refined, and exchanges information with everyone involved. It also helps to broaden the perspective of sustainability within the TROX GROUP through direct contact with other companies and associations.

All the information gathered in this way is used by the TROX fields of action working group to ensure precise performance indicators and effectively implement sustainability measures for the different fields of action.

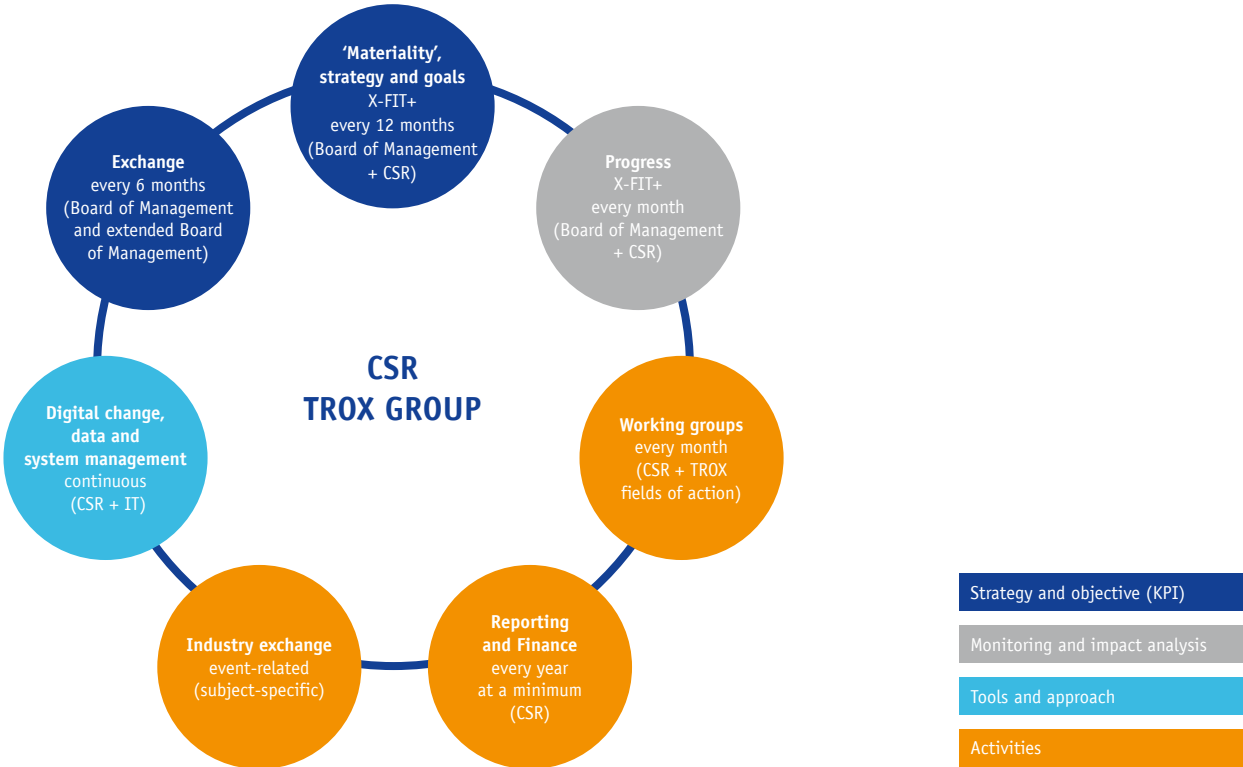
The TROX dialogue structure therefore ensures a flow of information across all levels that aids decision making for our corporate group and our stakeholders and promotes their social, environmental and financial development.

Reliability thanks to regular exchange

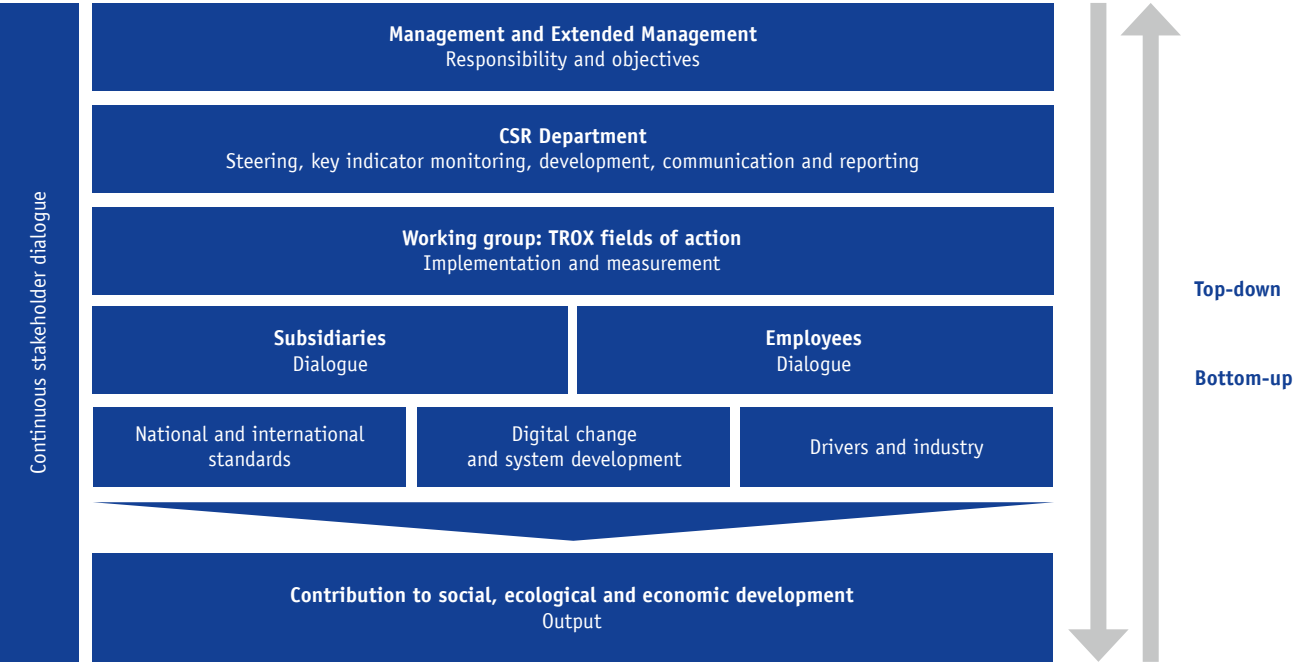
Information and knowledge is exchanged at regular intervals at TROX. This binding schedule helps to ensure a smooth flow of information and aids interaction processes among everyone involved.

STRUCTURED EXCHANGE OF INFORMATION IS KEY

The TROX CSR information and interaction cycle



The TROX CSR dialogue structure



Our improvement system: TROXellence.

A strong improvement system called TROXellence is part of our organisational structure. This firmly integrated system enables our employees to systematically get involved in optimising matters of humanity, productivity and cooperation at TROX. There are two standardised methods that help to identify and utilise potential here: the TROX Production System (TPS, see p. 68–69) and the TROX Administration System (TAS). All measures and projects initiated via these systems are listed and monitored with regard to their status, progress, etc. in our TROX X-FIT+ programmes.

The systematic approach of TROXellence ensures that potential for improvements is identified and recorded and utilised with sound guidance and control. In addition, ongoing exchange between our specialist divisions allows for transparent processes and joint commitment.

About this report



Format and cycle

The TROX Sustainability Report 2023 is published in print and online. Its contents are available as a complete document in PDF format for download at www.trox.de. The Sustainability Report is published in a completely revised form on an annual basis.

Corporate Sustainability Reporting Directive

Based on the CSRD, more than 15,000 German companies are required to provide transparent information about their sustainability efforts based on a uniform EU reporting standard. To this end, the European Union has developed the European Sustainability Reporting Standards (ESRS). Despite the fact that the TROX GROUP will not be required to prepare such reports until 2025, we are already undergoing some internal adaptation processes to allow us to comprehensively report in line with ESRS 2 and about all ESRS topics related to the environment, social matters and governance which have been classified as relevant.

Global Reporting Initiative

In order to meet the diverse interests and concerns of our stakeholders in a holistic and transparent manner, we are guided by the internationally recognised standards of the Global Reporting Initiative (GRI). The GRI Index refers to the respective content in the sustainability report and also provides a link to the SDGs. TROX reports transparently on topics and content that are relevant from the perspective of the company and stakeholders.

Sustainability initiatives

TROX is committed to the 17 Goals for Sustainable Development of the United Nations and outlines how it will help to achieve these goals in the report.

In 2022, the TROX GROUP committed to the ten principles of the United Nations Global Compact (UNGC). As a signatory company, we are now obliged to report on our progress in an annual 'Communication on Progress' (CoP).

Assessment of sustainability achievements

We are currently not subject to an audit, but voluntarily undergo an annual external audit by EcoVadis. In 2023 we were able to improve from 50 to 62 points and were awarded bronze status once again.

Report content

The focus topics of the Sustainability Report 2023 include the effects that climate change has on human beings and nature and the contributions that the TROX GROUP is making to climate protection and human health as a provider of clean air which is essential to human well-being and as a company committed to sustainability.

In 2023, the strategic direction with respect to the SDGs was underpinned by the preparation of a double materiality analysis. Sustainability management has linked this materiality analysis with the TROX sustainability strategy, the goals and measures. The relevant topics of the double materiality analysis are addressed in the six strategic fields of action: 'Purchasing', 'Products', 'Production', 'Mobility and logistics', 'Infrastructure', and 'Public relations and social matters'. The six fields are subject to the activities and effects of the TROX value chain.

The reporting period covers the entire 2023 financial year of the TROX GROUP (1 January to 31 December 2023). The editorial deadline for this report was 24 May 2024.

Target groups of the publication are customers, suppliers and business partners, employees, scientific institutions, media representatives and other interested stakeholders.

Contact

Your opinion is important to us. You can email us with questions or suggestions: christine.rosskothen@troxgroup.com

The TROX GROUP

TROX GROUP at a glance – key figures

TROX GROUP sales
in million €

724
2023 **670**
2022

Production sites
globally

20
2023 **20**
2022

CO₂ emissions (Scope 1 and 2)
in the TROX GROUP
in t per million €
invoiced

14.3
2023 **19.7**
2022

OUR VISION: GROWING TOGETHER

At TROX we rely on shared and continuous growth to secure a prosperous future of TROX GROUP as one of the world's biggest suppliers of ventilation and air-conditioning components and systems.

OUR MISSION: GOOD AIR PROMOTES QUALITY OF LIFE

Striving to provide 'indoor life quality' for human beings, TROX provides fresh indoor air, focussing on well-being, safety and efficiency.

Operating subsidiaries
of the TROX GROUP

32 in **27** countries
2023

34 in **29** countries
2022

CO₂ emissions
(Scope 1 and 2)
in the TROX GROUP
in t

10,351
2023

13,204
2022

Social performance indicators at the TROX GROUP

Employees at the end of the year
Number

4,932
2023 **4,710**
2022

Permanent members of staff
Number

4,602
2023 **4,305**
2022

Positions filled by women
Number

1,048
2023 **988**
2022

Part-time employees
Number

383
2023 **405**
2022

Women in senior positions
Number

74
2023 **70**
2022

20
23

20
23

GRI standards

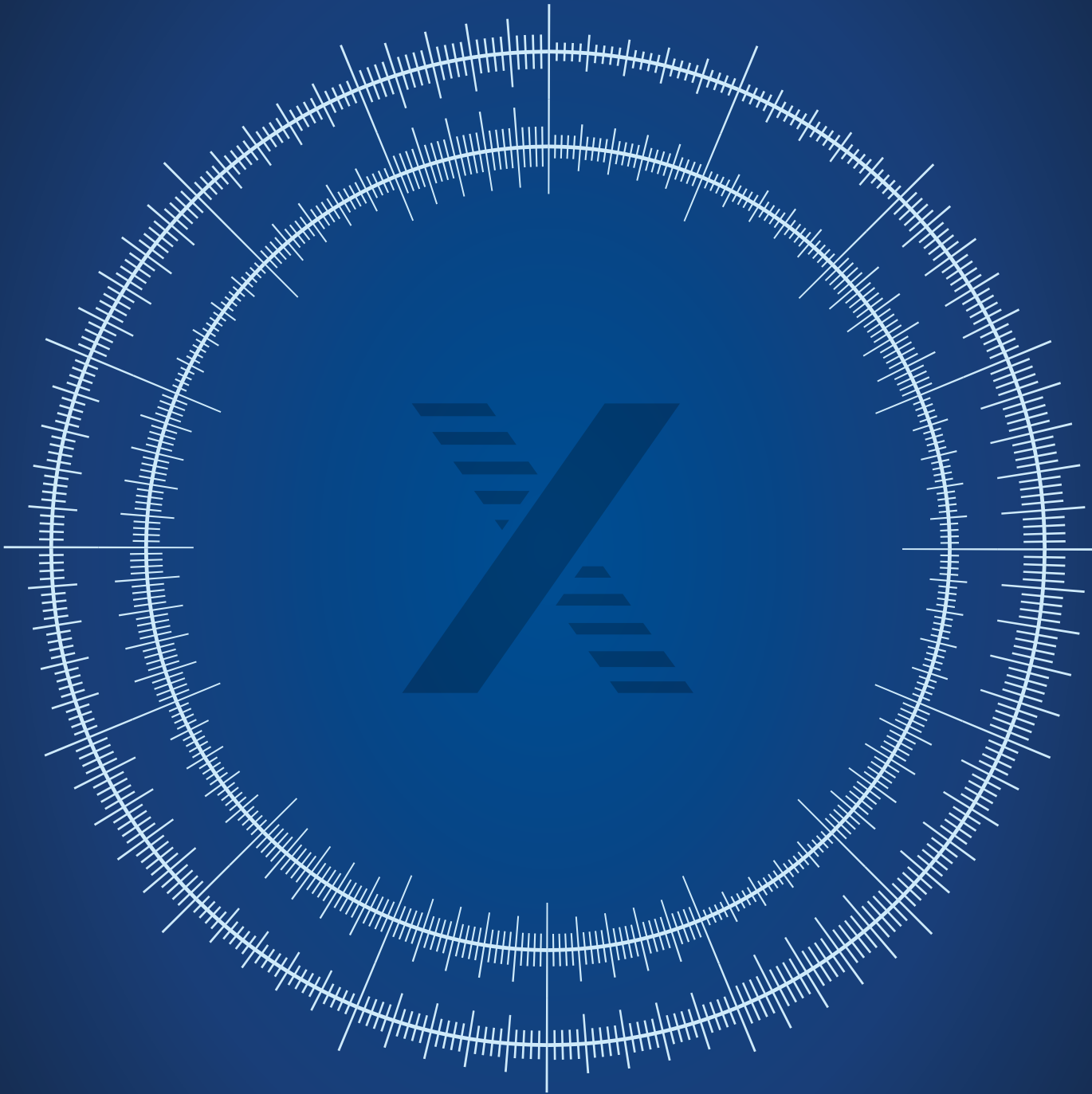
INDICATOR	GRI STANDARD	DESIGNATION	REFERENCE SUSTAINABILITY REPORT 2023	PAGE	SDG	UNGC
100s – GENERAL INFORMATION						
Organisational profile	102-1	Name of the organisation	Contact data	129		
Organisational profile	102-2	Activities, brands, products and services	The TROX GROUP in 2023	4, 5	2, 3	
Organisational profile	102-3	Headquarters of the organisation	Contact data	129		
Organisational profile	102-4	Business premises	The TROX GROUP in 2023	4, 5		
Organisational profile	102-5	Ownership and legal form	The TROX GROUP in 2023	4, 5		
Organisational profile	102-6	Markets served	The TROX GROUP in 2023	4, 5		
Organisational profile	102-7	Size of the organisation	The TROX GROUP in 2023	4, 5		
Organisational profile	102-8	Information about employees and other staff	Non-financial report	118, 119	8	
Organisational profile	102-9	Supply chain	Purchasing	44–53	8	
Organisational profile	102-10	Significant changes in the organisation and its supply chain	Publication of the Annual Report 2023 in the Federal Gazette			
Organisational profile	102-11	Precautionary principle or precautionary measures	Management The TROX sustainability strategy The TROX fields of action	112–115 26–29 38–43		
Organisational profile	102-12	External initiatives	Stakeholders Public relations and social matters	30, 31 98–111	17	
Organisational profile	102-13	Membership in associations and interest groups	Public relations and social matters	98–111	17	
Strategy	102-14	Statement from senior decision maker	Perspectives	8, 9		
Ethics and integrity	102-16	Values, guidelines, standards and norms of conduct	Our attitude	12–17	8, 13	
Company management	102-18	Leadership culture	Management	112–115		
Involvement of stakeholders	102-40	List of stakeholder groups	Stakeholders	30, 31	17	
Involvement of stakeholders	102-41	Collective agreements	–			
Involvement of stakeholders	102-42	Identification and selection of stakeholders	Stakeholders	30, 31		
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Reporting procedure	102-45	Entities mentioned in the consolidated financial statements	Publication of the Annual Report 2023 in the Federal Gazette			
Reporting procedure	102-46	Defining report content and topic boundaries	Our attitude Goals The TROX sustainability strategy The TROX fields of action	12–17 22–25 26–29 38–43		
Reporting procedure	102-47	List of essential topics	Materiality	32, 33		
Reporting procedure	102-48	Reformulation of information				
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Reporting procedure	102-55	GRI content index	GRI standards	120–123		
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Management approach	103-2	The management approach and its components	Management, The TROX fields of action	112–115 38–43		
Management approach	103-3	Assessment of the management approach	Management	112–115		

* This report is not reviewed externally. However, the sustainability activities of the TROX GROUP are evaluated annually by EcoVadis.

INDICATOR	GRI STANDARD	DESIGNATION	REFERENCE SUSTAINABILITY REPORT 2023	PAGE	SDG	UNGC
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Supplier social rating	414		Purchasing	44–53	3, 8	Principle 1, 2
Socio-economic compliance	419		Public relations and social matters	98–111	8	Principle 1, 2



Glossary

A

AIR POLLUTANTS

Emissions to the air that can have a harmful effect on the environment such as NO_x or CO. The origin of an air pollutant can be natural or caused by human beings.

ANTHROPOCENE

The name of the era in which human beings became one of the most important influencing factors of biological, geological and atmospheric processes on earth (the past about 30,000 years, accounting for about three seconds of the history of the earth).

B

BIODIVERSITY

This term refers to three areas: diversity of ecosystems, diversity of species, and genetic diversity within species.

BUND

Association for the Environment and Nature Conservation Germany e. V. (Bund für Umwelt und Naturschutz Deutschland e. V.).

C

CARBON CAPTURE AND STORAGE TECHNOLOGIES

Extracting CO₂ from the atmosphere and storing it underground.

CARBON DIOXIDE (CO₂)

A chemical compound of carbon and oxygen. Greenhouse gas, non-toxic, colourless and odourless gas. Arises primarily during the combustion of carbonaceous energy sources.

CARBON MONOXIDE (CO)

Toxic, flammable and odourless gas. Arises in incomplete combustion of carbonaceous energy sources.

CFCs

Chlorofluorocarbons that were used as propellants, refrigerants or solvents. These led to disaster for the ozone layer and were banned in 1989. The ozone layer has since regenerated.

CIRCULAR ECONOMY

A regenerative system in which resource consumption, waste production, emissions and energy waste are minimised by slowing down, reducing or closing energy and material cycles.

CLIMATE ADJUSTMENT

Measures for dealing with global warming.

CLIMATE FARMERS INITIATIVE

Promotion of regenerative agriculture across Europe that retains more CO₂ in the soil and support for interested farmers to convert their farms accordingly using data-assisted processes.

CLIMATE NEUTRALITY

The creation of a product or a service does not give rise to an increase of harmful gases in the atmosphere.

D

DIESEL EMISSIONS

Emissions resulting from the combustion of diesel fuels, e.g. NO_x, HC, SO₂, CO and NMHC. Fine dust is also considered a diesel emission.

DIESEL SOOT

See diesel emissions.

DIN EN ISO 14001

European environmental management standard.

DIN EN ISO 9001

European quality management standard.

DIVERSITY

Conscious and appreciative attitude towards the diverse individuals that form a society.

DOUBLE MATERIALITY ANALYSIS

This defines the relevant sustainability issues of a company from two perspectives, as outlined in the ESRS as part of the CSRD. This is on the one hand about the impact of business activities on human beings and the environment (inside-out perspective) and on the other hand about external risks and opportunities for business success (outside-in perspective).

CO₂

Toxic, odourless, flammable gas. 37 billion tonnes of CO₂ are released to the atmosphere every year. The largest emitters are: China (30.7%), USA (13.6%), India (7.6%) and Russia (4.5%). There is now more CO₂ in the air than over the past 3 million years. An example of CO₂ avoidance: the driver of a diesel passenger car cycles to work instead of driving (about 8,000 km/year). In this way the person avoids the generation of approx. 1,200 kg CO₂.

CO₂ CERTIFICATES

Allow companies to emit a certain amount of CO₂. Only a part is issued free of charge by the EU. Those who consume more must buy additional CO₂ certificates, while those who operate in a climate-friendly way can sell them.

CO₂ EQUIVALENTS

Unit of mass used to standardise, compare and summarise different greenhouse gases.

CORPORATE SOCIAL RESPONSIBILITY

Social responsibility assumed by companies that goes beyond legal requirements.

CORPORATE SUSTAINABILITY REPORTING DIRECTIVE (CSRD)

An EU directive that entered into effect on 5 January 2023 and requires companies in the EU to disclose the environmental and social impact of their business activities and to report about the ways in which their measures taken in the areas of environment, social matters and corporate governance impact their business.

E

EARTH HOUR	Electricity is turned off in buildings for 1 hour.
EARTH OVERSHOOT DAY	The day on which all natural resources have been used that the earth can regenerate within one year.
ECOLOGICAL FOOTPRINT	Sustainability indicator to measure demand on the ecosystem and the natural resources of the earth.
ECOTAX	Tax on environmentally harmful substances and energy sources, in Germany taxation of mineral oil and electricity.
EMISSION	Substance or radiation, emanating from a source, e.g. CO ₂ emissions or noise.
EMISSIONS TRADING	Trading with certificates permitting emissions.
ENERGY	Ability to perform work (in the physical sense), specified in joule or watts.
ENVIRONMENTAL PERFORMANCE INDEX (EPI)	Assesses the environmental performance of 180 countries.
ENVIRONMENTAL PRODUCT DECLARATION (EPD)	Documents a product’s environmental impact across its entire lifecycle.
ESG REPORTING	Reporting obligation recommended by the sustainable finance board that must be met by all companies with more than 250 staff members from 2022. It is based on the three pillars of sustainability: environment, social matters and good governance.

EUROPEAN CLIMATE LAW	Adopted by the EU Commission in April 2021. The goals of the law are to stipulate climate neutrality by 2050, to legally cement the new 2030 climate target (reduction of greenhouse gas emissions by 55 rather than 40%), to provide for adjustment measures and progress monitoring and to ensure public involvement.
EUROPEAN SUSTAINABILITY REPORTING STANDARDS (ESRS)	Substantiate the details of sustainability reporting which companies in the European Union must submit according to the CSRD for the areas of the environment, social matters and governance.

F

FAIRTRADE LABEL	Label used to identify goods that stem fully or in part from ‘fair trading’ that is defined based on set criteria.
FINAL ENERGY CONSUMPTION	Energy, calculated from consumer demand (e.g. diesel from petrol pump, electricity from current collector).
FONA STRATEGY	With the FONA strategy (Research for Sustainability), the Federal Ministry of Education and Research is concretising its research funding for climate protection and greater sustainability, based on the 17 SDGs of the United Nations.
FRIDAYS FOR FUTURE	Global social initiative by students, striving to implement comprehensive climate protection measures as quickly as possible.
FSC LOGO	The logo of the Forest Stewardship Council stands for sustainable forestry and identifies products that have been created using wood from sustainable forestry.

G

GEOENGINEERING	The endeavour to fix what has been destroyed on earth in the past through various measures.
GERMAN SUSTAINABILTIY CODE (GSC)	Supports the development of sustainability reporting with 20 GSC criteria, which are checked for formal completeness including qualified feedback.
GOVERNANCE	The way in which an organisation, company or institution is managed and controlled.
GREENHOUSE EFFECT	Effect that greenhouse gases in an atmosphere have on the surface temperature of planets. As long-wave radiation cannot pass through CO ₂ , heat produced is reflected to the earth, causing the greenhouse effect. Greenhouse gases are produced, for example, through intensive livestock farming. The planet is home to around 944 million cattle that release methane to the environment. One cow produces the same amount of greenhouse gas as a passenger car travelling a distance of around 18,000 km per year.
GREENHOUSE GAS PROTOCOL (GHG PROTOCOL OR GHGP)	Internationally recognised tool for assessment and calculation of greenhouse gas emissions.

GRI STANDARD	Internationally recognised guidelines for the preparation of sustainability reports, developed by the Global Reporting Initiative.
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H

HALF-LIFE PERIOD	The period in which half of the atoms of a substance decay.
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I

INTERGOVERNMENTAL PANEL ON CLIMATE CHANCE (IPCC)	This world climate council was founded in 1988 by the World Meteorological Organisation and the United Nations Environment Programme. The results of the work are the basis for international climate negotiations within the framework of the UN Framework Convention on Climate Change.
ISO 14001	International environmental management standard.
ISO 26000	Guidelines regarding the social responsibility of organisations.

K

KYOTO PROTOCOL	International treaty for the reduction of greenhouse gases. Named after the place of signature: Kyoto, Japan (1997). German goal: to achieve a reduction of CO ₂ emissions by 21%, down to the 1990 level by 2012.
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L

LCC (LIFE CYCLE COST)	Life cycle costs: costs of a product from the product idea to its withdrawal from the market.
LIGNITE (BROWN COAL)	Energy sources with poor carbon dioxide balance: three times as much CO ₂ is released as by a gas-fired power plant with the same output. Extraction in large-scale open cast mines goes hand in hand with massive interventions in nature. Supplies 35% of electricity generated worldwide.

LINEAR ECONOMY	Also referred to as throw-away economy. A major share of raw materials goes to landfill or is burned after the respective period of use.
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LOCAL TRANSPORT	Journeys of less than 50 km or with a travel time of under 1 hour.
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M

MEAT CONSUMPTION

The Food and Agriculture Organization of the United Nations (FAO) predicted that around 370.7 million tonnes of meat would be produced globally in 2024. This corresponds to an increase in the amount of meat produced by over 100 million tonnes compared to 2000. The average amount of meat consumed per head in 2024 is estimated as 28.2 kg, with 55.8 kg in industrial countries and 22.2 kg in developing countries.

METHANE (CH₄)

Greenhouse gas, colour and odourless hydrocarbon, main component of natural gas.

MINERAL OIL TAX

Excise duty on mineral oils and natural gas.

N

NITROGEN OXIDES (NO_x)

Collective term for gaseous oxides of nitrogen.

NUCLEAR POWER STATION

435 reactors were in operation in January 2024: 93 in the USA, 56 in France, 55 in China, 33 in Japan, 37 in Russia, and 161 in other countries around the world.

O

OECD

Organisation for Economic Co-operation and Development.

OFFSETTING, CLIMATE COMPENSATION

Describes the compensation of CO₂ emissions by financing climate protection projects such as tree planting.

OZONE LAYER

Atmospheric layer that shields the earth from UV radiation.

P

PARIS CLIMATE AGREEMENT

195 countries committed to mitigating climate change and transforming the global economy in a climate-friendly way at the UN Climate Change Conference on 12 December 2015. The goal is to limit the global temperature increase compared to the pre-industrial era to 1.5°C, but in any case to below 2°C.

PARTICLES

Small pieces, e.g. dust; see also diesel emissions.

PARTICULATE MATTER (FINE DUST)

Smallest particles, e.g. PM10 with a maximum diameter of 10 µm or PM2.5 with a maximum diameter of 2.5 µm.

PRIMARY ENERGY

Energy contained directly in energy sources (e.g. fuel value of coal). Primary energy carriers include coal, lignite, mineral oil, natural gas, water, wind, nuclear fuels and solar radiation.

PROCESS

A set of activities that interact within a system.

PRODUCT LIFE CYCLE

The life span of a product from development, via use, through to (a possible) recovery.

R

RECYCLED PAPER

Paper made from waste paper.

RECYCLING

Material recovery.

REGENERATIVE CAPACITY

Ability to regain environmental balance after external interferences.

REGENERATIVE ENERGIES

See renewable energies.

RENEWABLE ENERGIES

Energy sources that are renewable and in principle unlimited, such as wind or sunlight.

RESOURCE

Natural supply of utilities needed, for example, for commercial production.

RESOURCE EFFICIENCY

The relationship between the usefulness and the required use of resources.

S

SCOPE 1, 2, 3

Scopes for greenhouse gas emissions that arise directly from activities of companies and indirectly in the value-creation chain. Scope 1 covers direct carbon dioxide emissions of a company, Scope 2 refers to indirect CO₂ emissions of energy suppliers, and Scope 3 includes CO₂ emissions in the upstream and downstream supply chain.

SOOT PARTICLES

Main component of fine dust. Formed during the combustion of organic substances such as wood or diesel.

STAKEHOLDERS

Internal and external groups of people that are directly or indirectly affected by all business activities, either now or in the future (e.g. shareholders, suppliers, customers).

STANDARD

A relatively uniform, widely recognised and considered course of action is referred to as a standard. A standard is often the result of a standardisation procedure. It is not decisive, whether a standard is based on a procedure specified by a public or other formal body, or on general recognition.

SULPHUR DIOXIDE (SO₂)

Colourless, pungent-smelling, water-soluble gas that is harmful to people and the environment.

SUPPLY CHAIN

Overall multi-level process of upstream and downstream connections between companies, from a customer's order through to delivery of and payment for the product or service.

SUSTAINABILITY

Guiding principle of reconciling ecological, social and economic goals to allow for future-oriented development in line with intergenerational justice.

SUSTAINABILITY COUNCIL

The federal government's advisory council for sustainable development.

SUSTAINABILITY STRATEGY

Practical orientation to facilitate sustainable action by policy-makers and society, aiming to achieve ecologically, economically and socially balanced development.

SUSTAINABLE AVIATION FUELS (SAFs)

Aviation fuels made from biogenic residues such as edible oil that are added to fossil kerosene.

SUSTAINABLE DEVELOPMENT GOALS (SDGs)

17 Sustainable Development Goals adopted by the United Nations in 2015.

SUSTAINABLE FINANCE ADVISORY BOARD

Launched by the German government in June 2019 with the aim of developing concrete, actionable recommendations for shaping the necessary sustainable transformation process in the real and financial economy.

SUSTAINABLE SOCIETY INDEX (SSI)

This index of the Technical University of Cologne evaluates data from the World Economic Forum in Switzerland as well as the World Bank and the International Monetary Fund in the USA, among others, and thus puts 213 countries and regions under the microscope in terms of sustainability.

U

UN CLIMATE CHANGE CONFERENCE

The annual meeting of the countries that signed the UN Framework Convention on Climate Change in 1992.

UNITED NATIONS GLOBAL COMPACT

Global initiative for responsible corporate management.

UTILISATION

Actual share of all available capacities that is being used.

V

VALUE CHAIN

Also referred to as value-creation chain. Depiction of production as a sequence of value-adding activities during which resources are used.

W

WASTE

Waste within the meaning of the German Law on Closed Cycle Management and Waste (Kreislaufwirtschaftsgesetz = KrWG) is any substance or object which its owner discards, intends to discard or is required to discard. The KrWG distinguishes between waste for recovery and waste for disposal. Waste for recovery is waste that is recovered; waste that is not recovered is waste or disposal.

WWF

World Wide Fund for Nature, a nature conservation organisation.

Z

ZERO WASTE

A philosophy dedicated to sustainability, striving to ideally produce no waste and to avoid a wasteful use of resources.

TROX

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Germany

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The Trox logo is located in the top right corner. It consists of the word "TROX" in a bold, white, sans-serif font. The letter "X" is stylized with three horizontal lines passing through it. The background of the entire page is a close-up photograph of green leaves with serrated edges, creating a bokeh effect in the background. There are also some semi-transparent geometric shapes, like triangles and rectangles, overlaid on the image.

TROX

20

23