

Sustainability

2021



Sustainability at TROX

The TROX GROUP in 2021

THE INCREASING IMPORTANCE OF GOOD, HEALTHY AIR INDOORS, ESPECIALLY DURING THE PANDEMIC, STRENGTHENED US AS THE GLOBAL MARKET LEADER FOR INNOVATIVE VENTILATION AND AIR-CONDITIONING TECHNOLOGY IN 2021 – AND LED THE TROX GROUP FURTHER ALONG ITS PATH TOWARDS A SUSTAINABLE FUTURE.

SUS TAIN ABILITY

WORLDWIDE

34

SUBSIDIARIES



4,571

STAFF MEMBERS OF VARIOUS NATIONALITIES



35.4

€ MILLION
INVESTMENT VOLUME



MARKET LEADER IN EUROPE
SINCE THE 1970s, TODAY

the **global**
market leader

OFFERS FRESH AIR
TO APPROX.



320

MILLION* PEOPLE

*Calculation see p. 19

REVENUES
IN MILLION €



2018	498
2019	533
2020	516
2021	600

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Sustainability Report 2021

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Perspectives of sustainability at TROX



Udo Jung
Managing Director of TROX GmbH

'Our aim is to provide healthy indoor air in a climate- and resource-neutral manner. This makes TROX a highly meaningful company, as it is sustainable in two respects. Good air is essential for life and health – sustainability is the most complex issue of our time because it not only affects all areas of the company, but goes far beyond that.'



Thomas Mosbacher
Managing Director of TROX GmbH

'Our great commitment to sustainability stands for stable growth of the TROX GROUP. We believe that the responsibility we bear is an opportunity to use our position as a driver for change, to unite economic concerns with social and ecological ones, to strengthen our group of companies on the competitive stage and to effectively counter climate change.'



Christine Roßkothen
Head of Corporate Social Responsibility (CSR) TROX GmbH
Board member of the Heinz Trox Foundation

'Even though investments in social compatibility do not pay off as quickly as investments in energy efficiency measures, both issues are prioritised equally at TROX. We support the 17 Sustainable Development Goals (SDGs) adopted by the UN because we believe that all aspects of sustainability are ultimately about people. About people and about our future.'



Prof. Dr. Hans Fleisch
Chairman of the Foundation Council
of the Heinz Trox Foundation

'The issue of a sustainable future is something that affects us all. However, for a foundation-owned group of companies like TROX, it is almost of existential importance to translate current social values and ecological demands into sustainable action. After all, sustainability forms part of the essence of any foundation.'

What motivates us

MOTIVATION

Global warming, CO₂ emissions, climate protection, responsibility – all over the world people are discussing these issues, making predictions and accusations. But what is actually happening?

GREATER CLIMATE PROTECTION MEANS FRESHER AIR

The fact is that changes in our world are becoming more and more dramatic. Despite the best of intentions and globally agreed goals, according to the Intergovernmental Panel on Climate Change, up to 3.6 billion people are living in an environment that is particularly vulnerable to climate change. In 2020, 30.7 million people lost their homes as a result of natural disasters. The Arctic region has shrunk from 7.6 million km² in 1980 to 4.7 million km² in 2020. By 2100, global sea levels are predicted to rise by one metre, thus destroying the living area of 200 million people.

These are figures that affect us all, but they have not yet reached us on a personal level. However, let's look at the example of our cars. Assuming an annual mileage figure of 10,000 km, this corresponds to 1–2 tonnes of CO₂ emissions – which means that we alone are responsible for the loss of 3–6 m² of sea ice in the Arctic.

We all know that we have to do something. However, any consensus that is reached at political level, such as the agreement reached at the UN climate summit in Glasgow to define stricter climate targets and thus limit global warming to 1.5 degrees, never seems to be taken seriously and is not implemented.

We are aware of our responsibility to future generations. This is why TROX is among the companies that, as active pioneers in their industry, are consistently and energetically tackling the issue of sustainability. And this is being done at association level for the entire building sector as well as within the company.

Sustainability is the most complex topic of our time, because it not only affects all areas of a company, but also goes far beyond this – from the sourcing of raw materials to energy-efficient operation to the recycling of products. We are only just learning about what this means for us as a company, not to mention what it means for us as people – as people capable of taking action and as members of the human race that is wholly exposed to the changing climate. With all its consequences for our health. Our health is largely determined by our own actions, but also by external conditions. The latter – and we have learned this during the pandemic – includes the air which we are inevitably exposed to on a daily basis. We are playing our part here. Our sustainability goal is to ensure that people have access to good air when indoors.

We have always regarded air as an essential element of life that can only keep us healthy if it is fresh and free of contaminants. By 2025, we will be capable of offering approx. 350 million* people around the world fresh indoor air using highly efficient TROX technology. Because fresh, healthy air not only stands for high-quality ventilation and air conditioning – it makes every breath a gift for our health and our environment.

We have committed to the goal of the TROX GROUP being fully climate-neutral by 2040. Our aim is to provide healthy indoor air in a climate- and resource-neutral manner.

*Calculation see p. 19

VIEWPOINT

70

Ahead of their time

70 YEARS OF SUSTAINABLE PROCESSES

The ability of our company to recognise and implement possibilities, opportunities and necessities has characterised its development from a supplier of just ventilation grilles to the world market leader in ventilation and air-conditioning technology with sustainable life cycle solutions. Since its foundation in 1951, TROX has repeatedly proven itself to be a pioneer of innovative, efficient technology, while consistently establishing high standards and playing a leading role in shaping the industry.

Saving energy was a priority of TROX from the very outset, and this can be seen in its early efforts to combine cost-effectiveness with resource conservation.

TROX

YEARS

70 years of TROX

From ventilation grilles to sustainable life cycle solutions



Components

1951 – 1979 | After commencement of production with ventilation grilles, completion of the entire range of components for air distribution

Devices / units

1980 – 1989 | Expansion of the product range for ventilation and air-conditioning technology with powerful, more complex devices

Subsystems

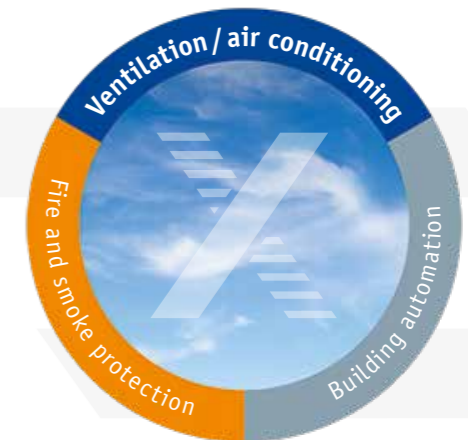
1990 – 2009 | Control and monitoring of all subsystems of a ventilation and air-conditioning system

The TROX system

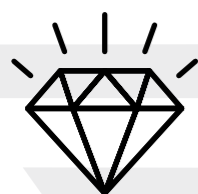
2010 – 2019 | Digital service: from design and procurement to monitoring, control and maintenance

Solutions

since 2020 | Holistic, sustainable solutions across the entire life cycle of a building



Highlights 2021



5+3

With five values for the entire TROX GROUP and three further values developed individually by each company, we define what TROX stands for and where its strengths lie – and not just on the TROX Values Day, the 13th of September 2021.

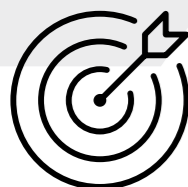
- ▶ TROX sustainability strategy (p. 28–33)
- ▶ Field of action 'Social matters' (p. 102–103)



TROX Trailer

True to the motto 'If the customers can't come to us, we'll come to them', 2021 saw the TROX Trailer also go on tour in the Netherlands. At the Installatie Vakbeurs exhibition in Hardenberg alone, almost 7,000 visitors learned all about efficient TROX technology.

- ▶ Field of action 'Public relations' (p. 116–117)



Solutions!

Construction projects completed on time, with no interface problems and including building technology and automation – TROX complete solutions save time, money and nerves.

- ▶ Field of action 'Products' (p. 66–67)



Auranor

The new plant of our Norwegian subsidiary Auranor, which is almost fully climate-neutral thanks to innovative sustainable technology, was officially inaugurated on 22 September 2021.

- ▶ Field of action 'Infrastructure' (p. 92–93)



Digitisation

Thanks to the precise three-dimensional representation of rooms using the TROX 3D scanner, it is now much easier to tailor ventilation solutions to individual rooms and to design them in a cost-optimised manner.

- ▶ Field of action 'Infrastructure' (p. 98–99)



120,000 €

This amount was donated by TROX employees, TROX GmbH and the Heinz Trox Foundation following a spontaneous joint campaign for the victims of the flood disaster in the Ahr Valley.

- ▶ TROX Foundation (p. 44–45)



Expert forum

Held for the first time on 29 September 2021 and initiated by the Heinz Trox Foundation, the Aachen Air Quality Day serves as a new expert forum and an exchange platform for science, practice and politics.

- ▶ Field of action 'Public relations' (p. 116–117)

'AIR IS OUR MOST IMPORTANT ELEMENT OF LIFE.'



Udo Jung
Managing Director of TROX GmbH

AIR

Fresh, healthy air for everyone

The air we breathe influences three aspects of life that are essential to us: our well-being – our performance – our health. As the world's leading ventilation and air-conditioning expert, TROX believes that it has a responsibility to ensure fresh, healthy air – inside and consequently also outside of buildings.

Good air is essential.

Humans can survive three weeks without food, three days without water, but only three minutes without air. An adult breathes in 500–700 ml of air 10–15 times per minute. With an average of 13 x 600 ml, that is around 11,200 l of air per day. 11,200 l that flow into our lungs every day, supply us with oxygen and decide how we are doing.

According to the World Health Organisation (WHO), 7 million people worldwide die prematurely every year due to air pollution. Respiratory diseases are increasing – and therefore so is the number of people who are particularly at risk.

For TROX, clean, contaminant-free air is far more than a requirement for climate protection. We believe that air is an essential element of life and keeping it clean has a direct impact on how well and how long people live. And ever since the coronavirus pandemic, we have all experienced first-hand how important it is for our lives and our survival.

WE BREATHE
 ≈ 11,200 L AIR/DAY
 = 62 BATHTUBS OF 180 L EACH



**WITHOUT VENTILATION,
30 STUDENTS IN A CLASSROOM
WILL HAVE GENERATED
APPROX. 5,000 PPM OF CO₂
AFTER 45 MINUTES –
5 TIMES THE RECOMMENDED
MAXIMUM AMOUNT**



Good indoor air – what does this actually mean?

Ventilation and air-conditioning technology has always been the core competence of TROX. We have carried out intensive scientific research into what constitutes an ideal, healthy indoor climate and we have incorporated the findings into our technologies.

For example, every breath taken by an individual increases the room's CO₂ concentration, which is measured in ppm. 600–800 ppm correspond to a high indoor air quality, while comfort levels are reached at 1,000 ppm (according to Pettenkofer). Values above this level lead to tiredness, an increased risk of infection and health problems. TROX mechanical ventilation and air-conditioning systems are designed to keep the CO₂ concentration low, which ensures an optimum indoor climate in each individual room.

The indoor climate is influenced by many factors: temperature, humidity, air movement, air quality and the air change rate.

People feel most comfortable:

- At temperatures of between 22 and 25 °C
- At a minimum humidity of 40%
- With an air movement in the room of 0.2–0.5 m/s
- With good air quality, i.e. air that is free of evaporating contaminants, fine dust, viruses, germs and bacteria as well as high CO₂ concentrations
- At a CO₂ concentration below 1,000 ppm
- With a constant supply of fresh air

Well-being, performance, health through good air

Numerous investigations and studies confirm the positive effects of good, healthy air in rooms. People feel better, work more attentively and with greater concentration, they are also fitter and they fall ill less frequently.

- Better test scores in maths and reading
- 14% faster solving of arithmetic problems at double the outdoor air flow rate
- Fewer asthma symptoms
- 12% fewer sick days per hour of increased air change rate
- Significantly lower risk of infection

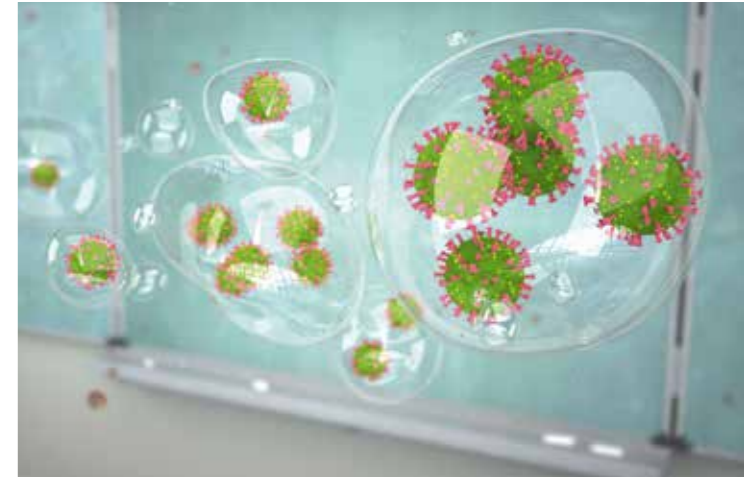
EVERY BREATH IS A DECLARATION OF LOVE TO THE BODY

The risk of infection increases with the CO₂ concentration.

Rooms that have a high CO₂ concentration also have an especially high number of aerosols and germs in the air. Tests have revealed that just one person suffering from acute flu symptoms in a room with 30 people for four hours and at a CO₂ concentration of 1,000 ppm will infect five other people in the room. At a level of 2,000 ppm, the person will infect twelve and at a level 3,000 ppm, a single person could infect as many as 15 people. Low ppm values, like those achieved with a continuous energy-efficient supply of fresh air by our mechanical ventilation systems, also keep the risk of infection low.

Healthy air for healthy people.

We are all connected with one another through the medium of air. The coronavirus pandemic has demonstrated this with frightening consequences. However, it has also set in motion a process that would provide clarification and seek solutions. TROX, with its wealth of experience and knowledge gained from 70 years in the ventilation and air-conditioning industry, has played an active role in this process to find and promote solutions.



TROX OFFERS FRESH AIR TO APPROX. 320 MILLION* PEOPLE

The reality is that most people spend more than 90% of their time indoors. This is why we offer highly efficient ventilation and air-conditioning solutions that are capable of reliably removing CO₂, contaminants, viruses and other germs from indoor air. In addition, they optimise moisture, heat and acoustics. And to ensure that we can continue to tell future generations to get out into the fresh air with a clear conscience, we are implementing measures that will make the entire TROX GROUP CO₂-neutral.

By helping to ensure that fresh, healthy air is available to everyone, we want to play our part in helping to create a better quality of life and promote stable health – and thereby offer us all a future in which we can live happily and well. By the end of 2021, approx. 320 million* people around the world had access to fresh air thanks to TROX and its ventilation technology. We intend to increase this figure to approx. 350 million* by 2025.



*Calculation basis: Total volume flow rate of air terminal devices and air-water systems in relation to sales, extrapolated to account for inflation.



'OUR GOAL IS FOR THE ENTIRE TROX GROUP TO BE CLIMATE-NEUTRAL BY 2040. AT TROX, THIS GOAL HAS TAKEN ON A LIFE OF ITS OWN – IN THE GMBH, IN THE SUBSIDIARIES, IN THE DEPARTMENTS, WITH THE PEOPLE. WE UNDERSTAND THAT AN ECOLOGICALLY AND ECONOMICALLY SOUND FUTURE DEPENDS ON OUR ACTIONS TODAY, HOW CONSISTENT WE ARE IN IMPLEMENTING SUSTAINABLE PRACTICES, IN RETHINKING STRUCTURES AND ESTABLISHING NEW MODELS. WE WANT A CLIMATE-NEUTRAL TROX GROUP AND WE ARE WORKING HARD TO ACHIEVE THIS.'

2040

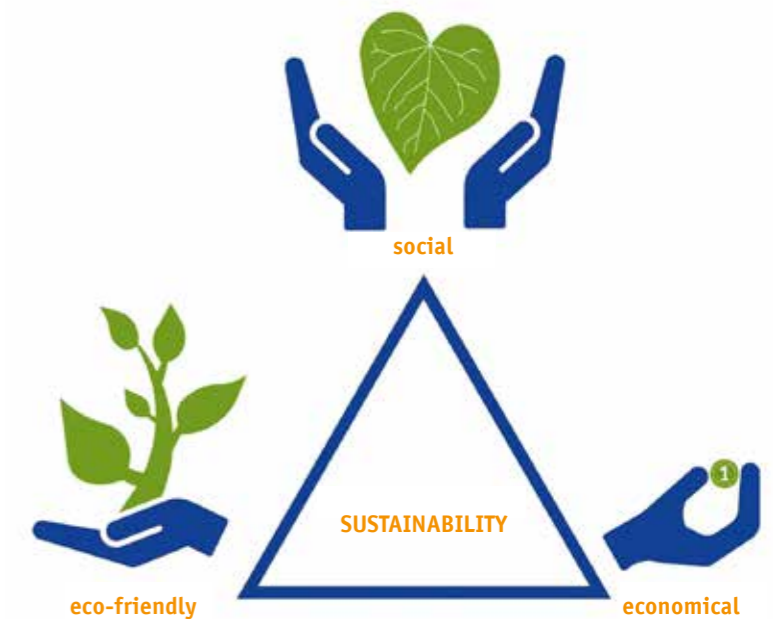
Climate-neutral by 2040! Our goal changes decisions.

We have given ourselves a period of 18 years to achieve a major sustainability goal: climate neutrality – across the entire TROX GROUP.

Admittedly, our goal is ambitious, but it also inspires ideas that change everything and challenges existing priorities. We can already be proud of what we have achieved so far. We are making great headway on our path to achieving climate neutrality by saving energy, increasing efficiency and minimising resource consumption.

Because TROX has made the decision to strive for sustainability that will be truly effective. In doing so, we have set out clearly defined interim goals to serve as an engine for motivation and action.

**DETERMINEDLY
MOVING TOWARDS A
SUSTAINABLE FUTURE**



Our interim goals up to 2025



Basis	I.	II.	III.	IV.
Financial stability	Healthy air	Energy + emissions	Material + waste	Employees + company
X-FIT+ programme: €700 million in sales and 8% EBIT in 2024	We will offer fresh air to 350 million people	1. Our production facilities will be climate-neutral 2. We will reduce the CO ₂ emissions from our products and perform life cycle assessments 3. Thanks to our TROX system technology, our customers can save more than 1,900 GWh of energy	We will increase the recycling rate of the GmbH to 90% and introduce a globally standardised waste management system at all locations	We will check at least 90% of our suppliers for sustainability and train at least 90% of TROX employees in core areas

So that we can take more concrete steps to achieving our ambitious core goal of climate neutrality by 2040, we have set out clearly defined interim goals for the next four years. Our X-FIT+ programme will help us to achieve these medium-term goals. By consistently managing and supporting all measures to save energy, increase efficiency and conserve resources in TROX GmbH during the course of the programme, we are aiming to achieve annual sales of €700 million and an EBIT increase of 8% by 2024.

This is a solid financial basis for our interim goal of promoting the health of 350 million people with fresh air by 2025. By this point in time, we also intend to be running our production facilities around the world in a CO₂-neutral manner. To this end, we will increase our use of green energy and invest in solar energy and other alternative energy sources. We believe that these investments in CO₂-reducing energies are an investment in a sustainable, stable future for the TROX GROUP. We will compensate for any residual CO₂ emissions with appropriate certificates.

We plan to reduce the energy requirements of our products and systems by 1,900 GWh for our customers. We also want to be able to clearly state the result of the life cycle assessment of our products.

When it comes to material and waste, we will also work consistently towards achieving a recycling rate of 90% within TROX GmbH. Moreover, we intend to introduce uniform regulations as part of a sustainable waste management policy that will be binding for the entire TROX GROUP. And, last but not least, we will also be focussing on the well-being of people by reviewing the sustainability status of at least 90% of our suppliers and increase the training of our employees in the core areas to an equally high level.

In order to achieve our goals, we will be changing processes, concentrating on alternative energies, implementing innovative systems, calculating the CO₂ emissions generated by our business activities and compensate for them. To do all this, we will be utilising a single formula – the TROX climate formula.

TROX CLIMATE FORMULA >

The TROX climate formula



OUR PRIMARY GOAL IS TO BE CLIMATE-NEUTRAL 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**



Sustainability with good leadership

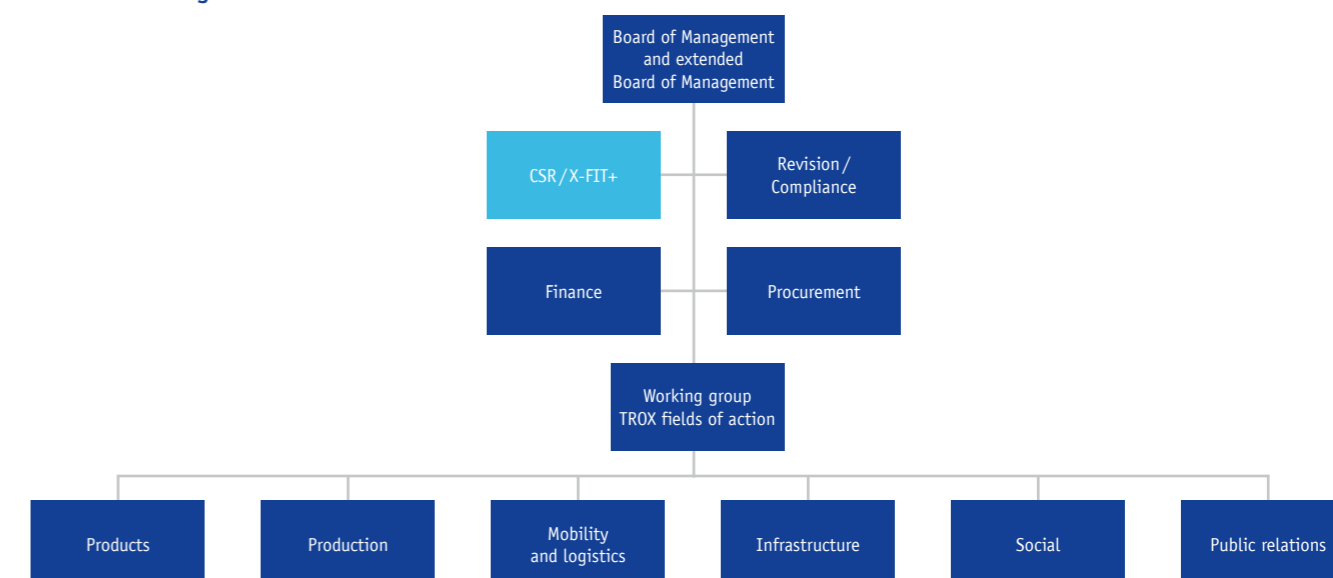
With clear structures and responsibilities, we are steering the sustainability development of the TROX GROUP towards climate neutrality.

Behind the sustainability goal of climate neutrality for our TROX GROUP is a management team that is working hard to implement the right strategy and organisation to achieve this goal. At TROX, we work with a sophisticated organisation, one where the management exemplifies an open culture and way of working. The dialogue between management and employees is always in the foreground. Concrete goals are consolidated in regular feedback sessions, which allow us to promote constructive interaction to drive the development and implementation process for concrete sustainability measures. Clearly structured processes and responsibilities support efficient cooperation.

For this reason, we set up a permanent working group for the six fields of action that are relevant to TROX – products, production, mobility and logistics, infrastructure, social matters and public relations. The group is in constant contact with all the divisions involved in sustainability decisions. Our assessment of this organisational structure thus far has been very positive. Our employees have become co-creators who, together with our management team, are working to drive forward the CO₂ neutrality of TROX in all areas.

WORKING TOWARDS CLIMATE NEUTRALITY

The TROX CSR organisational structure



We rely on productive dialogue to ensure sustainability success.

Our sustainability management is strategically geared towards a constant dialogue with stakeholders. For us, this is an important tool to be able to incorporate the wishes and requirements of our stakeholders as well as socially relevant and ecological developments into our sustainability decisions.

At TROX, the Board of Management and extended Board of Management are responsible for defining and achieving the company's sustainability goal. They set the direction and their dedication and commitment to the topic allows them to assume a role model function in practised sustainability.

Our CSR (Corporate Social Responsibility) department manages the processes that are needed to achieve our climate target. The work of this department includes enabling the key performance indicators in all areas of the company to be measured, further expanding their scope and driving forward the sustainability development of the entire TROX GROUP. The overriding priority here is the provision of information and input in all directions. In addition, direct contact with other companies and associations provides an insight into how sustainability is dealt with outside of TROX GmbH.

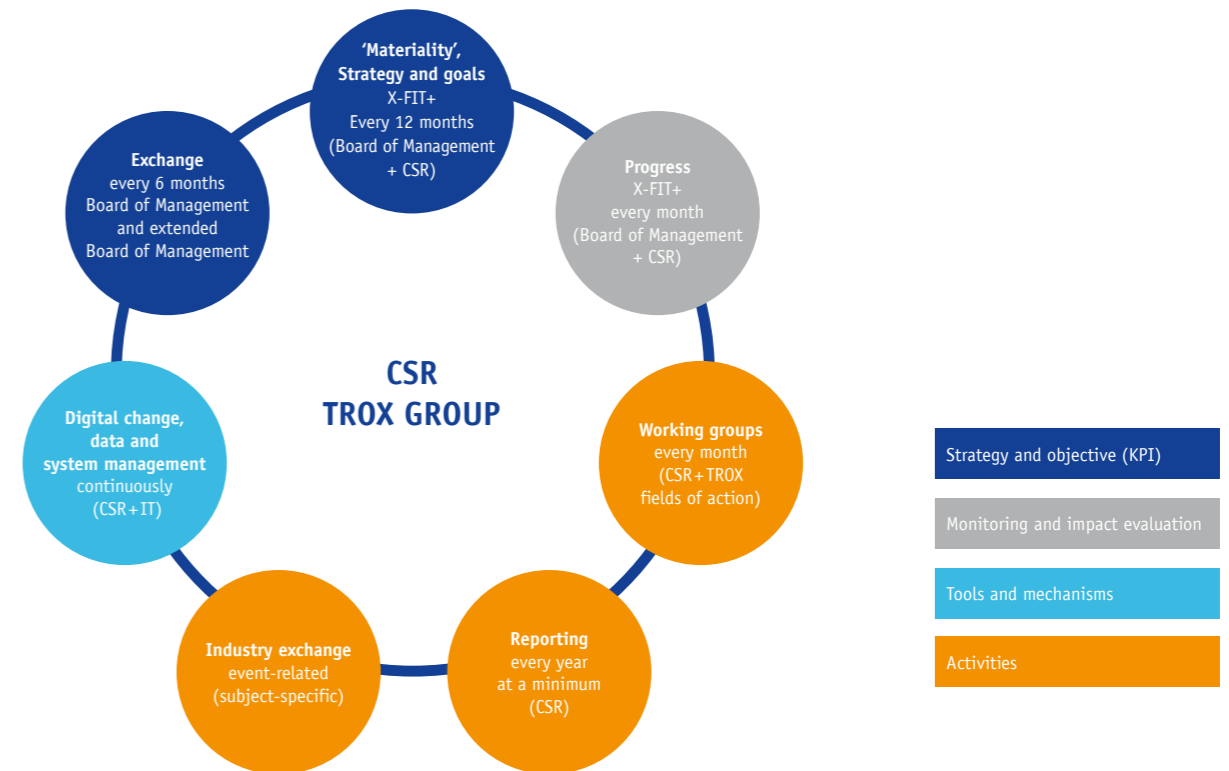
The CSR department incorporates the input that has been collected from this procedure into the work of the TROX fields of action working group, which works on precisely measuring all key performance indicators and implementing defined measures.

In every phase of our sustainability development, the flow of information across all levels is particularly important to us. This is because this interaction of strategic goals, internal concerns and external influences ultimately shapes the social, ecological and economic development of TROX and determines our contribution to protecting the environment.

Information exchange and interaction take place with productive regularity.

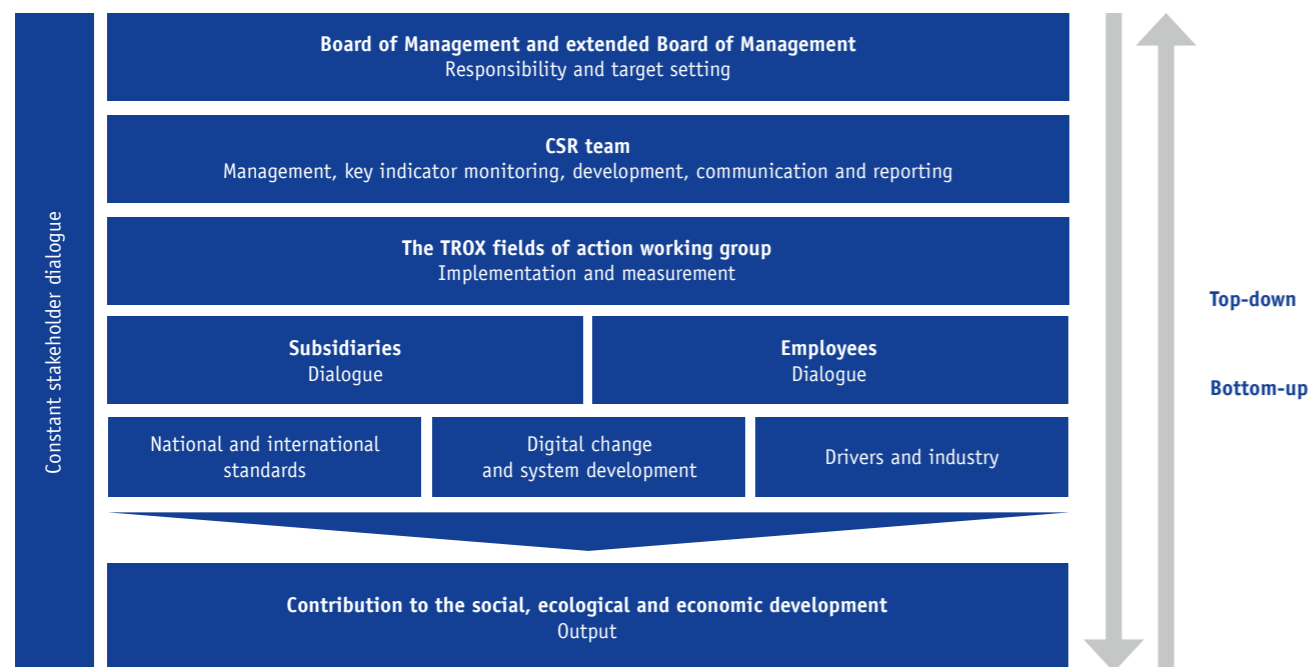
In order to ensure a smooth flow of information and to simplify the interaction processes between all involved, we rely on the regular exchange of information and knowledge.

The TROX CSR information and interaction cycle



TO ENSURE TRANSPARENCY AND PROGRESS, TROX RELIES ON CLEAR STRUCTURES AND REGULAR EXCHANGE

The TROX CSR dialogue structure



Also permanently in place: TROXellence, our continuous improvement system

The implementation of TROXellence as part of our organisational development enables us to systematically support our employees to play an active role in strengthening productivity and the principles of humanity at TROX. This, in turn, allows us to work together more effectively. We use two standardised methods to achieve this: the TROX Production System (TPS, see page 73) and the TROX Administration System (TAS), both of which help to identify and harness potential. All measures and projects initiated via TPS and TAS are managed and monitored in our TROX X-FIT+ programmes.



With structures like these, we ensure that potential for improvement is identified and systematically supported and managed in terms of its implementation. The specialist departments also stay in contact with each other in this context to guarantee transparent and trustworthy conduct.

The TROX sustainability strategy

We build on values that embody our ideals.

TROX's global market leadership is the result of the right decisions and a great deal of commitment, of innovative ideas and top performance – all demonstrated by the people in this company. Together we create and live by values that strengthen our group of companies both externally and internally. The values of our collaboration reflect both the standards for our products and our brand promise and are therefore fully integrated. The values that we subscribe to and that guide our actions as human beings ultimately find expression in our services, our products and, last but not least, our corporate character or image.

The values we have developed serve to reinforce our reputation as a reliable partner on the market and strengthen our working environment, where motivation and fair cooperation are the top priority. Against this background, sustainability is also something that all TROX employees work hard to achieve, as it paves the way to achieving more together and to making visions a reality more quickly.

Our sustainability vision is for TROX to be the most sustainable business in the industry, and to be perceived as innovative, trustworthy and transparent.

This vision is the starting point of our sustainability strategy and it is our mission statement for sustainable thought and action across the entire TROX GROUP. Because it is a vision that is based on values with which TROX employees identify.

TROX IS THE MOST SUSTAINABLE BUSINESS IN THE INDUSTRY, AND IS PERCEIVED AS INNOVATIVE, TRUSTWORTHY AND TRANSPARENT

SUSTAINABILITY STRATEGY

Five strong values for a strong TROX GROUP.

Together with employees from the Works Council and the extended Board of Management, we at TROX asked ourselves the questions: what strengths define us as people and as a company and how do we want to treat each other? Five values have emerged that very authentically reflect the identity of the TROX GROUP and are being increasingly and consciously practised by our employees in each of our companies.

1 TRUST

Trust creates openness. This value also incorporates confidence in one's own abilities as well as in the commitment and competence of colleagues. The resulting mutual support – personal and professional – evolves to form tight-knit teams that are innovative and successful today and in the future.

2 SAFETY

A good sense of safety and security is the basic requirement for motivation and willingness to perform. With their ability to think and act in a customer-oriented, cost-conscious manner, TROX employees strengthen the company and thus also secure their jobs. At the same time, they actively help to make workplaces safe and eliminate sources of danger.

3 RELIABILITY

TROX should continue to be valued as a reliable partner in the future. That is why it is so important to TROX employees that they work conscientiously and take responsibility. This tremendous dedication and commitment, which is evident in both their cooperation with colleagues and with customers and suppliers, is a reflection of their reliability, and thus the reliability of TROX.

4 QUALITY

Thanks to our employees, the TROX name stands for the highest quality around the world. The high demands they place on their own work mean they also meet the quality requirements of our customers. High-quality products, a high level of competence, clean workmanship and the best service define the quality standard that has been set by our employees. Today and in the future.

5 SUSTAINABILITY

When it comes to achieving our sustainability goal of being climate-neutral by 2040, our employees play an active role through their enormous commitment and contribution of ideas. This means that we can rely even more consistently on efficient technologies, environmentally friendly materials and more sustainable manufacturing and delivery processes – and also help to make small but meaningful improvements in day-to-day life.

In addition: three individual values for each TROX company.

Each TROX company has also developed three additional values that are unique to their company and circumstances. In this way, our companies are given the space to introduce precisely those values that are of particular importance to them.



- TROX Austria + CEE, TROX GmbH, TROX BSH Technik Polska, TROX HGI, TROX TIBA, TROX Middle East
Tolerance, fairness, authenticity
- TROX France
Respect, team spirit, boldness/transparency
- TROX HESCO Switzerland
Appreciation and respect, information and communication, career advancement and development
- TROX Denmark, TROX Auranor Norge
Solidarity and tolerance, fairness, commitment
- TROX South Africa
Integrity, customer satisfaction, trust
- TROX Argentina
Respect, integrity, innovation
- TROX do Brasil
Ethical conduct, commitment, respect
- TROX TECH-TRADE, Czech Republic
Family atmosphere, teamwork, individuality
- TROX X-FANS and Dr. Emer
Goal-oriented approach, respect and fairness, agility (flexibility)
- TROX Australia, TROX Hong Kong, TROX India, TROX Malaysia
Teamwork, communication, commitment (attention)

- TROX RUS
Responsibility, fairness, sincerity
- TROX Belgium
Respect, commitment, customer orientation
- TROX Netherlands
Teamwork, service, innovation
- TROX Air Conditioning Components (Suzhou)
Teamwork, communication, diligence
- TROX UK
Customer orientation, well-being, teamwork
- TROX KS Filter
Openness, trust, responsibility
- TROX España
Dynamism, ambition, professionalism
- TROX Turkey Teknik
Solution-oriented partnership, people-focused, productivity
- TROX Maroc
Respect, commitment, professional development
- TROX Italia
Availability, fairness, courage
- TROX México
Ethical conduct, cooperation, fairness

We have a mission.

Our goal is to be able to provide everyone, everywhere in the world, with access to good, healthy air. We have not just been pursuing this mission since the coronavirus pandemic. It is a goal that is rooted in our basic set of values and to which the TROX GROUP has been committed for decades: 'The human being is the yardstick, and people's well-being is our goal.'

And this is where our sustainability strategy comes full circle. Because our vision of being the most sustainable company in the industry inevitably, and through the driving force of our lived values, leads to the expansion of what we can achieve in terms of making fresh, healthy air indoors accessible to everyone.



The TROX sustainability strategy



Just as important: What do you expect from us?

Our strategic focus on sustainability includes the relevant requirements, wishes and goals of our stakeholders. How can we achieve more together? And as our stakeholders, what expectations do you have of TROX when it comes to sustainable commitment? We are listening.



> Customer

'The issues of sustainability and building costs are closely intertwined today. For us, as a trade fair company with its own event premises accommodating eleven exhibition halls and two congress buildings, sustainability is always synonymous with longevity. The energy-efficient and high-quality products and systems from TROX are precisely how we ensure this longevity. In addition to the energy efficiency factor, reliability in intermittent operation over many years is a very important element in all our considerations and in the design of construction and maintenance measures. TROX offers us a high level of safety and quality here.'

Uwe Behm, Managing Director
Messe Frankfurt GmbH



> School principal

'Because we take our educational mandate seriously, we also have to ensure that learning takes place under the best possible conditions. We are delighted to be able to provide our students with a consistently good learning environment with a high proportion of fresh air. These are simply the best conditions for successful learning. To conserve our resources, it is very important that the ventilation and air-conditioning units from TROX work particularly energy-efficiently and quietly.'

Dr. Susanne Marten-Cleef, Principal

Julius Stursberg Secondary School, Neukirchen-Vluyn



> Supplier

'Knowing that we have a partner at our side who believes in long-term partnerships and who supports us in our own sustainability goals gives us great security. Trust and loyalty are prioritised in our working relationship with TROX, as they provide the foundation for the creation of joint concepts that benefit everyone.'

Lars van der Haegen, CEO
BELIMO Holding AG



> Construction manager

'I welcome TROX's commitment to sustainability. For me, TROX is sustainable because their devices and components are high-quality, problem-free, practical and economical. The project support that I receive, from the initial design work to the seamless integration with the building management system, etc., speeds up and simplifies the processes directly. This saves time, delays and costs. That is what defines sustainability for me.'

Uwe Kötteritzsch, project leader (HBV)

Niedecken & Schröder Klimatechnik GmbH & Co. KG



> Employee

'The fact that my employer puts such an emphasis on sustainability and plays such an active role here makes me very proud. It feels good to work for a company that cares about the environment and people. At the end of the day, I want to feel valued at my job, work well with my colleagues and get ahead. Initiatives such as the values campaign support this and strengthen the community. And I am very happy to play my part.'

Kathrin Kühne, TROX employee

Assembly of decentralised ventilation units, Neukirchen-Vluyn production facility



> Carrier

'For us, the supply chain right through to the customer is naturally of particular importance. It is why we place such an emphasis on our long-standing good relationship with TROX, a partnership that offers mutual benefits. Sustainability in transportation is an important issue where we share common interests. This cooperation gives rise to concepts that offer stability to both sides. Perfect for a shared sustainable future.'

Gregor Roes, Managing Director

Wwe. Theodor Hövelmann GmbH & Co. KG

We are in dialogue with our stakeholders

STAKEHOLDERS	TOPICS	FORMS OF DIALOGUE
› Customers	<ul style="list-style-type: none"> • Products that significantly improve the quality of indoor air and well-being • Energy efficiency, quality, safety and excellent product performance • Cost savings through system solutions • Transparent business practices and compliance • Human rights in the supply chain • Reduction of emissions (CO₂, contaminants, noise, waste) • Awareness of values • Sustainable business practices 	<ul style="list-style-type: none"> › Support from specialists › myTROX customer portal › Online product configuration › Easy Product Finder (EPF) › Trade fairs › TROX Roadshow › Customer enquiries › TROX Trust Channel whistle-blower system › TROX life customer magazine › TROX ACADEMY training
› Suppliers and business partners	<ul style="list-style-type: none"> • Responsible purchasing • Long-term supplier relationships based on partnership • Product quality / safety • Sustainable logistics and packaging • Ensuring CSR in the supply chain • Compliance 	<ul style="list-style-type: none"> › Code of Conduct › Supplier evaluation and feedback process on sustainability issues › Development of logistics concepts together with carriers › Purchasing principles › TROX Trust Channel whistle-blower system
› Employees	<ul style="list-style-type: none"> • Promoting health and well-being • Occupational safety and protection • Appropriate and fair remuneration • Sustainable personnel development • Diversity / equal opportunities • Career / training / further training / benefits • Work-life balance • Management style • Transparency • Employee participation • Meaningful and achievable targets • Company image • Company values 	<ul style="list-style-type: none"> › Intranet › Regular employee appraisals › Jointly developed values campaign › Cooperation with the Works Council › Company agreement › Employee surveys › Training / further training / TROX ACADEMY › TROX aktuell employee magazine › Special work-life offers › Employee suggestions › TROX-X-FIT+ health programme › TROX Trust Channel whistle-blower system
› Investors (Heinz Trox Foundation, banks, etc.)	<ul style="list-style-type: none"> • Business development • Sustainable business practices • Strategy • Product innovations 	<ul style="list-style-type: none"> › Annual report / financial statement › Quarterly reporting › Shareholders' meeting › Sustainability report › (Telephone) conferences / meetings
› Science and university	<ul style="list-style-type: none"> • Exchange, cooperation and knowledge transfer between research and industry • Promotion of research and teaching • Attractive job prospects for graduates • Development of energy-efficient and sustainable products / technologies • Healthy indoor air • Development of new technologies 	<ul style="list-style-type: none"> › Joint research and cooperation with universities and students › Support of research projects › Trade fairs / symposiums / Aachen Day › Allocation of bachelor and master positions
› Press / media	<ul style="list-style-type: none"> • Company development, activities and promotions • Transparent and accountable financial and non-financial reporting • Innovations • Healthy indoor air 	<ul style="list-style-type: none"> › Interviews › Information events / trade fairs › Press releases › Social media channels › Symposia / Aachen Day
› Politics, committees and associations	<ul style="list-style-type: none"> • Compliance with legal regulations • Transparency and compliance • Reduction of emissions (CO₂, contaminants, noise, waste) • Sustainability promotion / standards • Increase in building energy efficiency • Knowledge transfer / industry exchange on economic and sustainable topics • Development of innovative technologies, products and processes • Healthy indoor air 	<ul style="list-style-type: none"> › Association / committee work › Information events / trade fairs › Discussions with politicians › Symposia / Aachen Day › Industry and experience exchange
› Public relations	<ul style="list-style-type: none"> • Company development, activities and promotions • Sustainability developments • TROX as an employer, market driver and innovator • Healthy indoor air 	<ul style="list-style-type: none"> › Website › Annual report / financial statement › Sustainability report › Press releases › Funded projects › Factory tours (recommended following Covid)



Christine Roßkothen
Head of Corporate Social Responsibility (CSR) TROX GmbH
Board member of the Heinz Trox Foundation

‘IT’S NICE TO KNOW THAT THERE ARE COMPANIES LIKE TROX FOR WHICH MAXIMISING PROFITS ISN’T THE TOP PRIORITY. OFF COURSE, ECONOMIC GROWTH IS ESSENTIAL TO BE ABLE TO SURVIVE IN THE MARKET – BUT AS A FOUNDATION-OWNED COMPANY, WE HAVE GEARED OUR BUSINESS TOWARDS ACHIEVING SUSTAINABILITY AND ARE THUS FOCUSED ON LONG-TERM SUCCESS INSTEAD OF SHORT-TERM PROFITS. IT’S A GREAT FEELING!’

SUCCESS

We strive for the greatest possible sustainability for good reason

Sustainability is at the heart of TROX. Heinz Trox's guiding principle 'The human being is the yardstick, and people's well-being is our goal' puts people and their well-being at the centre of everything we do. Because people change the world – on a sustainable basis.

It was with this guiding principle that he set the direction for TROX and anchored it with the founding of the Heinz Trox Foundation in 1991 as the main shareholder of TROX GmbH.

The Heinz Trox Foundation is a non-profit, supporting foundation that pursues charitable goals such as securing basic needs, e.g. through social welfare work and support for people in need, youth campaigns and elderly care. It also supports art, culture and sport. Heinz Trox focussed on funding for education and science, because he fundamentally believed these two aspects are the cornerstones of sustainable human development.

As the property of a foundation, TROX is, by definition, particularly sustainable. Experience has shown that foundation-owned companies live longer – thanks to their long-term orientation and the stability that goes with it. In this sense, short-term profits are not the goal of the Heinz Trox Foundation, but rather the consistent further development of the TROX GROUP. This is the only way to strengthen the company, further consolidate its pioneering status as a global player and retain its focus on the well-being of people.

This special orientation and symbiosis between the foundation and the company was highlighted in an exemplary relief campaign in 2021. In July 2021, a donation of €120,000 was collected for the flood victims from the Ahr Valley in Germany: €25,000 was raised by TROX employees alone, €20,000 came from TROX GmbH and €75,000 was donated by the Heinz Trox Foundation.

This commitment is testament to the fundamentally sustainable way of thinking at TROX. And it is a good example of the strong bond between the foundation and the company.

TROX THINKS AND ACTS WITH A VIEW TO THE LONG TERM



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



SUSTAINABLE DEVELOPMENT GOALS

At the heart of all our endeavours are the 17 Sustainable Development Goals

The 2030 Agenda for Sustainable Development, which was adopted by all UN Member States in 2015 and set out 17 Sustainable Development Goals (SDGs), sought to provide a blueprint for global sustainable development.

We identify with these goals and feel that it is our duty to actively participate in their implementation to the best of our ability.

TROX IS COMMITTED TO THE 17 SDGS



TROX has always been particularly committed to 6 SDGs

TROX is committed to almost all SDGs. In line with our business activities, however, six of them have always been of particular importance to us. These include SDG 3 'Health and well-being', the relevance of which was highlighted once again in 2021 by the role of ventilation in the coronavirus pandemic.

**SDG 3
STATUS 2021
IN FOCUS
FOR TROX**



3 GOOD HEALTH AND WELL-BEING

SDG 3 – Good health and well-being
 In 2021, the protection of health from the permanent threat of SARS-CoV-2 infection took on a central role all over the world. This was also, and particularly, the case at TROX. This is because people and their well-being are at the heart of our company philosophy and the engine driving all of TROX's actions and endeavours. In addition, the special relevance of virus-contaminated air as a transmission medium has only served to reinforce our position as an effective solution provider with 70 years of experience in the field of ventilation technology.

Individually designed room ventilation solutions from TROX guarantee good, healthy air indoors, minimise the risk of infection and promote health. Because we believe that air is an essential element of life that can only keep us healthy if it is fresh and clean. Moreover, all of our actions are fully in line with SDG 3: from product development to product recycling, all of our processes are designed to conserve resources, we continuously strive to promote the well-being of our employees and society and we actively pursue environmental and climate protection. We think long-term and across generations – for the benefit of people and their health.

8 DECENT WORK AND ECONOMIC GROWTH

SDG 8 – Decent work and economic growth
 As an international group, an important priority for TROX is to ensure that employees around the world are treated with respect and fairness in accordance with the ethical TROX guidelines of fairness and integrity, to support them individually and to eliminate hazards. On this basis, each individual contributes to economic growth in their country – all working individually but pulling together.

SDG 9 – Industry, innovation and infrastructure
 A strong, sustainable industry promotes social prosperity and protects the environment. Of course, our commitment applies in several respects. With numerous technologically ground-breaking innovations, TROX is an industry pioneer when it comes to increasing efficiency and thus saving energy and CO₂ in product operation. In addition, we are investing to ensure ever greater sustainability in production and infrastructure.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

SDG 12 – Sustainable consumption and sustainable production
 TROX thinks long-term in every respect. The demand for our product quality guarantees a long service life with high energy and material efficiency, as our product design processes are already carried out in a material-saving and sustainable manner. In the day-to-day processes at TROX, we create and strengthen sustainable awareness – from the conscientious separation of waste to the reduction of paper consumption.

SDG 13 – Climate action
 TROX has always been dedicated to optimising its products' energy consumption. We are also constantly investing in ever more sustainable production processes and systems. This has allowed for a significant reduction of CO₂ emissions.

13 CLIMATE ACTION

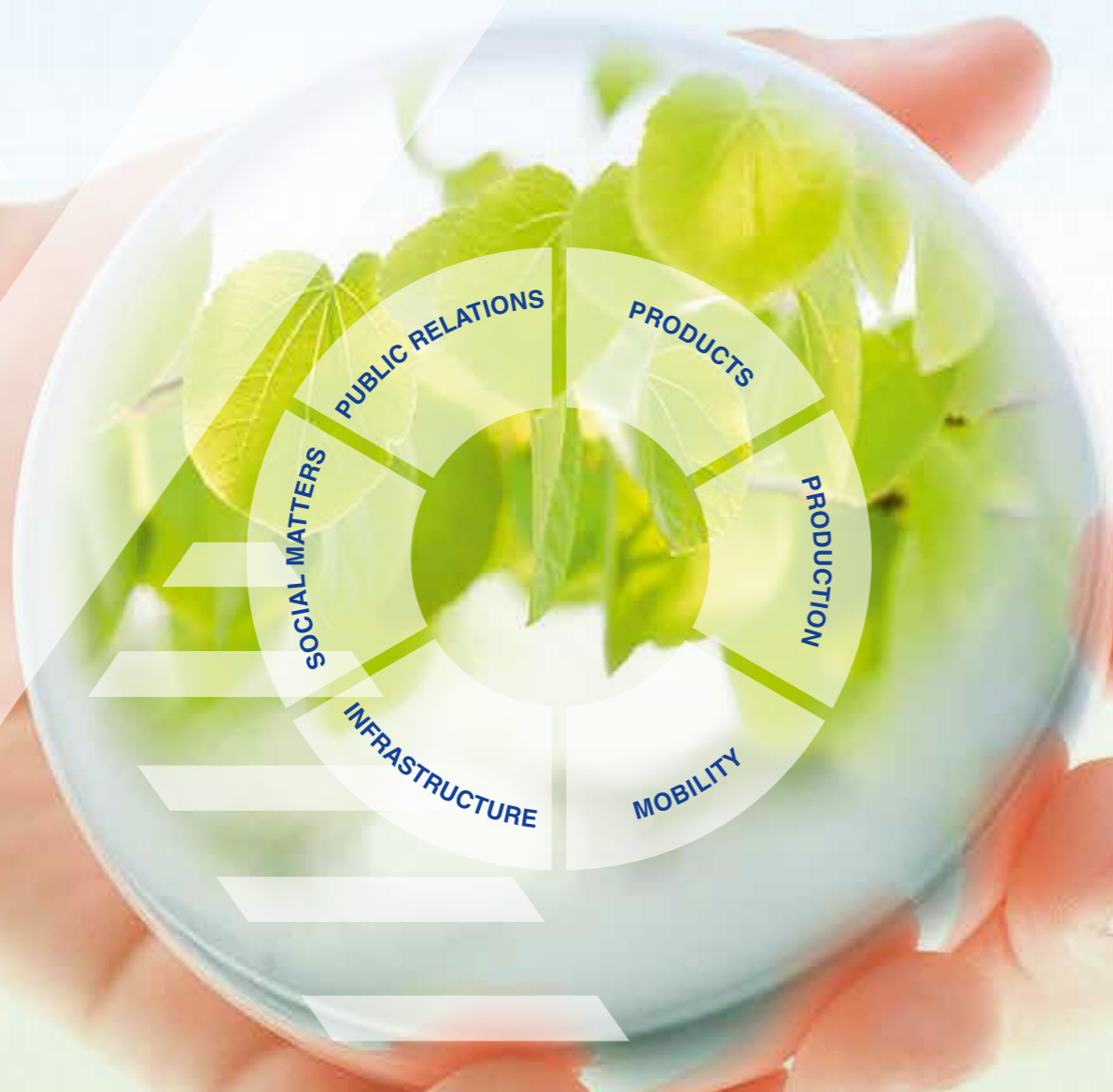
17 PARTNERSHIPS FOR THE GOALS

SDG 17 – Partnerships to achieve goals
 Right from the start, TROX has been involved in all important associations, committees and organisations of its industry, and has been taking on a leading role when it comes to promoting sustainability and quality standards that will reduce CO₂ emissions. In our supply chains, we rely on partners that meet our sustainability standards.

The TROX fields of action

We act!

On the basis of the 17 Sustainable Development Goals, TROX has identified six strategic fields of action that are essential for the company. Within these fields of action, we work year after year to develop concrete measures that enable us to move closer to achieving our sustainability vision, while at the same time advocating a balance between economy, ecology and social issues for the benefit of people.



FIELDS OF ACTION

Following our climate protection path with clearly defined steps

Stopping climate change is a major global goal. We want to play a role here – with initiative, a lot of commitment and with a system.

That is why we have defined strategic and operational sustainability goals in each of our six fields of action, and these are constantly being expanded to incorporate current developments such as the need to minimise the risk of infection through mechanical room ventilation.

PRODUCTS

Our medium-term goals up to 2025 are to be in a position to offer healthy fresh indoor air to 350 million people through innovative, energy- and resource-efficient ventilation and air-conditioning solutions, to create 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:

- Offer safe fresh air to 213 million people through fire dampers.*
- Offer comfortable fresh air to 320 million people through air terminal devices.*
- Offer demand-based fresh air to 254 million people through volume flow controllers.*
- Offer clean fresh air to 85 million people through filter solutions.**
- Offer treated fresh air to 33 million people through air handling units.
- 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.
- Develop new strategies for the realisation of a transparent, market-oriented life cycle assessment for all products.
- Focus on energy efficiency and resource efficiency throughout the product life cycle.
- Optimise products and systems over the entire life cycle, taking into account the frequently occurring partial load cases.
- Increase building efficiency through on-time, budget-compliant project implementation with TROX complete system solutions including building automation.



TROX thus contributes to realising these SDGs.

* Calculated over a service life of our products and systems of 25 years
 ** Calculation for 2025

PRODUCTION

Our strategic goals are to increase the sustainability of our production processes worldwide in terms of waste avoidance to pave the way for a more efficient use of materials as part of the TROX Production System (TPS) and to review at least 90% of our suppliers for sustainability by 2025.

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

- Streamline production processes and optimise the material flow.
- Continue to develop TROX's management system that covers the areas of quality, energy and environmental management, as well as work and health management.
- Invest in hardware and software components to ensure precise recording of energy data.
- Use the TROX production system TPS to improve production and administration processes across the entire TROX GROUP.
- Use our energy audit system to improve the energy efficiency of investments.
- Optimise our staff members' working conditions continuously, and record and remedy potential risks.
- Reduce cuttings and waste.
- Ensure a transparent, reliable sustainability review of our suppliers, who generate 90% of the product-relevant CO₂ emissions.
- Together with suppliers, develop an action plan to identify the need for action.



TROX thus contributes to realising these SDGs.

MOBILITY AND LOGISTICS

Our strategic goal is to reduce CO₂ emissions in the areas of logistics, transport and traffic and to reduce the consumption of packaging material.

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

- Optimise warehousing to reduce specific power consumption.
- Continue to expand our network of production facilities to be closer to our customers.
- Minimise transport by establishing new production and storage facilities.
- Pool transport for specific regions to allow for shorter delivery routes.
- Gradually reduce the use of resources for packaging materials through reusable packaging.
- Gradually replace our vehicle fleet with electric vehicles.



TROX thus contributes to realising 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:

- Convert our energy supply to green energy.
- Invest in solar energy and other alternative, CO₂-reducing energy sources.
- Compensate for remaining CO₂ emissions with appropriate certificates.
- Set up carbon-reduced or ideally carbon-neutral production in all new facilities, as in the case of TROX Auranor in Norway.
- Reduce primary energy and water consumption by investing in comprehensive building modernisation measures.
- 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.
- Develop a group-wide uniform waste management system.
- Improve our digitisation concepts to continue to be able to operate digitally in a future-oriented manner and to stay in touch with people, even in times of COVID-19.



TROX thus contributes to realising these SDGs.

SOCIAL MATTERS

Our strategic goal is to continue to live our corporate philosophy 'The human being is the yardstick, and people's well-being is our goal' within the entire TROX GROUP.

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

- Invest in our staff members' safety, health and well-being in the workplace.
- Maintain awareness of and appreciation of our staff members' diverse range of abilities and experiences and strive to use their individual potential to ensure that they enjoy their job and are able to work productively.
- Refine the education and training opportunities for our employees, making participation easier by expanding high-quality webinars and training at least 90% in core areas such as occupational and IT security and compliance by 2025.
- Promote gender equality and strive to increase the number of women in leadership positions.
- Promote our staff members' financial and social situation through fair pay around the world.
- Promote our ethical guidelines around the world to ensure fairness, integrity and equal opportunities and fight corruption and discrimination.
- Accordingly, aim to review at least 90% of our suppliers for sustainability and thus for compliance with our ethical guidelines by 2025.
- If action is required, develop an action plan together with our suppliers.
- Act worldwide on the basis of our jointly developed company values, which we continue to consolidate within the framework of campaigns and workshops.



TROX thus contributes to realising these SDGs.

PUBLIC RELATIONS

Our strategic goal up to 2025 is to further establish TROX in political spheres and among the public as the most sustainable company in the industry.

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

- Intensify our active leadership role and involvement in national and international associations, organisations and committees to enforce sustainable standards and quality requirements, as well as specific environmental and energy targets for the building industry.
- Increase our communication with our stakeholders digitally, through print media and in the press to make our sustainability goals and measures transparent and comprehensive.
- Expand the transfer of information and knowledge on the subject of sustainability in order to clarify to our stakeholders the importance of ensuring the well-being of people indoors on a scientific basis – a required minimum fresh air flow rate of 25 m³/h for good indoor air quality.



TROX thus contributes to realising these SDGs.

TROX's six strategic action areas for a sustainability vision that inspires us

Within our fields of action, we are passionate about and respectful of a sustainability vision that strengthens the entire TROX GROUP for the long term while protecting our planet:

'TROX is the most sustainable business in the industry, and is perceived as innovative, trustworthy and transparent.'

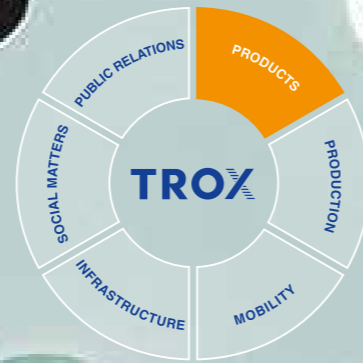




Ralf Joneleit
Head of TROX Technology

'AS VENTILATION EXPERTS, WE CAN DO A LOT TO ENSURE OR EVEN IMPROVE THE HEALTH AND PERFORMANCE OF PEOPLE IN BUILDINGS. OUR DEVELOPMENT OF INNOVATIVE, INCREASINGLY INTELLIGENT, DEMAND-BASED PRODUCTS AND SYSTEMS THROUGH TO COMPLETE SOLUTIONS OPENS UP A WIDE RANGE OF INDIVIDUAL OPTIONS FOR SUPPLYING PEOPLE WITH FRESH, CLEAN AIR IN AN ENERGY- AND RESOURCE-EFFICIENT MANNER. IT IS AN EXCITING CHALLENGE FOR WHICH TROX IS THE RIGHT PARTNER.'

PRODUCTS



Products

TROX products are constantly being reviewed and further developed in order to increase their efficiency, ecologically optimise their life cycle and maintain their quality, durability and functionality at the highest level – and of course to ensure that people can live a healthy life with fresh, clean air in rooms and buildings.

70 years of TROX also means 70 years of experience and competence in the field of ventilation and air-conditioning technology. A lot has changed in this time. TROX technology has become more and more efficient, energy-saving, resource-saving and comprehensive. True to our mission 'The art of handling air – for indoor life quality', our focus has always been on people and their well-being by ensuring good indoor air quality. **We offer fresh, healthy air to millions of people.**

In 2021 alone, we provided fresh, clean indoor air to another 10 million people worldwide. This means that we now offer fresh air to approx. 320 million people with our ventilation and air-conditioning technology – with better health, better performance and more comfort.

The numerous studies, which have increased due to the coronavirus pandemic, speak for themselves. They verify the many positive effects of fresh, clean indoor air on the human body, its well-being and its performance and they illustrate that the necessary room air conditions cannot be guaranteed without mechanical ventilation.

Our goal is to offer fresh, healthy air to a further 30 million people by 2025, and thus to a total of approx. 350 million people. In this way, we can continue to work for people within the meaning of the SDG 3 'Health and well-being'.



TROX X-CUBE air handling unit

Demand-based ventilation and control – this is how we ensure less energy consumption and CO₂ emissions with greater comfort.

Mechanically ventilating rooms that are empty at night, for example, unnecessarily burdens our climate and our resources. This is exactly where demand-based ventilation systems from TROX come into play.

In projects with systems such as our demand-based TROX X-AIRCONTROL room control system, the room air is controlled based on continuously recorded measurement data. This leads to a much more precise adjustment to the required energy demand and, in addition to energy efficiency, also increases comfort – while simultaneously improving acoustics, air quality and work productivity.

Calculations show the low primary energy requirements of air-conditioning and ventilation systems in projects with demand-based ventilation.

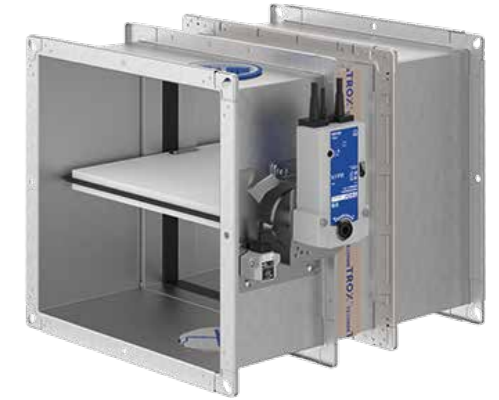
Take, for instance, a system controlled with constant pressure in the main duct and the picture becomes clear: a system without demand-based control consumes 53% more energy, while the demand-controlled system with damper blade position feedback reduces energy consumption by 29%. Our customers all over the world benefit from this tremendous energy efficiency.

There is enormous potential in terms of energy savings from the use of demand-based control with feedback on the damper blade position, and this can be further optimised if the volume flow controller, air handling unit and a higher-level control system are perfectly matched and ideally come from a single source (see p. 66).

From year to year, more and more projects are being equipped with demand-based ventilation systems from TROX. This is a development that serves to strengthen our commitment to sustainability in terms of product development and product improvement and benefits the climate.

An example of this is the new fire damper type FK2-EU, which replaces the FKS-EU and FK-EU types. This amalgamation process has clear sustainability benefits:

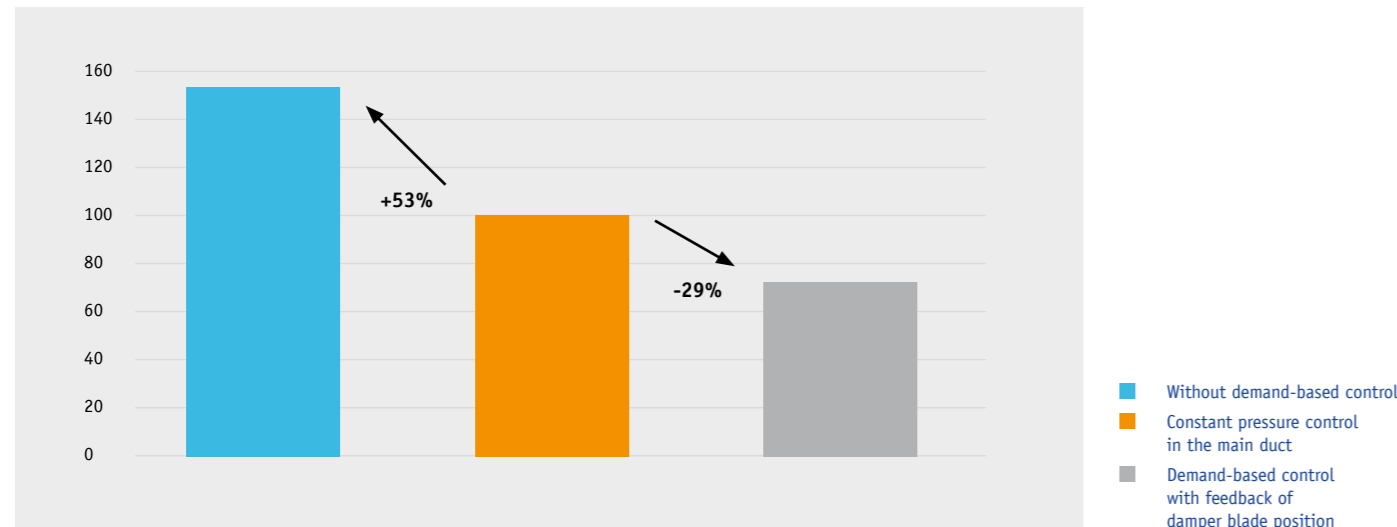
- 18% less material used thanks to the use of the latest manufacturing and forming technology and improved casing design
- Correspondingly reduced resource consumption
- Correspondingly reduced CO₂ emissions in the supply chain, as the material in a truck load is now sufficient for more fire dampers and therefore fewer transports are required
- Easier handling when transporting components to the construction site, as 250 fire dampers per truck weigh only 5.7 tonnes instead of 6.5 tonnes
- Reduction of the drive energy required by 3.4% via a reduction in the size of the drive
- Energy savings at fan level and noise reduction by reducing the pressure loss by an average of 33% at an airflow velocity of 4 m/s



New TROX fire damper type FK2-EU

In addition to these positive effects in terms of material use, energy consumption and CO₂ emissions, handling is simplified for customers, as only one fire damper has to be allowed for right from the design stage.

Energy requirement in relation to constant pressure control in the main duct



We achieve more with less – the TROX product portfolio consolidation.

TROX's tremendous innovative strength has produced many highly efficient and unique products. The constant product type expansion that went hand in hand with this was something that we needed to reconsider from a sustainability point of view. There are many products that only differ in minor points. Do these products really need to be manufactured, stored, certified, transported, etc. when you take into account all the corresponding material consumption? Or are there sensible streamlining processes within our product types that can make production, logistics and handling more sustainable?

We found our way. Some of our product types were already cancelled or replaced in 2021: by new, better, and in some cases more energy-efficient, products, by products with an optimised use of materials and resources or by existing better alternative products. In the fourth quarter of 2021, five types were cancelled in this way.



TROX pocket filter

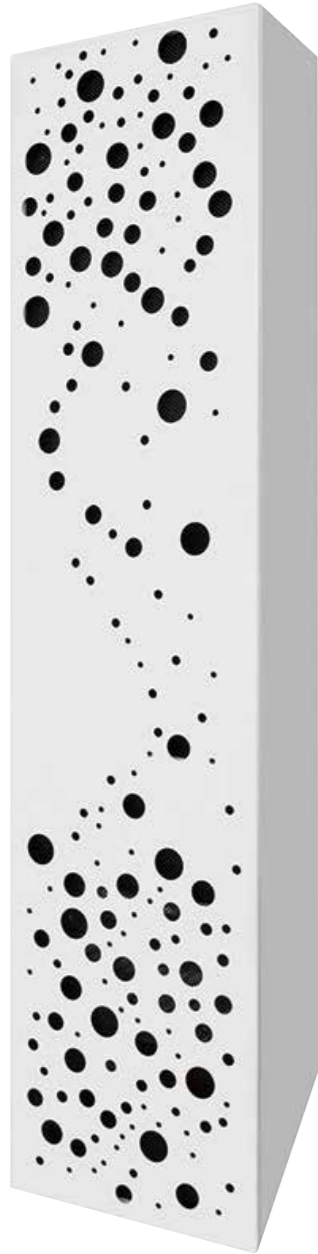
Our energetically improved filters pay off – for the environment and for our customers.

Increasing the energy efficiency of our products is and will remain a key concern for us in the fight against climate change. This is because the more energy our products save in operation, the less CO₂ is emitted. Our customers can also see the benefits for everyone.

Thanks to energetically improved TROX pocket filters, our customers saved approx. 5 million kWh and more than 1.8 tonnes of CO₂ in 2021 in comparison with the previous year.

Energy and CO₂ savings thanks to more energy-efficient pocket filters

	2020	2021	Savings	
			absolute	%
kWh/yr	279,169,171	274,033,092	4,975,263	2
CO ₂ kg	102,117,058	100,296,111	1,820,946	2



TROX SCHOOLAIR-V-HV

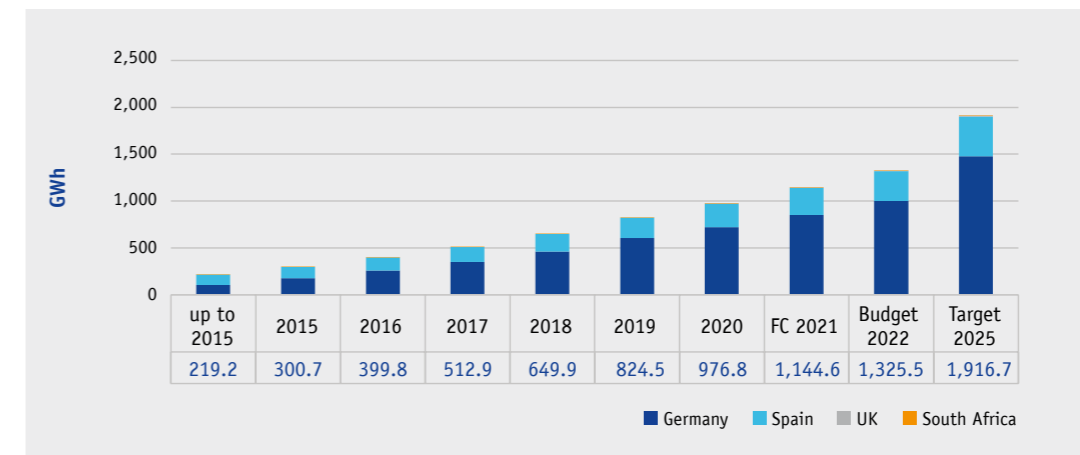
TROX VENTILATION AND AIR-CONDITIONING TECHNOLOGY PROTECTS PEOPLE'S HEALTH AND WELL-BEING

We utilise the climate protection potential of heat recovery.

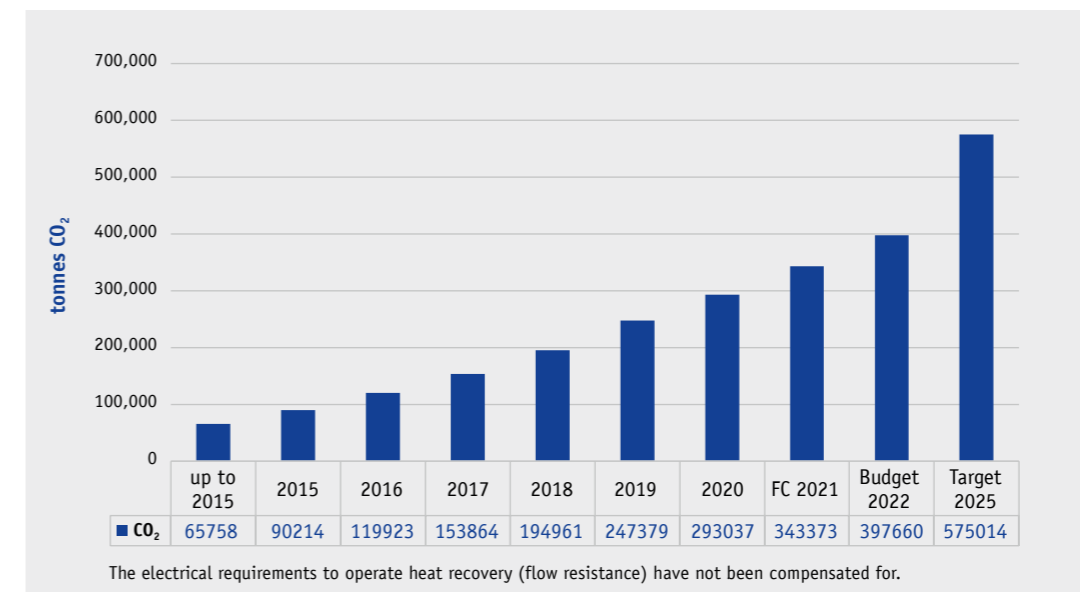
Numerous TROX products are equipped with heat recovery. The heat recovered in this way has great potential for saving energy and CO₂. In the period from 2014 to 2021, the recovered heat energy and the CO₂ savings generated with such TROX products increased more than fivefold. These calculations only take into account such TROX products in Germany, Great Britain, Spain and South Africa. Our goal is to further expand the trailblazing technology of heat recovery to allow our customers to save approx. 1.9 GWh of energy by 2025, thus paving the way for an almost ninefold reduction in energy consumption. We are working on global data collection.

TROX PRODUCTS QUINTUPLED ENERGY AND CO₂ SAVINGS DURING THE PERIOD 2014 TO 2021 THROUGH HEAT RECOVERY

Heat energy recovered annually through heat recovery



CO₂ savings as a result of reduced heat energy thanks to heat recovery (for 300 g CO₂ /kWh as an assumption for heating with gas)



Everything from a single source – added value for projects, the environment and economy.

When it comes to the refurbishment or new construction of large projects, the coordination of the various components of ventilation and air-conditioning technology is very complex; smooth interlinking of the various trades is an additional challenge. Longer construction times and higher construction costs are the rule rather than the exception.

Against this background, TROX has developed a concept that offers tailor-made, perfectly coordinated and interface-optimised complete solutions that also include building automation in addition to ventilation and air-conditioning technology. Everything from a single source.

The advantages of our complete solution are enormous:

- All building technology components are perfectly coordinated with one another.
- Interfaces are reduced to a minimum.
- Projects can be implemented faster and more cost-effectively.
- Safety is ensured for all processes.
- Design, execution, control and support all are under one umbrella to ensure maximum energy efficiency.
- The higher-level logistics planning combines driving and transport routes, thus also reducing CO₂ emissions.

THE TROX COMPLETE SOLUTION 'EVERYTHING FROM A SINGLE SOURCE' SAVES COSTS, TIME AND RESOURCES

TROX BUILDING SERVICES AND AUTOMATION



- > Reliability
- > Planning reliability
- > Appointment reliability
- > Reliability in the supply chain
- > Calculability
- > Cost savings

A look at the typical increase in construction time and construction costs of comparable public projects also clearly highlights the enormous economic advantages of the TROX complete solution. According to the 'Annual Analysis Germany 2021/2022' study carried out by BauInfoConsult GmbH, the economic damage caused by breakdowns, errors and delays in day-to-day German construction work amounted to roughly EUR 18 billion in 2020.

Poor communication on site, a lack of time, unclear responsibilities, a lack of interest on the part of the trades involved – all of these issues lead to delays that can cause aggravation and have an impact on subsequent construction projects. Meanwhile, numerous specialised lawyers and consulting firms have established themselves to clarify matters. Looking at the overall picture, this means that further resources are wasted.

Everything from one source, with one level of responsibility, is the logical approach for us to curb this waste of time, costs and resources. During the refurbishment of House M at the municipal hospital Karlsruhe, for example, the TROX complete solution spoke for itself. All the various parts of the ventilation and air-conditioning technology including heat recovery and fire and smoke protection technology lay in our hands – from design support to sizing and configuration through to electronics, integration into the central building management system and acceptance of the system and its system control. The positive result for customers, specialist consultants, HVAC contractors and system owners: fewer interfaces, on-schedule implementation and reduced costs with maximum safety, combined with perfectly integrated, energy-saving TROX technology.



To ensure greater sustainability, our focus is always on the entire life cycle of our products.

The sustainability of a product is determined by the material, design, production, transport, use and recyclability. To figure out the best way to ensure greater sustainability, TROX product management looks at the entire life cycle of a product.

Can materials be used that can be reused? Does the design increase the energy efficiency? How can material and thus resource consumption be reduced? Can the product be easily recycled? Precise recording of all parameters is essential for this.

Taking into account transport, material, purchased parts and the production process, a CO₂ footprint of approx. 70 kg was calculated for the TROX multi-leaf damper JZ-LL in 2021, for example. It became clear here that the area of material and purchased parts, which accounted for approx. 66 kg, offered the greatest potential for changes. All in all, these values are actually not too bad: the much smaller iPhone 12, which also has a much shorter service life (measured over its entire life cycle) has the same CO₂ footprint as our 1 m² multileaf damper, which has an average lifespan of 25 years.

In the future, we want to create a meaningful life cycle assessment for each of our products and are already working on ways to ensure strategically sensible and feasible implementation. Both the product-related CO₂ footprint and a much more detailed life cycle assessment – which also includes values such as ozone depletion, water pollution, etc. – will be used in the medium term. In this way, we will increase transparency with regard to the sustainability of our products and lay the foundation for further improvements in the direction of climate neutrality.



TROX multileaf damper JZ-LL



Dieter Becker
Head of Production

‘SUSTAINABILITY IS AN IMPORTANT TOPIC IN THE TROX PRODUCTION FACILITIES – BOTH NATIONALLY AND INTERNATIONALLY. AS FAR AS WE ARE CONCERNED, IT IS CLEAR CUT: OUR INVESTMENTS IN EVER BETTER, MORE SUSTAINABLE SYSTEMS AND PROCESSES AS WELL AS OUR SUSTAINABILITY REQUIREMENTS FOR SUPPLIERS CREATE AN INCREASINGLY COMFORTABLE WORKING ENVIRONMENT FOR OUR EMPLOYEES AND PROTECT OUR RESOURCES. THIS IS OFTEN COUPLED WITH ENORMOUS SAVINGS IN RAW MATERIALS.’

PRODUCTION



Production

To protect our resources, the climate and people, we systematically and proactively optimise sustainability in the production processes and in the supply chain of the entire TROX GROUP.

Thanks to continuous system and process optimisation in our 20 production facilities worldwide, we are moving closer and closer to our goal of climate neutrality. On this path, we believe that each individual step is simply a small part of a larger whole that will transform our production of today into a model for the future. For us, reducing the consumption of energy and resources to a minimum is just as important as creating a pleasant and safe working environment and this includes creating a supply chain in which everyone involved is responsible for the implementation of sustainable processes and human rights. To facilitate this, TROX has systematically laid the foundations to make our production sustainable and future-proof.

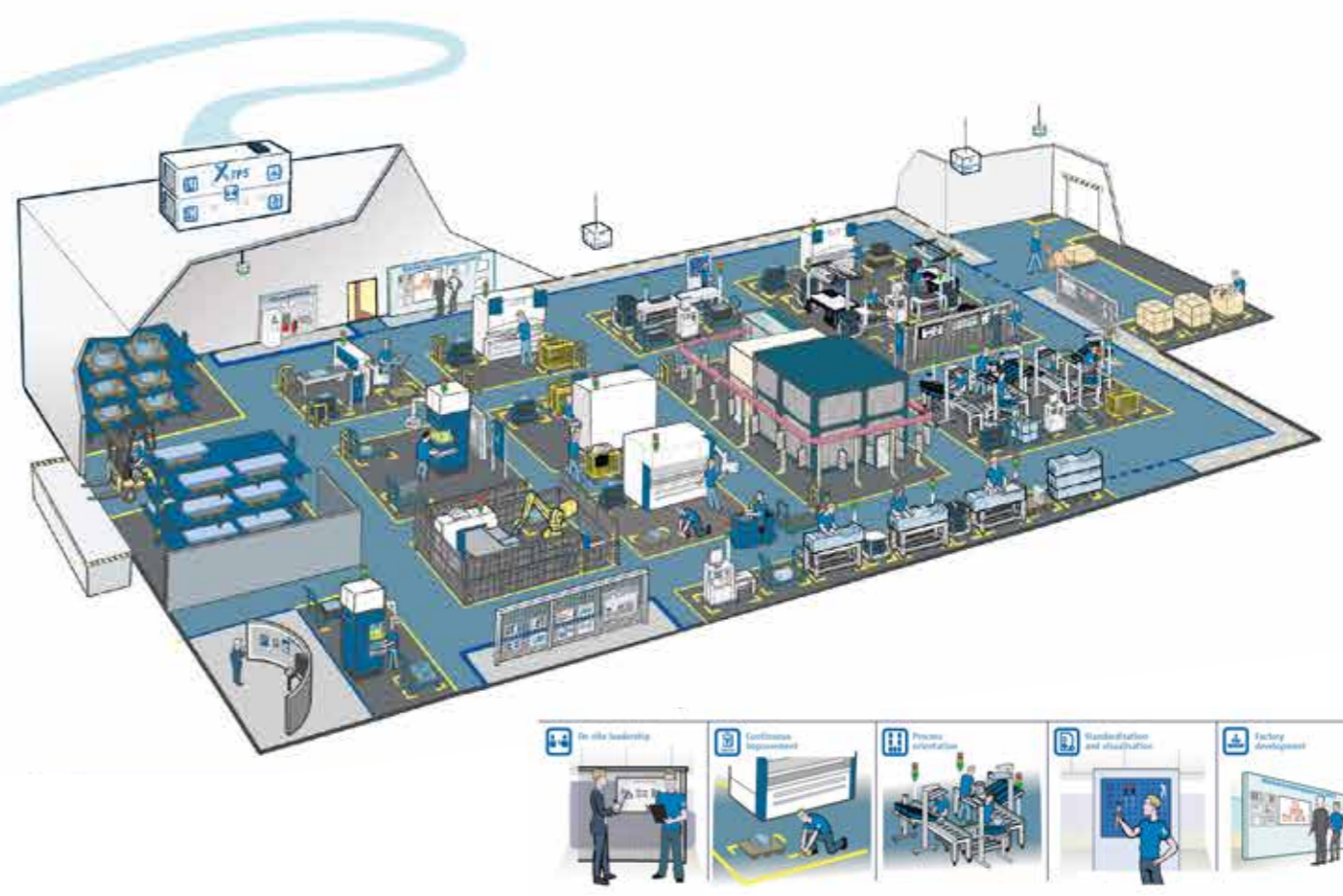
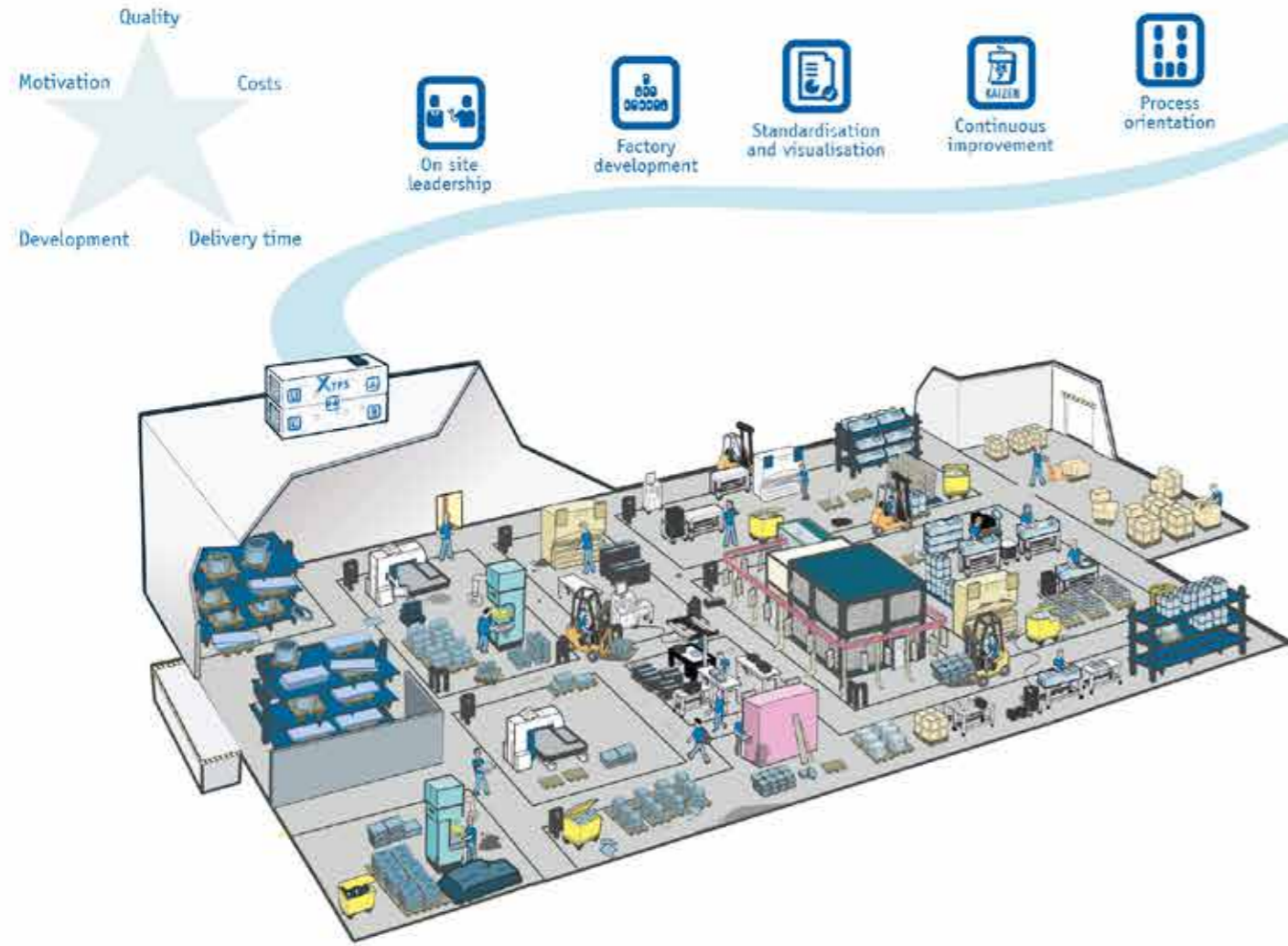
Sustainability in the production plants of TROX GmbH: carefully planned and effective.

Quality, energy and environmental management as well as work and health management are all bundled in the integrated management system of TROX GmbH. All departments define concrete plans of action and measures and these are accompanied by internal system and process audits. In this way, the sustainability of our production processes is constantly and systematically improved.

A central component of our sustainability measures in production is the saving of resources. In a world where resources are becoming increasingly scarce, we don't want to waste anything. This is why we rely on production processes and machine technologies that use the material we need to manufacture our products in a manner that offers the equivalent level of ecological benefits as economical ones. Our constant search for new, even more sustainable methods, combined with investments in the most advanced machine technology, plays a significant role in leading our company into a secure future and to conserving the world's resources.

**SAVING RESOURCES
IS ONE OF OUR
MAIN CONCERNS.**





comprehensive design stage that takes all options into account so that we can find the best solution. In 2021, for example, we completed the design of a new spigot production system for the Neukirchen-Vluyn plant, and this is scheduled to be implemented in 2022. This modernisation step will help us to achieve a 35% improvement in material utilisation, because the new spigot manufacturing equipment almost halves the consumption of semi-finished products and reduces waste by an extraordinary 96%. In the future, we will thus save 53.5 tonnes of material on an annual basis in our spigot production.

Material savings in spigot production per year

	Spigot production old	Spigot production new
Consumption of semi-finished products	110 t	56.5 t
Waste	70 t	2.5 t
Usable material	40 t	54.0 t
= material savings of 52% (53.5 t)		

To ensure the sustainability measures in our production are effective, our environmental indicators are recorded with ever greater precision and detail. In 2021, the analysis of disposal costs at the Anholt plant led to further promising starting points for conserving resources and thus saving CO₂. The listing and quantifying of the types and quantities of waste resulted in a project with high sustainability potential: to reduce the large quantities of sheet metal scrap to be disposed of, in 2021 we examined the possibility of using a machine that uses this sheet metal scrap to produce our required sheet metal blanks. Taking into account the specified daily quantities, the system will produce the sheet metal blanks with little waste and thus directly support us in avoiding steel scrap.

In addition to the benefit of resource protection and CO₂ reduction, our investments in state-of-the-art machine technology also pay off for the people who work in our production. Because every step we take focuses on the well-being of our employees and their safety.

The TROX Production System (TPS) increases sustainability in the production facilities of the entire TROX GROUP.

The purpose of our TROX Production System is to make today's production sustainable and future-proof for the entire TROX GROUP. This set of rules forms the basis of our optimisation activities and provides for a wide range of improvement tools that can be used depending on the respective situation. In the 20 production facilities of the TROX GROUP, TPS helps to align structures and organisations that we utilise to continuously improve production processes and administrative procedures and to promote the sustainable development of each individual production facility. An international TPS training session with TPS experts takes place once a year.

In addition to this, all improvements are recorded in the context of an annual audit, and further fields of action and measures are defined. Outstanding ideas and implementations are also documented in the TPS Best Practice Handbook. Regular video conferences allow for comprehensive exchange regarding the implementation and progress at the individual factories. At the heart of these collaboration efforts is the strength to pull together across borders, the goal being to achieve climate neutrality in TROX production sites all over the world.



TROX works determinedly to ensure greater sustainability in the supply chain.

To guarantee that TROX's ambitious sustainability goals are met in all respects, we actively involve our suppliers. We expect our suppliers to be as responsible as we are towards our partners. In other words, we expect them to take responsibility, act in accordance with our Code of Conduct and our sustainability standards and to apply these principles across the supply chain. It is important for us that this behaviour is ensured and promoted among both direct and indirect suppliers.

The TROX GROUP is a member of the Bundesverband Materialwirtschaft, Einkauf und Logistik e.V. (BME), the Federal Association of Materials Management, Purchasing and Logistics. We recognise our social responsibility as set out by the BME Code of Conduct. To this end, we are guided by the values of integrity and fairness in all procurement processes and expect the same from our suppliers. By accepting our **Code of Conduct for TROX Suppliers**, our suppliers worldwide undertake to respect human and children's rights, rule out discrimination of any kind, promote safety and health at work, but also comply with environmental laws and minimise processes that are harmful to the environment. These obligations also apply for any subcontractors of our suppliers.



In order to ensure even greater and more comprehensive compliance with our Code of Conduct and to be able to constantly monitor compliance, we launched a new tool in 2021: **IntegrityNext**, a sustainability platform for supplier assessments. Our goal is to use this tool to record, analyse and evaluate the sustainability development of 90% of our suppliers by 2025 and to initiate appropriate measures if necessary.

IntegrityNext provides us with a well-structured, globally applicable and easy-to-use platform. Starting in early 2022, questionnaires will be sent to all our suppliers and these will cover social, ecological and economic aspects of sustainability across all relevant topics. In the event of missing or negative answers, appropriate follow-up measures will be initiated. In addition, an analysis will be performed on millions of information sources that serve to provide a picture of the supplier and potentially an early warning of possible sustainability deficiencies or failures.

With the new tool, we can ensure that risk areas such as child labour, environmental toxins, etc. are recorded and the resulting preventive and remedial measures can be initiated. IntegrityNext is GRI-certified and can thus ensure correct application of the content of the GRI standards.

After the introduction of the new supply chain law, we set out to find a tool that would provide us with comprehensive information and support. With the implementation of IntegrityNext, we are conscientiously fulfilling our duty of care towards our suppliers. Because if we want to become credibly climate-neutral, then all links in the value chain must be sustainable.

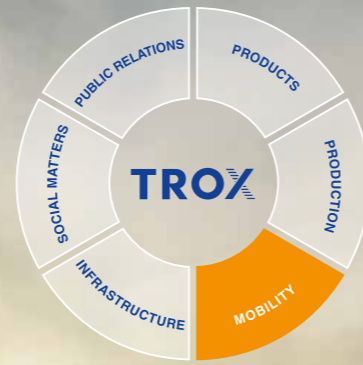
Our sustainability concept here builds on long-term partnerships. We want to look for solutions together and thus create greater stability – for us and for our suppliers. With IntegrityNext, we and our stakeholders will have the highest level of transparency and security in relation to human rights and environmental behaviour throughout our supply chain.



Oliver Casper
Member of the extended Board of Management of TROX GmbH
Head of Purchasing

'TODAY, WHEN WE THINK OF SUSTAINABLE MOBILITY, WE ALL THINK IMMEDIATELY OF ELECTRIC VEHICLES. TROX IS ABOUT MUCH MORE THAN THAT. WE ALSO THINK ABOUT FACTORS SUCH AS SHORT DISTANCES FROM THE PRODUCTION SITE TO THE CUSTOMER, ABOUT TRANSPORT PACKAGING THAT DOES NOT END UP IN THE RUBBISH BIN HAVING ONLY BEEN USED ONCE, AND ABOUT LOGISTICS CONCEPTS THAT BUNDLE SUPPLY CHAINS AND REDUCE TRANSPORT COSTS.'

MOBILITY AND LOGISTICS



Mobility and logistics

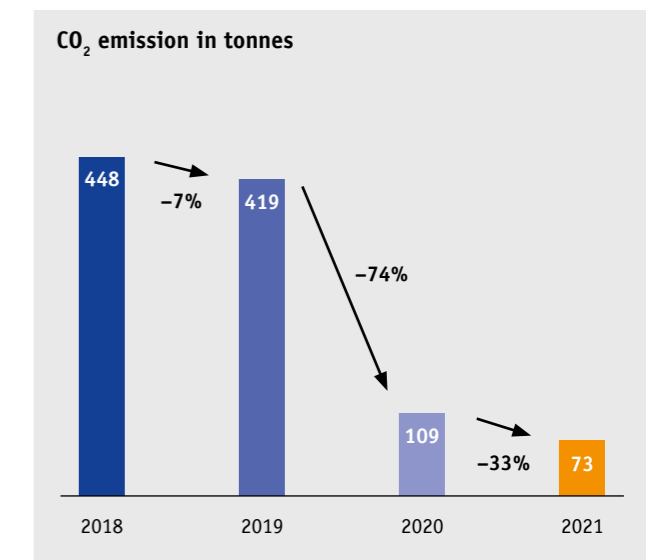
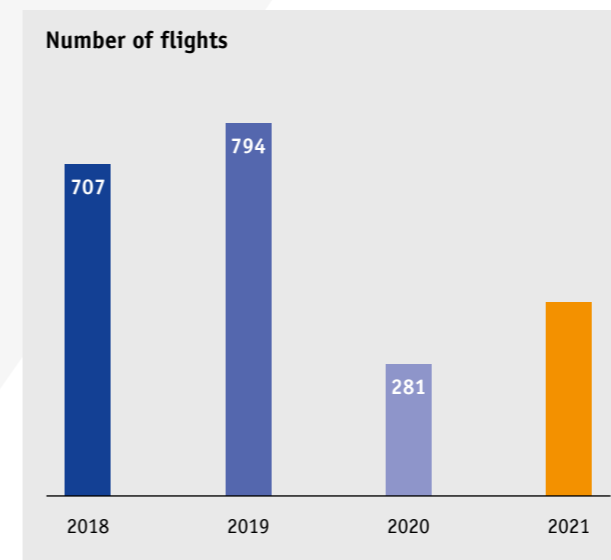
In the 'Mobility and logistics' field of action, we focus on reducing CO₂ in travel and in logistics and try to prevent increasing amounts of packaging waste.

The extent to which the topic of sustainability has become anchored in the thinking and actions of our company can also be seen in the efforts of our employees to travel more sustainably and to develop sustainable logistics strategies. It is also something that is reflected in the sophisticated ideas for resource-saving packaging concepts.

Our air travel behaviour has changed.

Our experience of the coronavirus pandemic in 2020 paved the way for a new way of thinking at TROX. Now, the first question we ask ourselves when it comes to the matter of business trips is whether the trip is necessary at all. We have seen first-hand the amount of CO₂ that can be saved by utilising digital meetings instead of face-to-face meetings wherever possible. The well-developed level of digitisation at TROX has played a major role in maintaining proximity to our customers, business partners and employees. In 2021, we used planes for travel a little more often than in the previous year, but with 33% less CO₂ emissions. We did this by avoiding long-haul flights where possible and consequently flying significantly fewer kilometres. Compared to 2018, we were even able to reduce the CO₂ load generated by flights by a full 84%. In this way, too, we are playing our part in protecting the climate despite the increasing contact rate.

Flights and CO₂ emissions of TROX GmbH





In addition, we increasingly use the train.

Whether from Duisburg to Berlin, from Kassel to Frankfurt or from Ismaning to Moers – in 2021, employees of TROX GmbH travelled a total of 43,004 km by train on a wide variety of regional and long-distance routes. This has replaced many car trips and some flights in a climate-friendly manner.

The balance of our rail usage:

A consumption equivalent to only 602 litres of petrol and 0 kg of CO₂. Travelling the same distance by car would have consumed 3,136 litres of PEC and emitted 6,876 kg of CO₂ into the atmosphere. We intend to continue to make greater use of this climate-friendly option of rail travel for our business trips.

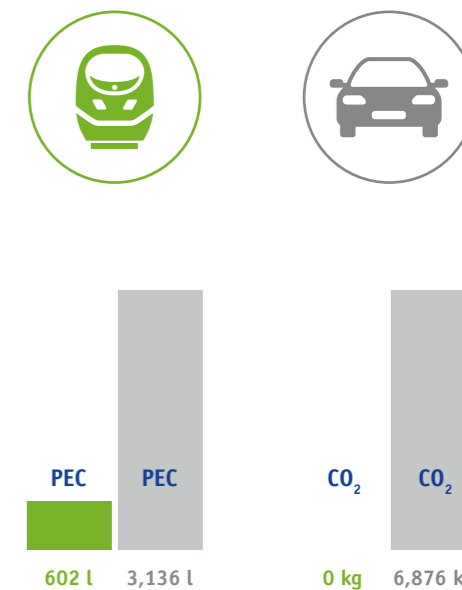
OUR BUSINESS TRIPS ARE INCREASINGLY BEING PLANNED IN A CLIMATE-FRIENDLY MANNER

The expansion of our electric fleet picks up speed.

To reduce our carbon footprint in situations where a business trip by car is necessary, something which is now given careful consideration, we are increasingly using hybrid and electric models.

In 2021, a total of five climate-friendly vehicles were purchased in Neukirchen-Vluyn: three with hybrid and two with fully electric drives. Two fully electric variants were added in Anholt. We will continue to gradually implement this changeover from petrol/diesel to hybrid/fully electric. Because every step counts on our journey to climate neutrality.

CO₂ savings of TROX GmbH in a comparison of train and car



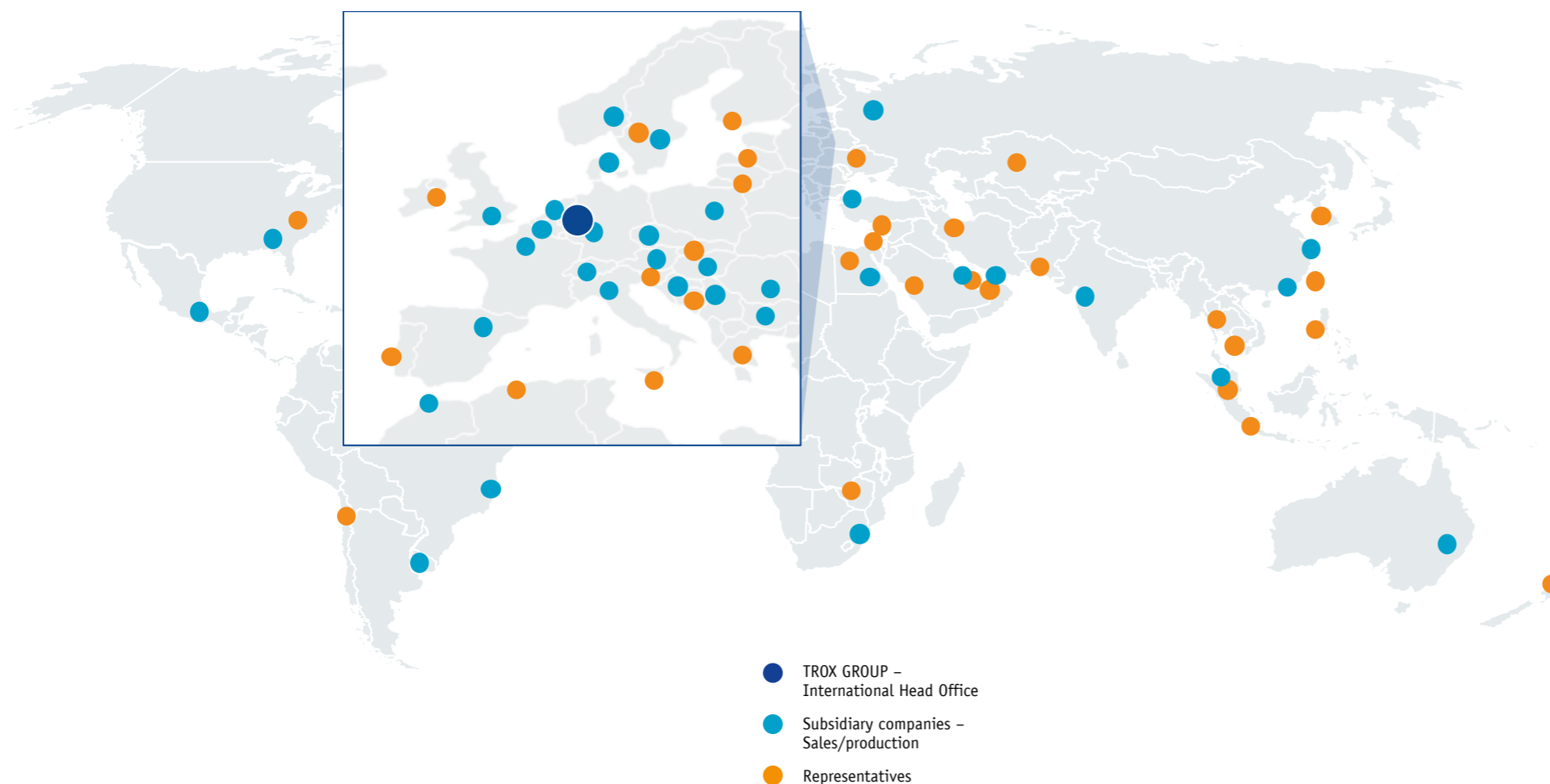
Assuming that train journeys and car journeys are identical. DB Vertrieb GmbH, bahn.business

Environmental data at a glance January to December 2021 TROX GmbH

	InterCityExpress	InterCity/EuroCity	Local transport	Total
Percentage	91.0%	7.0%	6.9%	100%
Pkm (km) Passenger kilometres	39,143	875	2,986	43,004
FEC (kWh) Final energy consumption – fuel, petrol, electricity	1,879	40	293	2,212
Primary energy consumption (equivalent to petrol in litres) – incl. production, transport, conversion	514	13	75	602
CO ₂ (kg)	0	0	0	0

No BahnCard(s) 100 were taken into account for the environmental indicators. DB Vertrieb GmbH, bahn.business





With 20 production sites worldwide, we can get to the customer quickly.

TROX pursues a decentralisation strategy. We increased the number of our production sites once again in 2021 – to the current number of 20. We don't want to produce everything everywhere, nor do we want to produce something different in every production site. Instead, we are focussing on where something is in demand and where it is needed. This enables us to produce and deliver in close proximity to our customers, ensuring short delivery times and short distances to the customer – with correspondingly low CO₂ emissions.

We are also striving to further amplify this by planning transport based on the bundling principle: by delivering to specific regions and thereby shortening delivery times and distances, we also reduce CO₂ emissions.

Our logistics strategy: global and holistic.

Logistics at TROX follows a holistic approach in a wide range of subject areas. It involves the constant monitoring of interfaces to ensure smooth processes as well as precisely observing, recording and, if necessary, optimising the flow of materials and information.

As part of the sustainable, high-performance and inherently stable logistics system of our TROX GROUP, we naturally think globally. This is why we support our subsidiaries constructively and comprehensively in the design and implementation of concepts that address individual concerns and at the same time ensure perfect networking.

We support our subsidiaries around the world in all logistical matters:

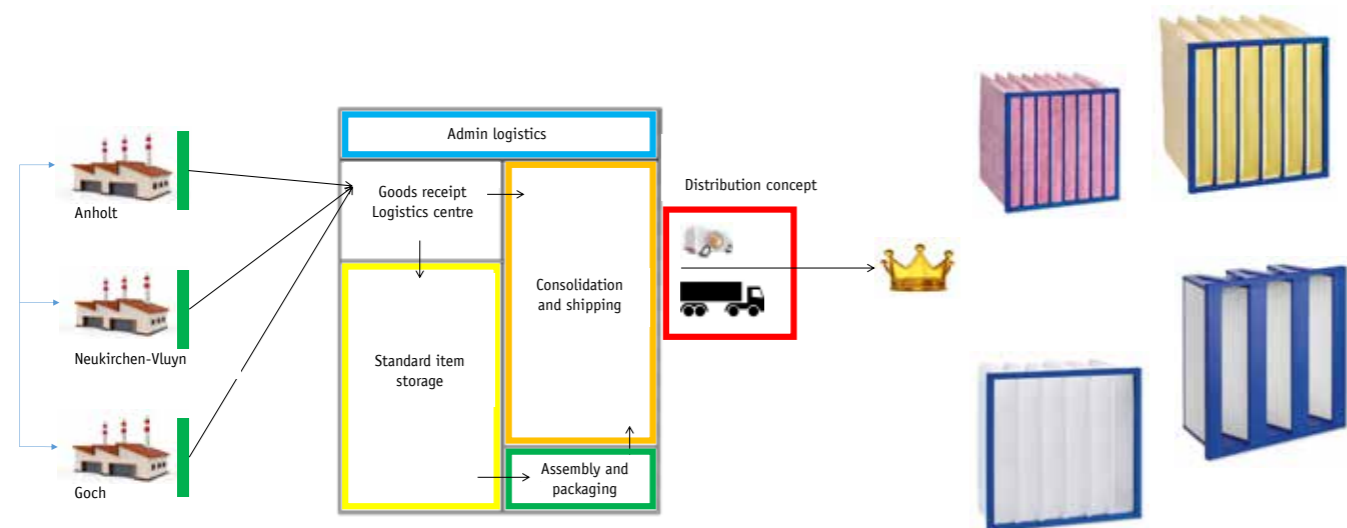
- Development of tailor-made solutions, which we provide as best practice examples, e.g. the concepts of finished goods and semi-finished goods storage that have already been implemented in practice, as well as shipping and customs organisation or shipping processes
- Advice on strategic logistics development – e.g. in feasibility studies for new logistics services such as driverless transport systems
- Accompaniment of new building strategies from the beginning
- Development of group-wide standards and mapping of all logistical processes in the corporate model with all subsidiaries – with the view that everyone should work in one system
- Optimisation of the key logistical figures – to monitor the logistics services of the TROX GROUP and to optimise them on the basis of a well-developed database

Our logistics concepts are constantly being optimised. Each individual company benefits from the experiences and successes of the collective whole. We believe that this is an opportunity to remain future-proof and competitive while promoting TROX's sustainability development.

We pursue this holistic approach in all areas relevant to logistics:

	Explanation
Inbound logistics	› Imports to TROX
Outbound logistics	› From the production facility to the customer
Customs matters	› Supplier declaration, sanctions list check, export control, powers of attorney, permits and much more
Any kind of transport	› Road, water, rail, air
Company-internal	› Logistics strategy
Storage logistics	› Finished goods warehouse, etc.

Logistics concept for the new finished goods warehouse



We are developing more and more reusable packaging.

In order to protect our resources, we like to think in new ways when it comes to packaging. What can be improved, what is even possible and what can be saved?

With the shuttle containers, we have once again succeeded in developing reusable packaging that ensures environmentally friendly transport and significantly reduces the typical consumption of packaging material.

At the Neukirchen-Vluyn production facility the containers are loaded with the frames produced there for our filters and transported to our logistics service provider BTG. From there, it is on to our filter production company KS Filter, where the containers are emptied and collapsed for transport back to the Neukirchen-Vluyn production facility. This reduction in volume means that more containers fit in a truck, which reduces CO₂ emissions. And by reusing the shuttle containers, we need significantly less packaging material. It is an environmentally- and climate-friendly development that will certainly not be our last.

The filter logistics pilot project – faster delivery and less packaging.

In collaboration with a service provider that is also actively pursuing sustainability goals, we have implemented a pilot filter logistics project and established a finished goods warehouse to help streamline production, stabilise delivery times for customer-specific orders, increase customer satisfaction and thus strengthen the company.

1,000 storage spaces for approx. 80 stock items as well as additional consolidation areas for further packages from the filter area ensure that we can increase the number of products with very quick availability from stock and thus influence production smoothing in manufacturing. As a result, we will be able to calculate our delivery times much better, which our customers will certainly appreciate.

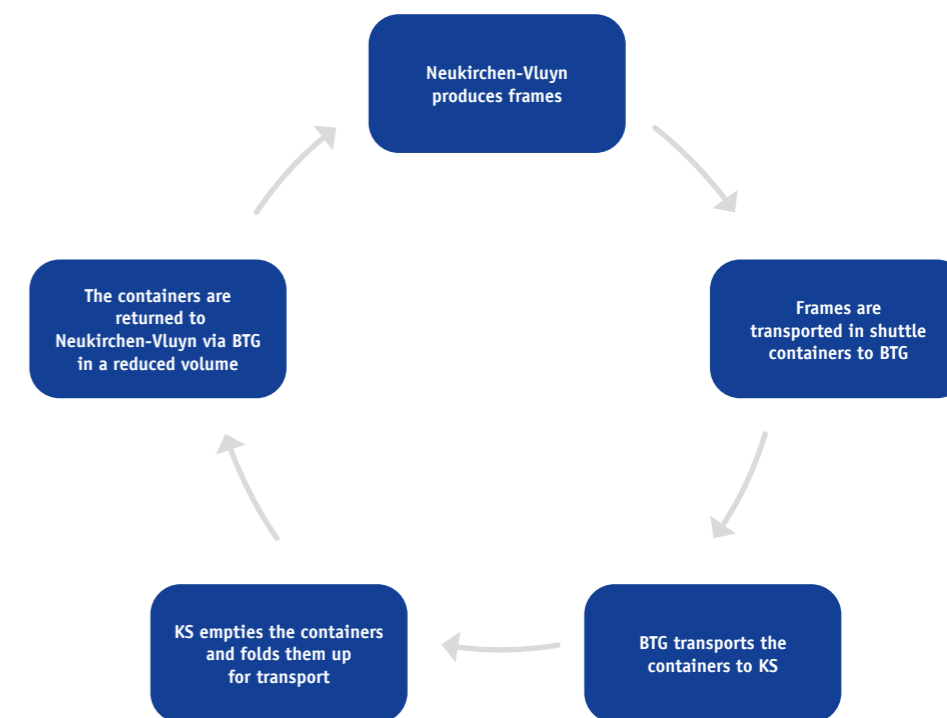
Within the project, the packaging of filters has been optimised on the basis of the packaging data collected.

The result: volume-reduced packaging standardised according to packaging regulations and a reduction in the number of boxes required to a total of four. In addition, the number of filters of each size that will fit in which box is precisely defined for each stock item. A table clearly shows which item is packed in which box, with the box being used both as product and shipping packaging. Plastic packaging is only used where it is absolutely necessary. Filling material can be dispensed with entirely.

For transport, our service provider uses trucks in accordance with the Euro 6 standard, and pays strict attention to ensuring optimal utilisation.

All in all, it is a project with great potential for saving CO₂ and conserving resources, and this has a positive effect on our company and the environment day after day.

Transport cycle of the new shuttle containers





Paul Schwarz
Head of Construction/Safety

'WITH THE EXPANSION OF DATA COLLECTION AT TROX, CONSUMPTION, EMISSIONS AND CONNECTIONS HAVE BECOME MORE TANGIBLE FOR US. WHETHER WE ARE REFERRING TO PRIMARY ENERGY CONSUMPTION, CO₂ EMISSIONS OR WASTE QUANTITIES: OUR DOCUMENTATION CLEARLY SHOWS WHERE WE STAND, THE AREAS WE STILL NEED TO OPTIMISE AND HOW SUCCESSFUL WE ALREADY ARE WITH RESPECT TO THIS PROCESS – AND ULTIMATELY THE BEST WAY OF FURTHER INCREASING SUSTAINABILITY. THIS IS THE APPROACH WE ARE TAKING AND WE ARE DOING IT IN A TARGETED AND CORRESPONDINGLY EFFECTIVE MANNER.'

INFRASTRUCTURE



Infrastructure

The path to becoming a climate-neutral TROX GROUP inevitably leads to ecologically effective innovations in the field of infrastructure. From the general choice of energy source, to ensuring a healthy fabric for the building, energy and water consumption, resource-saving waste management and sustainable digitisation concepts.

The progress that we are making thanks to the consistent implementation of our sustainability strategy cannot be underestimated: with increasing sales and thus production volume, our CO₂ emissions are falling. In order to be able to measure this development with ever greater precision, we are continuing to expand both the quality and the scope of our monitoring with data collection and evaluation. We may still have to estimate or derive some CO₂ conversion factors at the moment, but the data so far speaks for itself and is confirmed by our falling operating costs.

The internal environmental balance of TROX GmbH shows very clearly that our sustainability measures are paying off. Despite the increase in amounts invoiced, the absolute CO₂ emissions have been maintained at a constant level since 2015 and were significantly reduced in 2021 due to the switch to 100% green electricity. Since 2015, CO₂ emissions have fallen by 44% for every EUR 1 million invoiced.

The TROX GROUP shows a similar picture. With a similarly high increase in amounts invoiced, the absolute CO₂ emissions have been maintained at a constant level. Since 2015, we have achieved an 18% reduction in CO₂ emissions for every EUR 1 million invoiced. This is significant progress on our path towards climate neutrality; it is highly motivating and it inspires us to continue on our journey.

CO₂ emissions of TROX GmbH

TROX GmbH	2015	2016	2017	2018	2019	2020	2021
CO ₂ emissions (t)	6,514	6,625	6,769	6,719	6,645	6,958	4,952
CO ₂ emissions (t)/per million euros invoiced	29.0	28.6	29.1	26.4	24.0	25.7	16.2
Change (%)						-11.2	-44.2

CO₂ emissions of the TROX GROUP

TROX GROUP	2015	2016	2017	2018	2019	2020	2021
CO ₂ emissions (t)	16,099	16,180	15,815	16,257	15,879	16,394	16,454
CO ₂ emissions (t)/per million euros invoiced	33.1	34.3	32.4	32.1	29.3	31.2	27.1
Change (%)						-5.7	-18

Amounts invoiced only include net proceeds from production and goods trading.

Legend: Between 2015 and 2021, TROX GmbH reduced its CO₂ emissions by 44.2% from 29 tonnes to 16.2 tonnes per 1 million euros invoiced.



Increasing energy and CO₂ savings thanks to geothermal heat pumps and refrigeration systems.

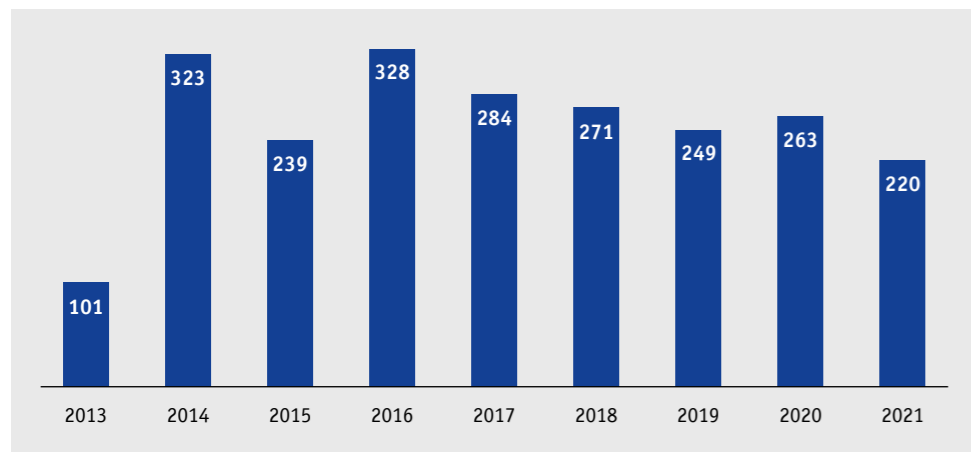
With the geothermal heat pump systems at our Neukirchen-Vluyn and Anholt locations, we have succeeded in reducing our CO₂ emissions by quite a bit year after year (compared to conventional heat and cold generation using a natural gas boiler and refrigeration system). In the 2021 operating year, the primary energy savings in Neukirchen-Vluyn came to 220,000 kWh (220 MWh) and thus 43 tonnes of CO₂.

Since our monitoring process commenced in mid-2013, we have saved a total of 2,278,000 kWh of primary energy and 439 tonnes of CO₂ there thanks to our geothermal heat pump system.

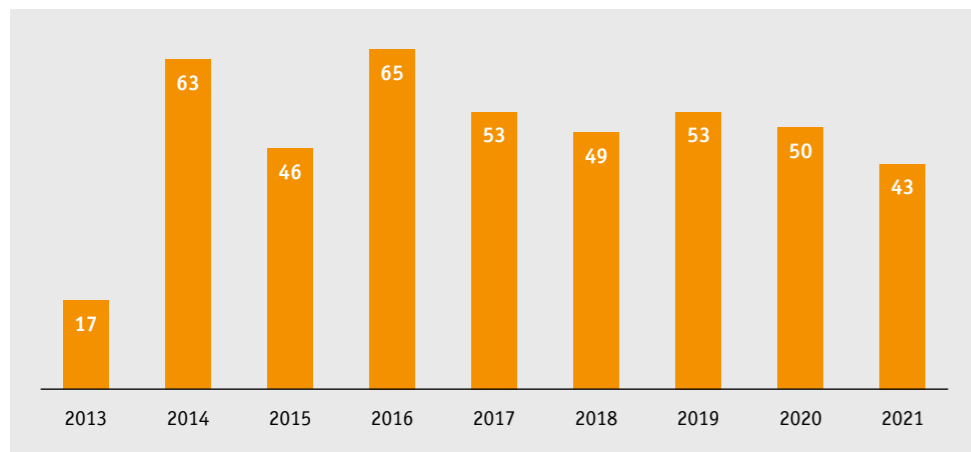
Since March 2017, the geothermal heat pump system in Neukirchen-Vluyn has been monitored via the central building management system. Here all parameters of the actual system operation are recorded and possible power reserves are identified. This is part of our energy management system in accordance with DIN EN ISO 50001:2018, which we introduced in 2016 as part of the integrated management system based on the previous standard.



Primary energy savings (MWh/yr) Neukirchen-Vluyn



CO₂ reduction (t/yr) Neukirchen-Vluyn



An evaluation of the data recorded by the geothermal heat pump system in our Anholt production facility revealed considerable optimisation potential.

2021 subsequently saw the completion of the design work that had already begun and commencement of the conversion measures. Our heat pump system in the AHU hall in the Anholt production facility will also supply Hall 2 with heat and cooling in the future. And to meet the constant increase in the required cooling capacity, the system has been expanded to include an additional refrigeration system.

Conversion and expansion will help us to use this system even more energy-efficiently.

Due to delays in delivery and the installation of the additional refrigeration system, completion has been postponed. With an investment volume of €500,000, the upgrade project is set to be completed in 2022.

After this system optimisation, our primary energy consumption at the Anholt production facility will be reduced even further. In the period from 2014 to 2021, we achieved primary energy savings of 838,000 kWh (838 MWh) and a CO₂ reduction of 200 tonnes.

As part of the conversion measures, we will also add a central building management system to the entire system in the Anholt production facility, which will simplify both operational management and monitoring processes. In this way, we are significantly raising the bar in terms of our data collection and analysis methodologies for CO₂ reduction and it means that we will be ready for the future.



TROX LOOKS INCREASINGLY TO GREEN ENERGY

Also planned: green energy from a photovoltaic system for the Anholt production facility and TROX X-FANS GmbH.
 In order to achieve our goal of climate neutrality, we are increasingly using forms of energy that are naturally renewable and/or available in unlimited quantities. This includes solar energy.

For both our TROX production facility in Anholt and our subsidiary TROX X-FANS in Bad Hersfeld, we thus planned to instal a photovoltaic system in 2021. Depending on the availability of the components, this is now set to be implemented in 2022.

Even better than expected – TROX Auranor.
 Although the newly built TROX production facility in Norway, which went into operation in 2021, has not yet had a full year of production, the factory may well achieve energy savings of up to 30% per year compared to the old factory.

One of the primary drivers of these savings is the building management system in place there, which monitors energy consumption and adjusts it to an optimal level. This ensures that energy savings will continue to increase in the coming years.

The LED lighting throughout the building also contributes to the high level of energy savings. At the same time, the working environment has improved significantly for employees in terms of light, ventilation and temperature.

On 1 September 2021, TROX Auranor received the Eco Lighthouse certification for the new building and its processes. This is Norway's leading certification system for companies that seek to document their environmental efforts and demonstrate their social responsibility. Thanks to this certificate, TROX Auranor has access to specific tools for implementing further effective and profitable environmental improvements in areas such as the work environment, waste management, energy consumption, purchasing and transport. Relevant issues such as food waste and plastic are also included. This puts our Norwegian production facility in an even better position to incorporate sustainability into its corporate strategy and day-to-day operations.

This successful development will be continued. The aim is to keep the CO₂ footprint as low as possible and to ultimately be carbon neutral across the entire value chain.





Further international sustainability measures to reduce primary energy and CO₂.

In 2021, the following steps were taken in addition to the energy-efficient roof renovation of TROX UK and the factory commissioning at TROX Auranor:

TROX South Africa

Supplementation of the powder coating equipment to include a heat recovery system, the aim being to replace the existing electrical heating system in the treatment process in a climate-friendly manner using the recovered energy.

TROX Spain

Heat recovery system for the production plant. In the planning stage.

TROX Norway

Development of reusable product packaging for active chilled beams.

TROX Switzerland

New construction of the production plant with the aim of achieving almost full climate-neutral production like TROX Auranor. Employing a particularly sustainable, CO₂-binding construction method using renewable wood. In the planning stage.

FOR US, CLIMATE PROTECTION IS ONLY ACHIEVABLE ON A GLOBAL BASIS



We keep our focus on our energy and water consumption.

Increasing sales figures inevitably lead to higher energy and water requirements.

Overall, we have discovered that the water consumption of the TROX GROUP has increased by 33%. Our consumption of electricity, gas and oil has increased by 18% – with a slight increase in CO₂ emissions of just 0.4%. The changeover at TROX GmbH and some of our subsidiaries to 100% green electricity is already having an impact here.

In relation to our total sales, an even more positive picture is emerging in terms of our electricity, gas and oil consumption: CO₂ emissions in tonnes per million euros invoiced were 31.2 tonnes in 2020 and this figure fell to 27.1 tonnes in 2021.

So that we can continue to find the right starting points for improvements, our measurement network is becoming more and more sophisticated and larger in scope.

CO₂ reduction 2020 – 2021 per million euros invoiced

TROX GROUP	2020	2021
CO ₂ emissions (t) from electricity, gas and oil consumption	16,394	16,454
CO ₂ emissions (t) per million euros invoiced	31.2	27.1

Amounts invoiced only include net proceeds from production and goods trading.

Our waste management system is continually improving.

Our path with respect to our handling of waste is clear: we are moving away from the linear waste of resources and towards the circular raw material economy. By avoiding waste and implementing measures such as recycling, reutilisation, processing and responsible disposal, we are helping to protect the world's resources and returning raw materials and energy to the economic cycle.

In the metal sector (steel, stainless steel, aluminium), for example, the material utilisation rate of TROX GmbH in 2021 was 78%. We recycled the remaining 22% that could no longer be used.

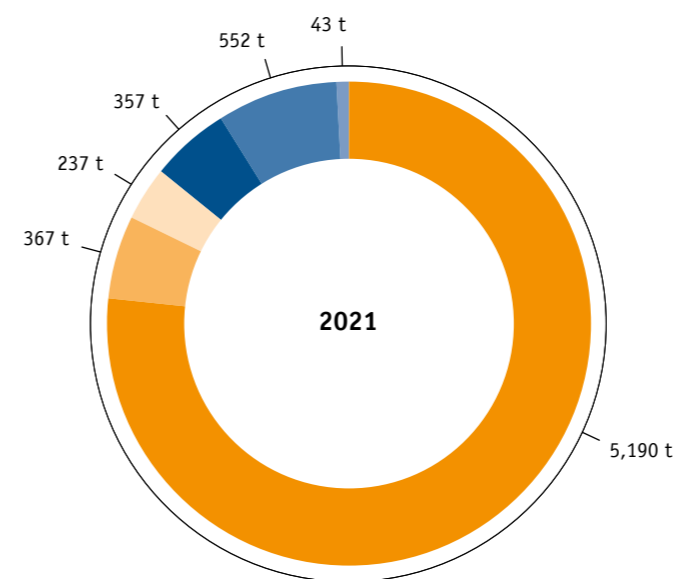
Wood disposal at the Anholt production facility has been carried out via an external biomass heating plant since 2021. Thanks to the processing of the wood into wood chips, a CO₂-neutral fuel, its combustion generates energy that is fed into the general supply network – an environmentally responsible alternative to conventional energy sources such as oil, gas and coal.

And the falling consumption of printing paper at the Neukirchen-Vluyn location from 13,535 boxes in 2020 to 12,567 boxes in 2021 also shows the commitment and the conscientiousness of our employees when it comes to implementing the topic of sustainability in their day-to-day work.

Examples like these show that we are on the right track.

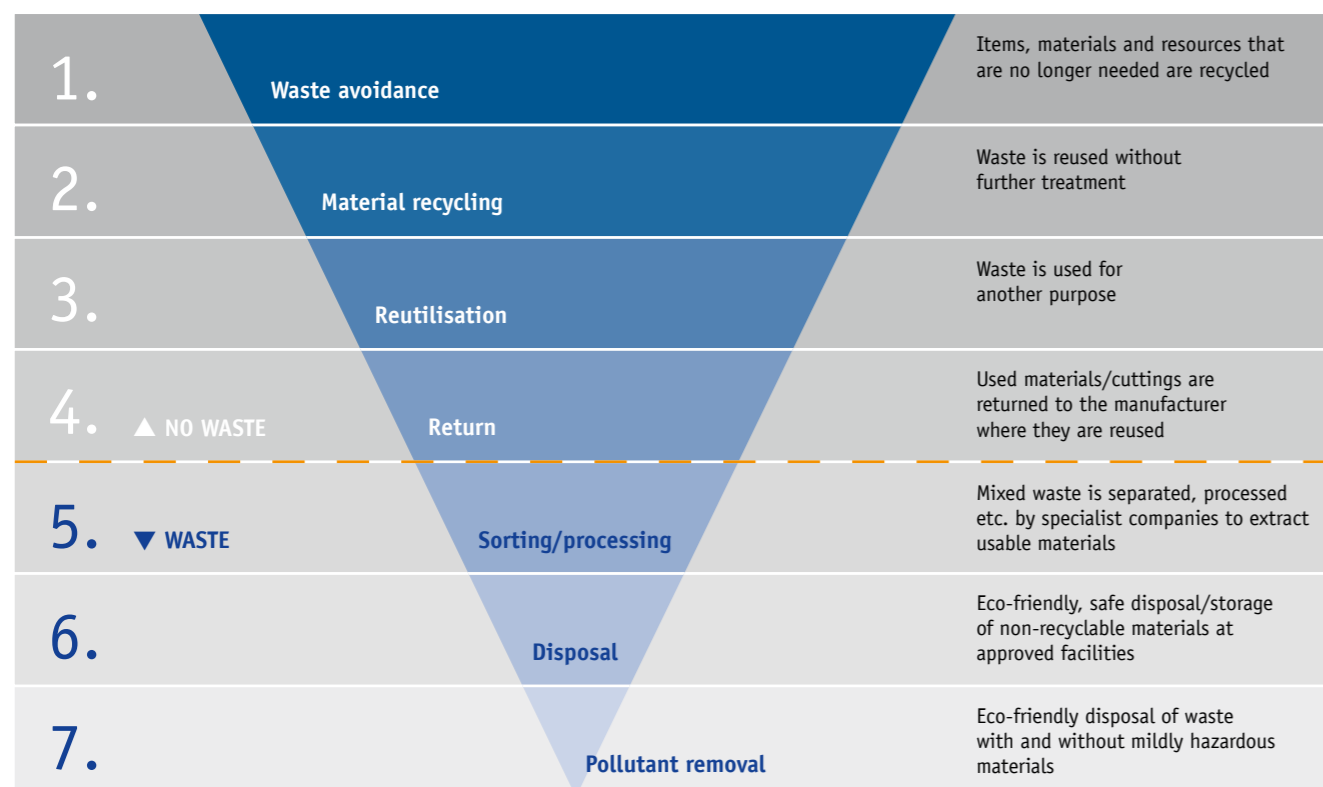


Waste generated by TROX GmbH



	2020 in tonnes	2021 in tonnes	Target for 2025
1 Waste avoidance	not recorded	not recorded	
2 Material recycling	3,385	5,190	
3 Reutilisation	1,292	367	
4 Return	223	237	
Recycling rate 2-4	83%	86%	90%
5 Sorting/processing	327	357	
6 Disposal	660	552	
7 Pollutant removal	37	43	
Disposal rate 5-7	17%	14%	< 10%

The TROX waste hierarchy



Our goal is to increase the recycling rate to 90% by 2025 and reduce the disposal rate to less than 10%.

OUR IDEAL IS THE CIRCULAR ECONOMY OF RAW MATERIALS

We strive to capture waste flows unmixed as they arise and to return them to the material flow cycle. Waste is separated and collected within the working groups of TROX GmbH. It is then transported to central collection points by the logistics division, and stored in corresponding transport containers for the different types of waste. Owing to varying arrangements in different countries, it is currently not possible to record the total amount of waste generated by the TROX GROUP. We want to change this. That is why we will introduce a globally standardised waste management system at all locations by 2025.

Our digitisation status makes us fit for the future.

From the outset, TROX believed the megatrend of digitisation presented an opportunity to strengthen customer loyalty, simplify processes and increase the efficiency of our ventilation, air conditioning and fire and smoke protection systems to the highest possible level. The solid development of the TROX GROUP is thus also based on the continuity and creativity with which we have utilised and expanded the possibilities of digital data exchange.

In 2021, for instance, we once again took some major steps towards process standardisation while simultaneously expanding the digitisation of communication and cooperation.

The **TROX web shop** was further expanded and also went live at our subsidiaries in Austria, Spain, Norway, Denmark and the Netherlands. And this was implemented with a significantly expanded range of functions, which makes the sale of spare parts much more customer-friendly and efficient and provides customers and operators of TROX products with product-specific information via a QR code.



In 2021, Version 1 of a **new corporate model** was also accepted on the current ERP version of Infor LN. It will be used at TROX HESCO in Switzerland in 2022. The single logistics solution being implemented here will offer significant advantages for the supply chain of the entire TROX GROUP over the coming years. Also of central importance in this area was the selection in 2021 of a suitable, globally applicable MES software. In the medium term, it will become an integral part of TROX's production control and a milestone towards the implementation of Factory 4.0.

To ensure better planning and transparency within our supply chain, process improvements were carried out in the area of Product Lifecycle Management (PLM) and extensive reporting channels were created.

In addition to Microsoft Teams, which quickly became established as a means of facilitating day-to-day activities at TROX, other tools for digital collaboration were also introduced, namely **Whiteboard and MS Planner**.

With all the advances in digitisation within the TROX GROUP, we place great emphasis on security. In light of the increasing threat of cyber attacks, existing solutions have been continuously improved and numerous new security projects have either been initiated or are planned for 2022. In this way we are protecting our company while also offering our customers and business partners a secure environment for their data.

For us, digitisation is one of the most exciting topics of our time. Finding solutions that enable completely new processes and services, increase the transparency of our company, improve our sustainability and ensure healthy cooperation is a challenge that we are happy to accept.

With the online shop and our **myTROX customer portal**, our customers receive comprehensive support including all product and order information. It takes place digitally and thus without unnecessary on-site appointments with our technical experts. In addition, myTROX enables digital system monitoring with efficiency monitoring, evaluation, control and maintenance via remote access on a 24/7 basis. Our customers are granted access to cloud-based solutions in the context of these remote monitoring services. Here, too, we already have a new project in the pipeline for 2022, the TROX Cloud, which will offer even more customer benefits.

Another area of digitisation is picking up speed: with an increasing number of **self-created software solutions**, one of the areas we are investing in is the further development of our systems with enormous future potential.

A key priority of our digitisation development in 2021 was the preparation of a **web-based application** for the visualisation and generation of BIM models for components and air handling units configured online. Taking the example of a school in Neukirchen-Vluyn, at the Indoor-Air trade fair we gave an outline of the format digital planning could take in the future along with recommended approaches to ensure it can be used easily and safely in the early design stages.

Another interesting development from TROX is the **portable 3D scanner**, which significantly simplifies the design of ventilation solutions in existing buildings. Its use is particularly beneficial for projects on older buildings and where the current structural situation has not been adequately documented. This is because architects, structural engineers and process planners can be provided with precise BIM data using a 3D scan. The exact, three-dimensional representation of the rooms enables ventilation solutions to be tailored to each individual room and designed in a cost-optimised manner in accordance with the specifications of the FGK Status Report 52 and the VDMA.

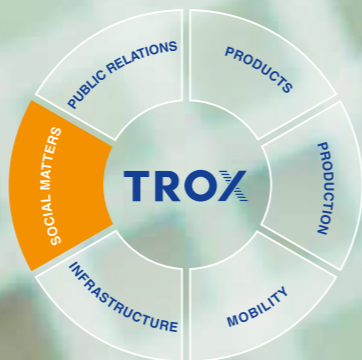




Thomas Mosbacher
Member of the Board of Management of TROX GmbH

'FOR US AS A GLOBALLY OPERATING GROUP AND EMPLOYER OF SEVERAL THOUSAND PEOPLE, THE POTENTIAL OF PEOPLE NOT ONLY INCORPORATES DIVERSITY, INVENTIVENESS AND COMMITMENT, BUT ALSO PERSONALITY, CARING, FAIRNESS, WELL-BEING AND SAFETY. TROX'S SUCCESS REFLECTS THIS PERFECTLY. BECAUSE OUR EMPLOYEES ARE TROX.'

SOCIAL MATTERS



Social matters

Change starts with people. They turn words and thoughts into ideas and actions. They grow with the possibilities and they help to shape tomorrow. In this sense, we believe that our employees are the engine for the sustainability development of TROX in accordance with our mission statement 'The human being is the yardstick, and people's well-being is our goal'.

It is our job to create opportunities to achieve a healthy, happy and motivated sense of togetherness that drives this engine. This is why we promote the health and well-being of our employees just as resolutely as we strive to ensure fair, respectful interaction with one another and the inclusion of the entire supply chain in our promotion of lived values. Together we stand for a sustainable, fair world for everyone. It is a commitment that strengthens the competitiveness of the TROX GROUP while simultaneously making a clear statement of sustainability.

We fly the flag – with the values of TROX.

On 13 September 2021, a unique campaign of this kind took place for the employees of our TROX GROUP in all 29 countries: the 'TROX Values Day'. The campaign was the beginning of an international values initiative that clearly defines and presents the values practised by TROX both internally and externally.

Trust, safety, reliability, quality and sustainability – these values represent a group of companies that not only offers its customers and business partners all over the world outstanding, energy-efficient products, but also a strong, solid foundation that they can rely on. And they stand for employees who – with the support of these values – are happy to get involved, who are there for one another and who identify with TROX as an employer.

Our appreciation of our employees is something that cannot be overstated and the values being shown on the façade of the International Center for Fire Protection in Neukirchen-Vluyn was a clear example of this. The campaign motto 'With you we are TROX' makes it clear that the success of the TROX GROUP could never be achieved without our employees. They are trend-setters, they protect the climate, they are team players and they say things how they are, they are Lower Rhine residents, they are value workers who give their best every day and promote the values of TROX around the world.

In addition to the five values for the entire TROX GROUP, each individual TROX company has also come up with three additional, country- and company-specific values.

We will look at the results and any changes to our values campaign in special workshops around the world in 2022.

With you, we are
TROX

**OUR TROX VALUES
CAN BE RELIED ON
AROUND THE WORLD**





Our coronavirus care – with vaccinations from TROX GmbH.

To be able to continue to react quickly and flexibly to new circumstances in the ongoing coronavirus pandemic, the Corona task force that was set up in 2021 will continue with its work. In the weekly meetings, current infection situations at the locations, implementation of hygiene concepts and government infection control regulations were discussed. Employees were promptly informed about everything they needed to be aware of with respect to the current situation via the Corona ticker that was published every two weeks on the intranet. Furthermore, our subsidiaries were informed weekly about the number of infections at TROX. The maximum infection rate in the company was approx. 1%, but the typical rate was usually significantly lower.

The coronavirus vaccination campaign carried out at TROX GmbH played an important part in achieving this statistic. As part of the company health management campaign, the first vaccinations were carried out immediately following the company doctors' inclusion in the SARS-CoV-2 vaccination process. In strict compliance with the TROX hygiene concept, vaccination centres were set up in the canteen at the Neukirchen-Vluyn production facility and in the visitor centre at the Anholt production facility. We facilitated the first and second vaccinations of 453 people, with the vaccinations being performed by the occupational health service of ASD Rhein-Ruhr. Moreover, we facilitated the booster vaccination of 546 employees at the Neukirchen-Vluyn, Anholt and Goch sites via Dr. Bongards practice in Neukirchen-Vluyn.

To minimise the financial risk that could result from a state of emergency such as the coronavirus pandemic, for both the company and for our employees, the 'Temporary Measures' and 'Short-time Work' works agreements were passed in early 2021. However, thanks to the consistently good capacity utilisation of our company, none of these works agreements had to be used. However, we are proud of our duty of care towards our employees, as it meant that we would have been well prepared.

We care about the health and well-being of our employees.

The potential for a company development that uses productivity and sustainability as a common driving force for a successful future is something we see in our employees. It is only by working together we can achieve more.

We introduced an occupational and health management policy at TROX in 2019 that enables us to intensively address the concerns of our employees as well as initiate measures. This includes jointly identifying and averting potential areas of stress or looking at personal health aspects on an individual basis. It also includes developing measures and plans that offer our employees well thought-out options in the event of situations such as the planned closure of the Goch factory due to the relocation of pocket filter production. Reconciliation of interests and social compensation plans were established to ensure that most employees could move to the factories in Neukirchen-Vluyn and Anholt or to a specially set up transfer company.



We promote professional skills.

TROX offers a wide range of different apprenticeships. Year after year, many young people come to us to benefit from a strong training concept that will accompany them on their learning journey. We believe that training must be provided in a targeted and needs-based manner.

And it has been a success. In the Chamber of Industry and Commerce final examinations, one of our trainees was named the best technical product designer in the entire Duisburg chamber district. In the chamber district of North Westphalia, two trainees came out on top as the state's best trainees in the metalworking specialist profession. We believe that this is testament to the effectiveness of our training concept and to our ability to inspire young people in their chosen occupation.

In 2021, 68 young people in Germany took advantage of this opportunity. In addition, there are numerous interns, working students and graduates working on their final project at TROX.

In the area of further training for our employees, many of our external providers adapted to the pandemic situation in 2021 and offered people the option of completing their training courses and seminars online. Further training measures could thus be carried out for our employees again – without an increased risk of infection with SARS-CoV-2. Our goal by 2025 is for at least 90% of TROX employees to be trained in core areas such as occupational and IT security and compliance. In 2021, TROX provided more than €430,000 for employee and management development.



We offer special work-life options.

We want happy employees who feel comfortable in their workplace. For this reason, we critically scrutinise the working environment on a regular basis and take personal concerns into consideration.

For instance, since 2021 we have been working with a new catering company that has been anchoring the topic of sustainability into its corporate philosophy for many years. For our employees this means healthier and more sustainable meals through more plant-based offers and a conscious consumption of meat, sustainable packaging and less food waste.

When it comes to retirement, we offer flexible solutions – from partial retirement to early reductions in hours to the option of working beyond the standard retirement age.

Through our TROX X-FIT+ health programme, our staff members have access to health-promoting measures such as discounted gym memberships, 'active breaks' in cooperation with the health insurance provider, sleep and bio-impedance measurements and flu jabs. A permanent BGM/BEM officer also works on the development of individually tailored measures to promote the health and well-being of employees.



We promote fairness and integrity – worldwide.

Treating our employees, customers and business partners fairly is important to us. Our ethical fairness and integrity guidelines ensure equal opportunities for all, they safeguard the dignity of all human beings and provide for the prevention of discrimination and corruption.

We firmly believe that corporate success cannot come at the expense of exploiting or disregarding human needs and environmentally friendly processes. This is why we also promote the sustainability of the TROX GROUP beyond the factory gates with respect to healthy, ethically correct cooperation. It is our responsibility to include the people who work with us and for us. This is the only way we can be proud of our products and their entire value chain.

For this reason, we have made it a requirement for our suppliers worldwide to comply with our Code of Conduct: namely to guarantee human and children’s rights, prevent discrimination, ensure a healthy, safe workplace, comply with environmental laws and minimise environmentally harmful processes (see p. 74/75). Our goal is to have reviewed at least 90% of our suppliers for sustainability by 2025.

We also have our own, group-wide compliance programme, which we utilise to ensure compliance with our internal company guidelines and statutory provisions. The core of our compliance programme is the globally standardised code of conduct entitled the ‘TROX GROUP Business Conduct Guideline’. Every employee is given a copy of the code, which all employees and managers pledge to uphold. This code describes our principles of conduct and addresses not only topics such as corruption and competition law, but also areas such as export controls, data protection and conflicts of interest – all stipulated independently of our contractual partners.



In addition, we set up the TROX Trust Channel whistleblower system for our employees, but also for our customers, suppliers and other business partners. The system can be used worldwide, compliance violations can be reported and information can be provided about white-collar crime or actions that are harmful to the company. For us, this is an additional tool to ensure fair, environmentally friendly coexistence.

Satisfied employees strengthen the company.

Fair and good pay and ideal working conditions are the basic requirements for having motivated and dedicated staff members. The Federal Employment Agency reports that average employee turnover was 17% in the metal and electronics industry in 2018. With a global staff turnover of 7.3%, TROX is far below this average. Our staff members currently stay with us for 12.2 years on average.

The TROX ACADEMY is reaching more and more people.

In order to protect people from SARS-CoV-2 infection while we share knowledge and expand skills, we have further adapted the range of seminars and training courses offered by the TROX ACADEMY 2021 to the pandemic situation – from the development of reliable hygiene concepts to the seasonal compression of in-person seminars to be held the summer months to the implementation of basic training in the form of virtual events.

The range of services offered by the TROX ACADEMY now includes

- **For external interested parties:** Web seminars, face-to-face training courses, symposia, factory visits and consultations with TROX
- **For employees:** Web seminars, product-related events/training courses and the ACADEMY platform for data exchange with our subsidiaries and support in setting up individual ACADEMIES



A multitude of webinars explaining ventilation options for schools in general and in pandemic situations.

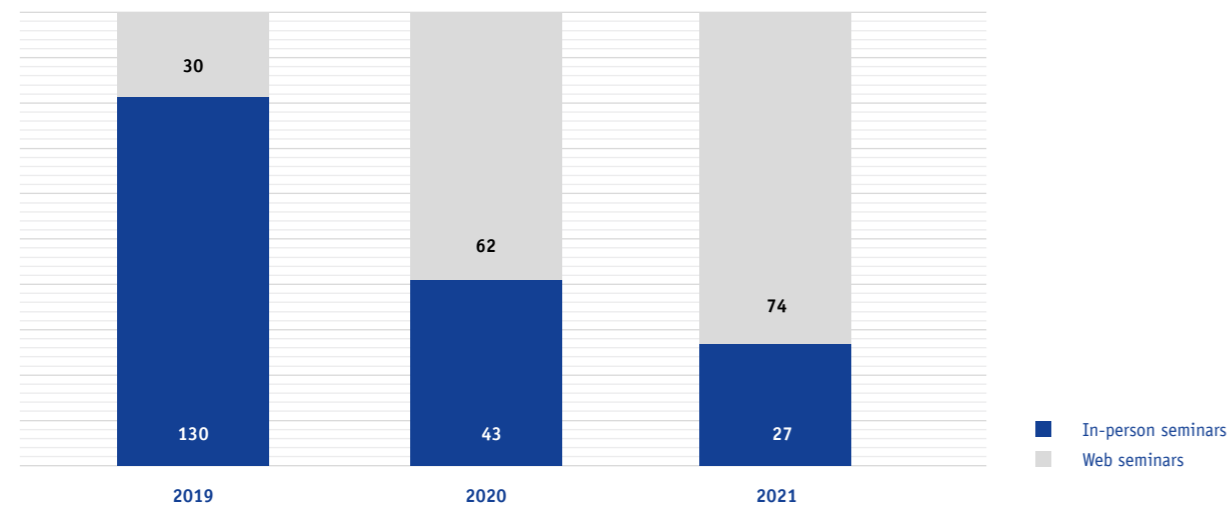
Cases of corruption	2015	2016	2017	2018	2019	2020	2021
Number of cases in which staff members were dismissed or other disciplinary measures were taken due to corruption	0	0	0	0	0	0	0
Number of cases in which contracts with business partners were not renewed due to violations related to corruption	0	0	0	0	0	0	0



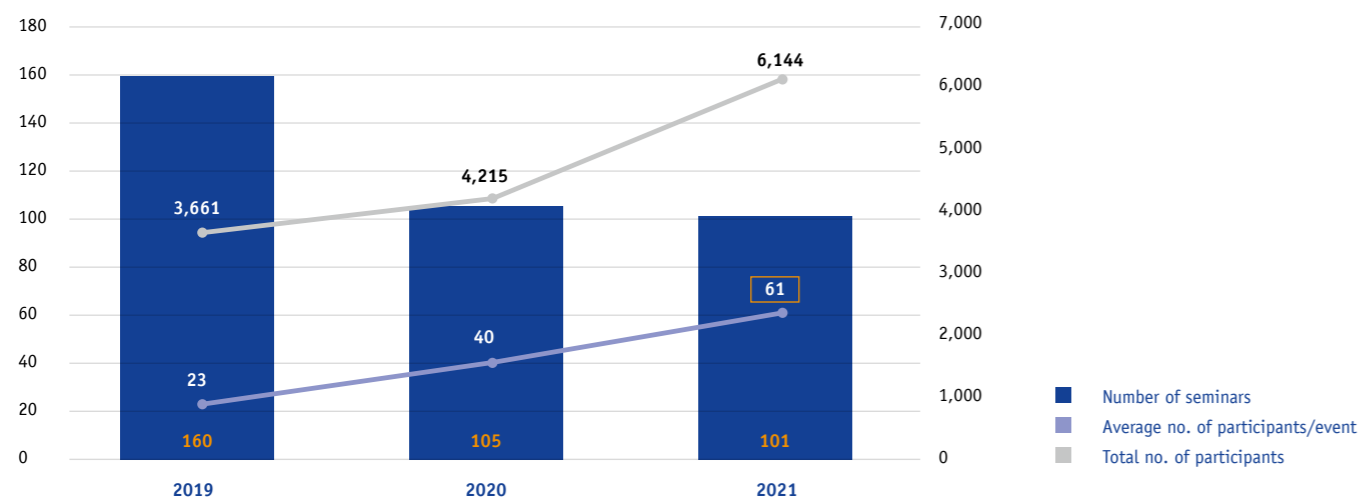
Overall, there is a clear trend emerging: significantly more online events took place in 2021, and this was accompanied by a huge increase in the number of participants. In this way, the average number of participants per seminar has increased to 61 people.

THE TROX ACADEMY HAD 46% MORE PARTICIPANTS THAN IN THE PREVIOUS YEAR

Face-to-face and online events of the TROX ACADEMY



Number of seminars and participants of the TROX ACADEMY



Social performance factors at the TROX GROUP

	2018	2019	2020	2021
Number of staff members	3,789	4,007	4,316	4,571
Staff turnover rate (%)	7.6	7.8	6.9	7.3
Average age (years)	39.0	39.3	41.8	41
Average period of employment (years)	13.0	12.7	12.2	12.2
Number of permanent staff members	3,474	3,681	3,960	4,286
Number of part-time staff members	244	284	214	288
Number of positions filled by women	660	753	829	894
Number of women in senior positions	43	49	53	58
Number of staff members with severe disabilities*	97	95	92	96
Number of apprentices*	58	65	78	68
Sickness rate (%)	4.5	5.4	5.7	4.6

*only in the German companies (TROX GmbH, TROX X-FANS, TROX HGI, Dr. Ermer).



Udo Jung
Member of the Board of Management of TROX GmbH

'IF THE CORONAVIRUS CRISIS HAS SHOWN US ANYTHING, IT IS THAT GOOD INDOOR AIR QUALITY AFFECTS US ALL. THANKS TO NUMEROUS STUDIES, WE ARE NOW AWARE OF THE POSITIVE EFFECTS OF FRESH, CLEAN AIR ON OUR HEALTH AND OUR PERFORMANCE. AND WE KNOW THE SOLUTIONS. WE WANT TO CHANNEL THIS KNOWLEDGE THROUGH OUR ASSOCIATION WORK AND ALSO MAKE IT ACCESSIBLE TO THE GENERAL PUBLIC. BECAUSE GOOD AIR MEANS GOOD HEALTH.'

PUBLIC RELATIONS



Public relations

We place great importance on transparent, honest and responsible communication about the sustainability issues and developments of our TROX GROUP and want to make the resulting knowledge accessible to everyone for the benefit of people.

Air and energy efficiency are of immense importance to us as a global leader in ventilation and air-conditioning technology. Accordingly, we intensively research and develop technologies and mechanisms that ensure good, healthy indoor air and continue to increase the energy efficiency of our products and system solutions. In addition, we are involved in the relevant associations, organisations and committees for regulations, guidelines and laws that enforce high sustainability requirements in our industry. It is important to us to build a bridge between science, practice, politics and society and to publicise the relevant sustainability issues and solutions of our time.

Our association work creates clarity.

A good example of TROX's high-profile commitment is the **'Lebensmittel Luft' (air as an essential element of life) campaign of the Fachverband Gebäude-Klima e.V. (FGK)**, in which TROX is actively involved.

The campaign uses a wide variety of media to provide companies, associations, science, politics, society and the public with well-founded and study-based information, e.g. about why good air is not only of the utmost importance in times of a pandemic or how to create good air in rooms where people are spending time. The website www.lebensmittel-luft.info contains numerous application examples – as well as direct links to contact partners and solutions, calculation tools for indoor air quality, funding programmes in the field of ventilation and air conditioning and informative publications.

The 'Air as an essential element of life' campaign explains the effects of healthy air indoors in a clear and comprehensive manner and provides information about the available options to ensure good indoor air quality via mechanical ventilation in an effective, energy-saving and continuous manner.

Through our participation in this association campaign, we are helping to bring the immense value of healthy air into focus and to trigger a rethink – and primarily action – among decision-makers in politics and practice. The goal is to ensure that air, as an essential element of life, is given the status that it deserves in every cost-benefit analysis for the benefit of our well-being.

TROX CONNECTS SCIENCE, PRACTICE, POLITICS AND SOCIETY



HEINZ TROX
STIFTUNG

AACHENER TAG
DER LUFTQUALITÄT
& NACHHALTIGKEIT
IN SCHULEN

Herzlich willkommen!



As part of our association work, we also played a role in the creation of **VDMA Information Sheet No. 12**, which comprehensively addresses the use of smoke extraction/ventilation systems to reduce infectious aerosols in buildings. Based on the calculation methods published in the FGK Status Report 52, it illustrates how added value can be achieved via ventilation in existing systems – with application examples of an event hall, underground car park and stairwell. The options listed in VDMA Information Sheet No. 12 ensure better air quality and improve health protection in the workplace. That is what we are committed to.

The **VDMA Specification 24000** is also the result of joint association work in terms of sustainability. This document, which was published in 2021, offers a summary of the legal requirements for the functional tests of fire dampers and makes a clear recommendation on the required intervals. This creates security and opens up opportunities for energy savings. For example, it recommends that any part of the building that is no longer used by people after work be disconnected from the air supply and equipped with digitally controllable, motorised fire dampers. In addition to energy savings, this equipment enables longer maintenance intervals and offers effective smoke protection. These are points that benefit the environment and people.



Indoor-Air, the industry's first in-person trade fair in 2021.

Presenting pioneering system concepts, new strategies and innovative technologies and products in face-to-face discussions at trade fairs has always been part and parcel of our exchange with stakeholders – and then came Covid. By the second year of the pandemic, it had become more and more important to us that we share the knowledge we had gathered up to that point and present solutions with proven effectiveness.

On the initiative of TROX, Indoor-Air finally took place in Frankfurt in October 2021. The strict protection and hygiene concept of the trade fair was optimally supplemented by the TROX ventilation technology installed in Hall 12 with 100% fresh air supply.

In addition to interested parties from industry, representatives of authorities, health and education authorities, schools and hospitals involved in the acute pandemic situation also received reliable answers to the many questions about healthy air and optimal protection against infection indoors with and without mechanical ventilation.

The On Air – Forum on Air as an Essential Element of Life congress, which was also held by the FGK together with Messe Frankfurt, concluded the exchange of information with expert panels and podium discussions with experts from industry, business, technology, science and medicine.

Thanks to Indoor-Air, all the important and relevant information on one of the most important topics of 2021 was provided to precisely those people who can make a difference and offer clean, healthy air indoors. We will continue to promote this type of communication with our stakeholders.



indoorair



TROX technology on tour.

2021 also saw the TROX Trailer go on tour to show the efficiency of our products and systems directly on site. At the Installatie Vakbeurs exhibition in Hardenberg in the Netherlands, approx. 7,000 visitors received extensive information and got to have a first-hand look at our TROX technology.

We multiply the knowledge of the experts.

Research, development and documentation work is carried out all over the world – in 2021, the pandemic resulted in extremely intensive efforts to research the coronavirus and ways to minimise the risk of infection indoors. We bring these experts together to ensure that they are heard and that a common consensus can be found through congresses such as ‘On Air – Forum on Air as an Essential Element of Life’ and the ‘Aachen Air Quality Day’, which was initiated by the Heinz Trox Foundation.

A new exchange platform for science, practice and politics was launched with the title ‘Aachen Day of Air Quality and Sustainability in Schools’. The common tenor in 2021: finding sustainable solutions for an optimum learning climate in schools.

At both events, internationally recognised experts presented their studies and results, while implementation options were discussed and examined from various perspectives.

In Dr. Eckart von Hirschhausen, another extremely committed and prominent communicator was brought to the table. As a doctor, science journalist and founder of the ‘Healthy Earth Healthy People’ foundation, he is very much aware of the health effects of clean air and is committed to change. His work thus includes providing stimulating and entertaining contributions and panel discussions at our events and far beyond.

There was unanimity among the visitors and experts at both events: mechanical ventilation systems are what is needed to ensure an optimum indoor climate and the highest protection against infection. Against this background, we feel it is important to bring together representatives from all sectors involved, right down to the political decision-makers, and to bring clarity to complex relationships via open, informative communication in order to initiate concrete implementation. The ultimate goal being a healthy earth and healthy people.

We communicate openly, comprehensively and responsibly.

As a global company with high values, we also place high demands on the way we communicate with our stakeholders. We do not wish to raise expectations we cannot meet but to provide sound and valid information. As a competent, honest and reliable partner in anything we say and do.

For us, good communication is not a one-way street, but rather it is an interaction with our customers, business partners, employees and friends – via video interviews, e-mail newsletters, social media and ACADEMY events, at trade fairs, congresses and conferences or through the use of the TROX Roadtruck on site at our wholesalers’.

We are in direct contact with our employees via the intranet and our website is constantly being supplemented with videos on our products and on the currently relevant topics for our customers. We reach shareholders and lenders through shareholders’ meetings, supervisory board meetings, personal and virtual meetings and regular written reports.

In addition to digital formats, we also consciously use printed media, something we use to help slow down our hectic lives and give people a chance to sit back and read in their own time.

With content that is relevant to our stakeholders, regardless of their age, affinity towards digital media, their function or their position. After all, we want to focus on the people that we have been connected to for many years through mutual loyalty, and on their well-being.

As with publications such as the TROX life magazine, we therefore explore social and topical issues such as sustainability or air and pharmaceuticals in a way that is both scientific and entertaining.



OPEN, HONEST COMMUNICATION IS IMPORTANT TO US



SUMMARY

2040

Christine Roßkothen

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



'WE HAVE TAKEN A MAJOR STEP TOWARDS ACHIEVING OUR GOAL OF BEING CLIMATE-NEUTRAL BY 2040. SUSTAINABILITY HAS BEEN A KEY ISSUE ACROSS THE BOARD AT TROX FOR QUITE A LONG TIME AND IT IS A TOPIC THAT HAS THE EQUAL SUPPORT OF BOTH EMPLOYEES AND MANAGEMENT. HOWEVER, THERE WAS ONE ASPECT OF SUSTAINABILITY IN PARTICULAR THAT EMERGED AS A KEY PRIORITY FOR TROX IN 2021, NAMELY HEALTH – WITH SOLUTIONS FOR OUR GROUP OF COMPANIES AND FOR THE WHOLE WORLD.'

TROX to become climate-neutral – for people

At TROX, sustainability is ultimately something that is fundamental to the well-being of people.

Our TROX GROUP is well on the way to achieving its own sustainability goal of climate neutrality by 2040. The increasingly precise and extensive recording of our consumption and emissions plays a very important role here. This is because their evaluation allows us to specifically explore and tackle effective sustainability measures. In addition, thanks to the high-performance TROX CSR organisational structure, we ensure that any sustainability commitment on the part of TROX takes place in constant exchange with all relevant departments and levels and that our stakeholders are involved in the flow of information.

With intermediate targets up to 2025, we have a clear course.

We have set ourselves specific interim goals on our journey to achieving climate neutrality within the TROX GROUP. They define what we want to achieve in the medium term and what we should focus on in our fields of action.

For us, people are more important than anything else.

At TROX, all aspects of sustainability are about people. In our efforts to provide healthy air indoors as a climate- and resource-neutral TROX GROUP, we act sustainably in two respects: through our savings in energy, CO₂ and resources over the entire life cycle of our products, people benefit from an improved climate and environmental protection – and our range of highly efficient ventilation and air-conditioning solutions ensures fresh, healthy breathing air in buildings.

Health and well-being, the third of the 17 UN Sustainable Development Goals (SDGs) supported by TROX, plays a very special role for us. In accordance with our guiding principle 'The human being is the yardstick, and people's well-being is our goal', SDG3 is an integral thread running through our sustainability measures – from the development of highly efficient, health-promoting ventilation and air-conditioning solutions to the implementation of safe and good working conditions and the design of a supply chain that complies with our ethical guidelines of integrity and fairness.

Across the board, stakeholders can rely on a TROX GROUP with fundamental values. Lived by our employees around the world, they define what TROX stands for internally and externally: trust, safety, reliability, quality and sustainability.

In a world where political agreements on climate and resource protection are nowhere near being adequately implemented, we want to show one thing clearly with our commitment to sustainability: **that it works!**



2040

Sustainable projects by TROX

In addition to energy and CO₂ savings through efficient TROX technology, the issue of perfectly integrated service in the construction and operating phases of a building project is becoming increasingly important. With TROX, it is easy to save costs, time and energy.

Headquarters of MAAF Assurances SA, Niort, France.

Over the course of the renovation of the MAAF headquarters in Niort, the decision was made to use ventilation technology from TROX. The building is BREEAM-certified and has been nominated for the BIM d'Or award. The requirements for energy efficiency and sustainability were correspondingly high.

The customer, architect, planning office and installer all agreed and opted for the high-performance BID underfloor induction unit from TROX. Playing a key role in this decision was the remarkable heating and cooling capacity, which enables the number of units, and thus the costs, to be reduced and paves the way for gains in modularity. In addition, the free-cooling mode ensures optimal energy performance. And the comfort criteria for employees are also ideal – thanks to reduced airflow velocities and noise levels, combined with very good air quality.

TROX France fitted the TROX BID with valves and AFN cover grilles at the factory. The renovation of the MAAF headquarters was successfully completed in 2021.

The TROX technology installed in this building thus ensures cost-effective and sustainable energy-saving operation.





Leuphana University Lüneburg

The central building of Leuphana University in Lüneburg is an architectural milestone in the dynamic campus development. An important and certainly the most striking part of the complex is the Libeskind Auditorium for up to 1,100 people.

Essential design criteria included a particularly sustainable construction and the resource saving use of electricity for lighting, ventilation and cooling. The façade is inclined so that the building casts its own shadow, which results in passive cooling. The various parts of the building are arranged in such a way that no external wall faces south.

The presence- and daylight-dependent LED lighting system, excellent insulation, triple glazing and heat recovery as well as the use of low-temperature waste heat ensure maximum energy efficiency. Energy is provided by renewable sources. The heat comes from a power plant that runs on biogas. And solar systems on the campus buildings cover 25% of the electricity requirements.

Specialist consultants and HVAC contractors saw the ideal complement to this comprehensive sustainability concept in the perfectly coordinated ventilation and air-conditioning components from TROX: from the central air handling unit to volume flow controllers and air terminal devices to fire protection components such as smoke extract fans and fire dampers. The TROX ventilation and air-conditioning system ensures demand-based air supply while the fire protection system keeps people safe.

The modern, sustainable architecture and equipment of the central building of the Leuphana University Lüneburg are testament to how the concept of responsible construction can be implemented effectively and harmoniously.





New production facility of Pfizer, Freiburg.

HighCon, Pfizer's new high-containment facility, is considered to be one of the largest and most advanced facilities for the production of highly potent pharmaceuticals in Europe. The sustainability strategy adopted by Pfizer is based on the UN's Sustainable Development Goals. A sustainable clean room concept has therefore been implemented together with TROX.

A reliable and safe ventilation and air-conditioning system relies on intelligent air management – combined with effective air filtration (HEPA filter). The integrated concept with components from TROX ensures that the air-conditioning and ventilation components function effectively together.

Targeted overpressure control in clean room production helps to prevent contamination and unwanted air or unwanted particles from penetrating other areas. For the safe operation of the clean rooms, a number of OEB-4 classified high-performance particulate filters of filter class H13 (99.95% for $< 1 \mu\text{m}$) were installed in the ceiling and other filters and filter unit systems were integrated into the critical process areas. The filters can be changed easily.

A special feature is the ventilation system X-CUBE CROFCU. This highly economical system can be placed in suspended ceilings thanks to smaller air duct cross-sections. And the fact that the outdoor air flow rate can be reduced cuts energy consumption by around 50%. Compared to conventional centralised air treatment with 100% outdoor air operation, the TROX X-CUBE CROFCU ventilation system at Pfizer achieves savings of €528,000/year and a CO₂ reduction of 1,060 t/year. In addition, its use reduces the required diameter of the duct system, which has saved approx. €1.19 million here.

With this sustainable clean room concept, Pfizer's HighCon is a factory of the future that perfectly combines economy, health and ecology.



About this report

2021



FORMAT AND CYCLE

The TROX Sustainability Report 2021 is published in print and online. Its contents are available as a complete document in PDF format for download at www.troxtechnik.com. The sustainability report is completely revised and published every year.

SUSTAINABLE DEVELOPMENT GOALS (SDGS)

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. According to the business activities, six SDGs have a special status in the company. Specific activities are presented in the respective chapter.

GLOBAL REPORTING INITIATIVE (GRI)

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. The GRI Index (see p. 132/133) 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 a company and stakeholder perspective.

REPORT CONTENT

The main themes of the Sustainability Report 2021 are the importance of fresh air indoors as an indispensable component of human health, the strategic orientation in accordance with the SDGs and sustainability management in the company. Targets and measures have been formulated as part of the TROX sustainability strategy, and these are addressed in the six strategic fields of action of products, production, mobility and logistics, infrastructure, social matters and public relations. The six fields are subject to the activities and effects of the TROX value chain.

The reporting period covers the entire 2021 financial year of the TROX GROUP (1 January to 31 December 2021). The editorial deadline for this report was 10 June 2022.

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

For better readability, some numbers have been rounded.

CONTACT

Your opinion is important to us. Questions or suggestions can be sent to us by e-mail: christine.rosskothen@troxgroup.com

The TROX GROUP

2021

The TROX GROUP at a glance – relevant key figures

TROX GROUP sales
in million €

600
2021

516
2020

Production sites
worldwide

20
2021

19
2020

CO₂ emissions
of the TROX GROUP
in t/mill. euros
invoiced

27.1
2021

31.2
2020*

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 IS A FACTOR IN PEOPLE'S QUALITY OF LIFE

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

Operating subsidiaries
of the TROX GROUP

34 in 29 countries
2021

33 in 29 countries
2020

CO₂ emissions
of the TROX GROUP
in t

16,454
2021

16,394
2020*

Social performance indicators at the TROX GROUP

Staff members
at the end of the year

4,571
2021

4,316
2020

Staff turnover
in % of the headcount

7.3%
2021

6.9%
2020

Average period
of employment
in years

12.2
2021

12.2
2020

Permanently employed
staff members

4,286
2021

3,960
2020

Part-time
staff members

288
2021

214
2020

Average age
in years

41
2021

41.8
2020

Positions filled
by women

894
2021

829
2020

Women in senior positions

58
2021

53
2020

**This figure deviates from the TROX Sustainability Report 2020, owing to better data capture.

GRI standards table

INDICATOR	GRI STANDARD	DESIGNATION	REFERENCE SUSTAINABILITY REPORT 2021	PAGE	SDG
100s – GENERAL INFORMATION					
Organisational profile	102-1	Name of the organisation	Imprint		
Organisational profile	102-2	Activities, brands, products and services	The TROX GROUP in 2021	2, 3	
Organisational profile	102-3	Headquarters of the organisation	Imprint		
Organisational profile	102-4	Business premises	The TROX GROUP in 2021	2, 3	
Organisational profile	102-5	Ownership structure and legal form	The TROX GROUP in 2021	2, 3	
Organisational profile	102-6	Markets served	The TROX GROUP in 2021	2, 3	
Organisational profile	102-7	Size of the organisation	The TROX GROUP in 2021	2, 3	
Organisational profile	102-8	Information about staff members and other employees	Social matters	108	8
Organisational profile	102-9	Supply chain	Production	74, 75	8
Organisational profile	102-10	Significant changes in the organisation and its supply chain	Publication of the 2021 Annual Report in the Federal Gazette		
Organisational profile	102-11	Precautionary principle or precautionary measures	Management, The TROX sustainability strategy, The TROX fields of action	28–31 32–37 50–55	
Organisational profile	102-12	External initiatives	Stakeholders, Public relations	38–41 110–117	17
Organisational profile	102-13	Membership in associations and interest groups	Public relations	110–117	17
Strategy	102-14	Statement from senior decision maker	Perspectives	6	
Ethics and integrity	102-16	Values, policies, standards and norms of behaviour	Our attitude, The TROX sustainability strategy	9 32–37	8, 13
Company management	102-18	Leadership culture	Management	28–31	
Involvement of stakeholders	102-40	List of stakeholder groups	Stakeholders	38–41	17
Involvement of stakeholders	102-41	Collective agreements	–		
Involvement of stakeholders	102-42	Identification and selection of stakeholders	Stakeholders	38–41	
Involvement of stakeholders	102-43	Approach to stakeholder engagement	Stakeholders	38–41	17
Involvement of stakeholders	102-44	Key issues and concerns raised	Stakeholders	38–41	
Reporting procedure	102-45	Entities mentioned in the consolidated financial statements	Publication of the 2021 Annual Report in the Federal Gazette		
Reporting procedure	102-46	Defining report content and topic boundaries	Air is life, Goal, The TROX sustainability strategy, The TROX fields of action	16–19 22–27 32–37 50–55	
Reporting procedure	102-47	List of essential topics	Goal, Stakeholders	22–27 38–41	
Reporting procedure	102-48	Reformulation of information	–		
Reporting procedure	102-49	Reporting changes	–		
Reporting procedure	102-50	Reporting period	About this report	129	
Reporting procedure	102-51	Date of most recent report	About this report	129	
Reporting procedure	102-52	Reporting cycle	About this report	129	
Reporting procedure	102-53	Contact details for questions about the report	About this report	129	
Reporting procedure	102-54	Statements on reporting in accordance with the GRI standards	About this report	129	
Reporting procedure	102-55	GRI content index	GRI standards	133 ff.	
Reporting procedure	102-56	External audit*			
Management approach	103-1	Explanation of the main topic and its delimitation	Stakeholders, The TROX fields of action	38–41 50–55	
Management approach	103-2	The management approach and its components	Management, The TROX fields of action	28–31 50–55	
Management approach	103-3	Assessment of the management approach	Management	28–31	

*This report is not externally audited.

INDICATOR	GRI STANDARD	DESIGNATION	REFERENCE SUSTAINABILITY REPORT 2021	PAGE	SDG
200s – ECONOMY					
100s – General information	103	Management approach	Production, Infrastructure, Social	70 89 103	
Economic performance	201		Goal, Non-financial report	26, 27 131	8, 9, 13
Indirect economic effects	203		Our attitude, Infrastructure	9 86–99	8, 9, 13, 17
Procurement practices	204		Production	74, 75	8
Anti-corruption	205		Social matters	106	8
Anti-competitive behaviour	206		Social matters	106	8

INDICATOR	GRI STANDARD	DESIGNATION	REFERENCE SUSTAINABILITY REPORT 2021	PAGE	SDG
300s – ENVIRONMENT					
100s – General information	103	Management approach	Production, Infrastructure, Social	70 89 103	
Materials	301		Products, Production, Mobility and logistics, Infrastructure	62, 63, 67 72, 73 84, 85 96, 97	9, 12, 13
Energy	302		Products, Infrastructure	63–67 88–95	9, 12, 13
Emissions	305		Products, Mobility and logistics, Infrastructure	60–67 78–80 88–95	3, 8, 9, 12, 13
Waste	306		Infrastructure	96, 97	3, 9, 12, 13
Supplier environmental assessment	308		Production	74, 75	13

INDICATOR	GRI STANDARD	DESIGNATION	REFERENCE SUSTAINABILITY REPORT 2021	PAGE	SDG
400s – SOCIAL MATTERS					
100s – General information	103	Management approach	Production, Social	70 103	
Employment	401		Social matters	102–109	8
Employee-employer relationship	402		Social matters	102–109	8
Occupational safety and health protection	403		Social matters	104	3, 8
Training and further training	404		Social matters	105, 107	8
Diversity and equal opportunities	405		The TROX sustainability strategy, Social	33–35 103	8
Non-discrimination	406		The TROX sustainability strategy, Social	33–35 103	8
Freedom of association and collective bargaining	407		Social matters	106	8
Child labour	408		Social matters	106	8
Forced or compulsory labour	409		Social matters	106	8
Checking for compliance with human rights	412		Production, Social matters	74, 75 106	3, 8
Supplier social rating	414		Production, Social matters	74, 75 106	3, 8
Socio-economic compliance	419		Social matters	106	8

Glossary

Sustainability

A

AIR POLLUTANTS

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

CIRCULAR ECONOMY

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

B

BIODIVERSITY

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

BUND

Bund für Umwelt und Naturschutz Deutschland e. V. (German Federation for Environment and Nature Conservation)

C

CARBON DIOXIDE (CO₂)

A chemical compound of carbon and oxygen.
A greenhouse gas, non-toxic, colourless and odourless.
It is produced in particular through combustion of fossil fuels such as coal.

CARBON MONOXIDE (CO)

Toxic, flammable and odourless gas. It is produced through incomplete combustion of fossil fuels such as coal.

CFCs

Chlorofluorocarbons that are used as propellant gases, refrigerants or solvents. These had a disastrous effect on the ozone layer and were banned in 1989. The ozone layer has regenerated since.

CLIMATE ADJUSTMENT

Measures for dealing with global warming.

CLIMATE NEUTRALITY

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

CO₂

Non-toxic, odourless and flammable gas. 37 billion tonnes of CO₂ are released to the atmosphere every year. Of this, China accounts for 28%, the USA for 15%, Europe for 10%, Latin America for 6%, Russia for 5%, Africa for 4%, and the rest of the world for 32%. 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). Around 1,200 kg of CO₂ are not produced as a result.

CORPORATE SOCIAL RESPONSIBILITY

Social responsibility assumed by companies that goes beyond legal requirements.

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 result of diesel emissions.

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.

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 substances and energy transfer media that are an environmental burden. In Germany: tax on fossil fuels and electricity.

EMISSION

Substance or radiation discharged by a source, e.g. CO₂ or noise emission.

EMISSIONS TRADING

Trading with certificates permitting emissions.

ENERGY

Ability to perform work (in physics), specified in joule or watts.

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.

F

FAIRTRADE LABEL

Label to identify goods that stem fully or in part from 'fair trading' that is defined based on set criteria.

FINAL ENERGY CONSUMPTION

Energy consumed by end users (e.g. diesel from the fuel pump, electricity from an electrical appliance).

FINE DUST

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

FONA STRATEGY

With its FONA strategy to promote research and sustainability, the German Federal Research Ministry is going to double the amount available for research funding in the fields of climate protection and sustainability to EUR 4 billion.

FRIDAYS FOR FUTURE

Global social initiative by students, striving to implement comprehensive climate protection measures as quickly as possible.

FUEL DUTY

Excise duty on oil and natural gas.

G

GEOENGINEERING

The endeavour to fix what has been destroyed on earth in the past through various measures.

GERMAN SUSTAINABILITY CODE (DEUTSCHER NACHHALTIGKEITSKODEX, DNK)

The DNK provides for 20 criteria to guide the establishment of sustainability reporting. These are reviewed for formal completeness and qualified feedback is drawn up.

GREENHOUSE EFFECT

The effect that greenhouse gases in an atmosphere have on the surface temperature of a planet. As long-wave radiation cannot pass through CO₂, 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 1.5 billion 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.

GRI STANDARD

Internationally recognised guidelines for drawing up sustainability reports, developed by the Global Reporting Initiative.

H

HALF-LIFE PERIOD

The period in which half of the atoms of a substance decay.

I

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 gas. Named after the place where it was signed: Kyoto in Japan (1997). German goal: To achieve by 2012 a reduction of CO₂ emissions 21% below the 1990 level.

L

LCC (LIFE CYCLE COST)

The costs related to a product from its idea through to withdrawal from the market.

LIGNITE

8 billion tonnes are extracted worldwide every year, mostly through surface mining. Around 90% are used by power stations to produce electricity. Coal-fired power stations cater for about 40% of the global electricity demand.

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.

LOCAL TRANSPORT

Journeys of less than 50 km or with a travel time of under 1 hour.

M

MEAT CONSUMPTION

Global meat consumption has increased sixfold since 1950. Annual meat consumption per capita: North America 120 kg, South America 76 kg, Europe 90 kg, China 50 kg, Africa 14 kg.

METHANE (CH₄)

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

N

NITROGEN OXIDES NO_x

Collective term for gaseous oxides of nitrogen.

NUCLEAR POWER STATION

441 reactors were in operation in 2020. 106 in Europe, 94 in the US, 49 in China, 37 in Japan, 38 in Russia, 154 in other countries worldwide.

O

OECD

Organisation for Economic Co-operation and Development.

OZONE LAYER

Atmospheric layer that shields the earth from UV radiation.

P

PARTICLES

Small objects, such as dust; see diesel emissions.

PRIMARY ENERGY

Energy contained directly in energy sources (e.g. fuel value of coal). Primary energy carriers include coal, lignite, crude 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

RECYCLING

Material recovery.

RECYCLED PAPER

Paper made from waste paper.

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

SOOT PARTICLES

Main component of fine dust. Released when organic substances such as wood or diesel fuel are burned.

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. 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.

...

Imprint

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 for balancing environmental, social and economic objectives to allow for future-oriented development in line with intergenerational justice.

SUSTAINABILITY COUNCIL

The German federal government's advisory council for sustainable development.

SUSTAINABLE FINANCE ADVISORY BOARD

Formed by the German Federal Government in June 2019 to draw up specific, practical recommendations for the required sustainable transformation process in the real and financial economies.

SUSTAINABILITY STRATEGY

Practical guidelines to facilitate sustainable actions of policy-makers and the society. The goal is to achieve development that is balanced with regard to the environment, the economy and social matters.

U

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-added chain. Depiction of production as a sequence of value adding activities during which resources are used.

W

WASTE

The term waste in the sense of the Recycling Act covers all substances or items that their owner would like to, has to or does dispose of. The Recycling Act distinguishes between waste for recovery and waste for removal. Waste for recovery is any waste that is utilised, waste that is not utilised is considered waste for removal.

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.

Published by:

TROX GmbH
Heinrich-Trox-Platz
47504 Neukirchen-Vluyn
Germany
www.troxtechnik.com

Production

TR advertising GmbH
Arnulfstraße 33
40545 Düsseldorf
Germany

Image Sources

TROX GmbH,
Adobe Stock, iStockphoto,
United Nations; 17Ziele.de
(p. 47–49, 52–55),
DB Vertriebs GmbH (p. 81/82),
FGK/Antonioguillem – stock.adobe.com (p. 113),
Pfizer Deutschland GmbH (p. 126/127)

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21



TROX[®] TECHNİK
The art of handling air