

20
20

Sustainability

2020



TROX® TECHNİK
The art of handling air

TROX® TECHNİK
The art of handling air

Contents

Sustainability Report 2020

Sustainability at TROX

- 04 Perspectives
- 08 Development
- 10 Milestones
- 14 Sustainability and COVID-19 at TROX
- 20 Our sustainability goal
- 24 Management and processes

The TROX sustainability strategy

- 26 Strategy
- 30 Sustainability at the core of TROX
- 34 TROX and the 17 Sustainable Development Goals

The TROX fields of action

- 38 Our attitude towards climate protection
- 46 Products
- 56 Production
- 64 Mobility and logistics
- 72 Infrastructure
- 84 Social matters
- 92 Public relations

- 98 Summary
- 102 Sustainable projects by TROX

Non-financial report

- 108 The TROX GROUP at a glance – relevant key figures
- 108 Social performance indicators at the TROX GROUP
- 110 Glossary
- 115 Imprint

Sustainability at TROX

The TROX GROUP in 2020

In the year 2020 that was characterised by the COVID-19 pandemic, we succeeded to observe social distancing requirements, while still operating successfully and maintaining close contact to customers, staff and suppliers. This was possible thanks to the fact that we had focused on digitisation early on.

SUSTAINABILITY

33
subsidiaries
worldwide

4,316
staff members
of various nationalities

50.2
million EUR
investment volume

Market leader in Europe
since the 1970s.
Now:
worldwide



Perspectives of sustainability at TROX



Udo Jung
Managing Director of TROX GmbH

'Our efforts to promote sustainability are in line with a key value of our corporate policy, as well as with an important mega trend: health. Healthy people, thanks to good, clean air and a healthy environment. The many uncertainties of a year shaped by the coronavirus, highlight the true importance of this fundamental value and mega trend. This is why we think of sustainability as an opportunity for TROX to stand out as an employer and a solution provider.'



Thomas Mosbacher
Managing Director of TROX GmbH

'Consistent commitment to sustainability is essential for TROX. It is clearly the basis for continued success for our corporate group. A sustainable approach for the entire TROX GROUP gives us a competitive edge, helps us to reinforce our industry leadership in technology again and again, and it allows for an exemplary contribution to fighting climate change.'



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

'For a foundation, sustainability is by definition part of its very essence. It is therefore particularly fitting for a foundation-owned company such as TROX to define and practise sustainability as part of its corporate DNA.'



Peter Sønderskov
Managing Director of TROX Auranor, Norway

'For us from TROX Auranor in Norway, the construction of the first virtually climate-neutral production facility reflects how determined TROX is to address and implement sustainability. It shows what can be done, if you have the courage to do it. At the end of 2020, we even received an award as the year's most courageous company.'

Our development towards greater Sustainability

Our commitment to steadily expand our leadership role in the air conditioning and ventilation technology industry, while making the well-being of humans our first priority, is the motor that drives sustainability development at TROX. Comparing our first steps to the current status shows, how we successfully combined financial success with the protection of the environment and social, cultural and scientific involvement.

1951 Production of ventilation grilles is taken up in a 110 m² building in Neukirchen. This is where the brothers Friedrich and Heinrich Trox laid the foundations for the TROX GROUP which is now working internationally.



Now The new 13,330 m² TROX plant in Norway allows for virtually climate-neutral production.



1956 The first apprentice starts training in Neukirchen-Vluyn. The trainee sheet metal worker Erwin Haak was the first young person to undergo professional training at TROX.



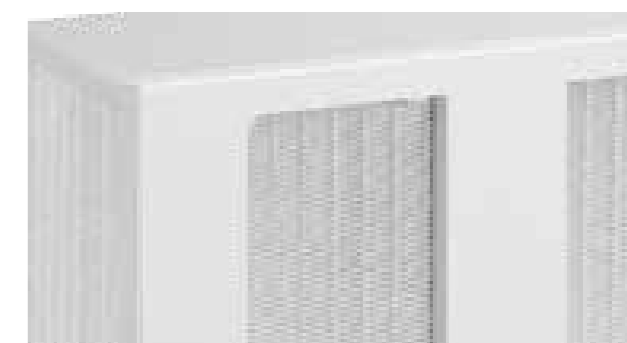
Now TROX encourages social awareness and involvement of its apprentices through programmes such as the Social Day.



1969 Air filters are added to the TROX production programme. TROX takes up filter production with the TROX-o-mat automatic roll filter units and pocket filters.



Now High-efficiency HEPA filters by TROX remove up to 99.95% of all viruses from the room air. This means that they also offer effective protection against the coronavirus in indoor areas, and help to create a healthier environment.



1991 The Heinz Trox Foundation is established. The non-profit foundation is the main shareholder of TROX GmbH and operates in line with its founder's motto: 'The human being is the yardstick, and people's well-being is our goal.'



Now Every year, the Heinz Trox Foundation supports social and cultural projects, as well as promoting scientific research on the issue of good indoor air quality.



2000 The first TROXNETCOM automation and communication system for safe control of fire prevention systems is installed.

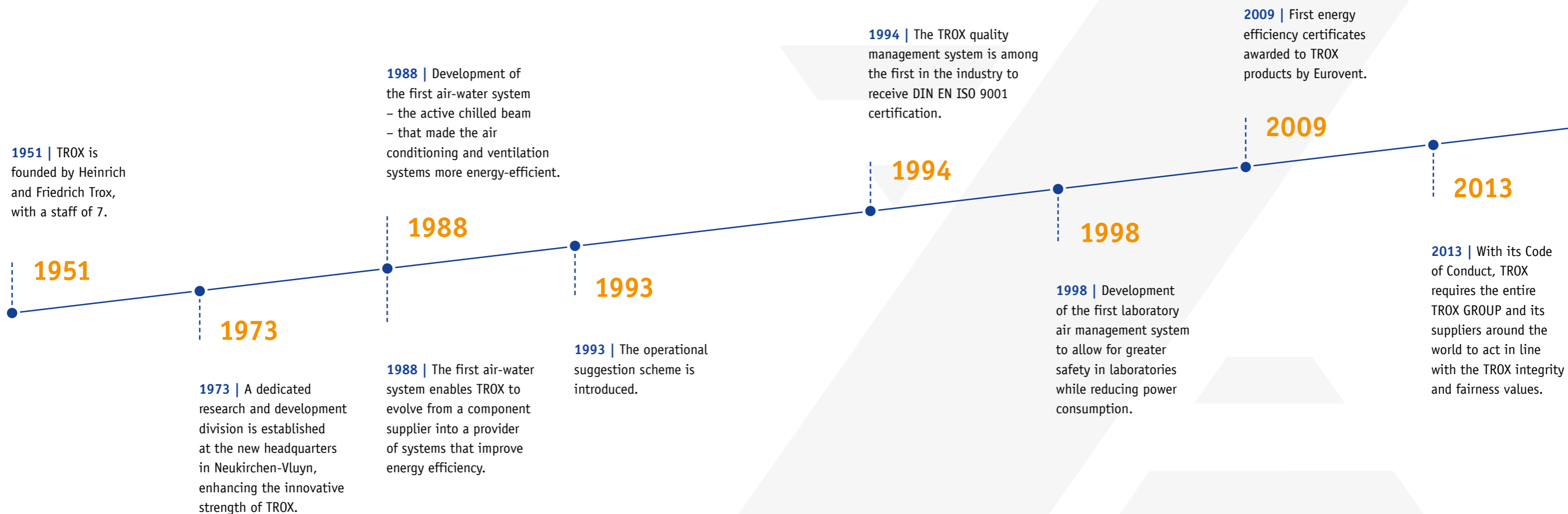


Now The first holistic system technology covering all air conditioning and ventilation components and the building control system is realised, ensuring safe and energy-efficient control of an air conditioning and ventilation system in a hospital.

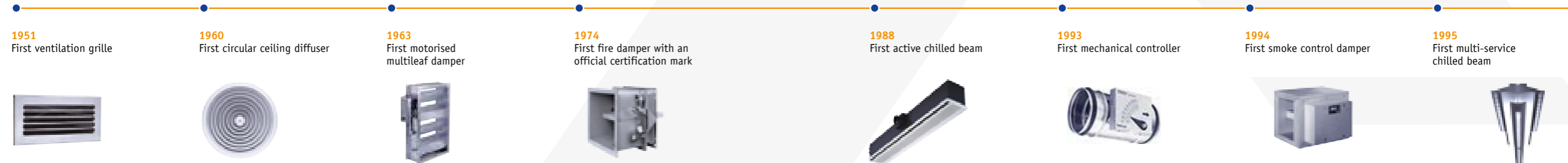


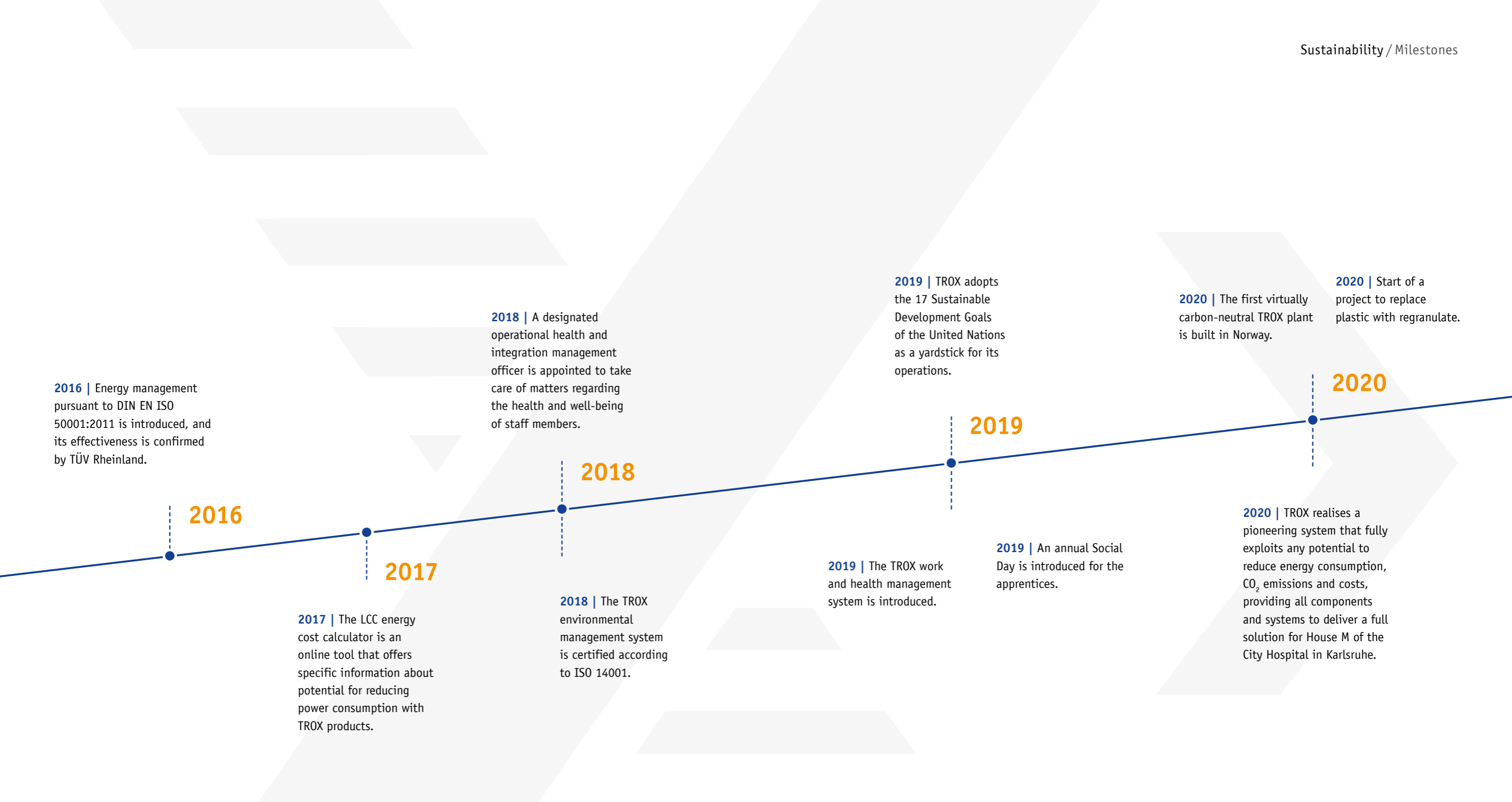
Sustainable thought and action since 1951

Throughout its corporate history, TROX has achieved many milestones in terms of sustainability development.

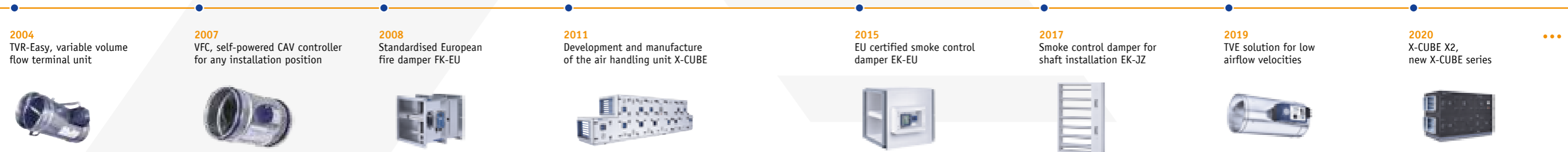


TROX's pioneer work in energy conservation





TROX's pioneer work in energy conservation



COVID-19.

Challenge
accepted!

COVID-19

Sustainability and COVID-19 at TROX

In line with its motto 'for indoor life quality', TROX has always focused on improving quality of life through fresh, healthy indoor air. The coronavirus pandemic has made this endeavour even more important around the world.

In the year 2020 that was characterised by the pandemic, TROX had to find ways to continue successful operation while also protecting people inside and outside the corporate group against infection.

Internally, we achieved a lot through social distancing, enabling staff members to work from home, reducing travel considerably, as well as through advanced digitisation concepts. Further measures included staggered shift changes and temporary plant closures, for example at the TROX branches in Argentina, China, Malaysia, Mexico, Spain and South Africa. While we were not able to prevent infections entirely, there were only a few individual cases across the entire TROX GROUP. At the same time, reduced travel activities at TROX GmbH alone, enabled us to reduce our CO₂ emissions by around 512 tonnes.

To keep our stakeholders up to date, we published videos on our website, in which all senior staff members of TROX GmbH answered questions regarding the pandemic that relate to their respective areas of responsibility. Our TROX Corona Ticker was introduced in March, and is used to inform our staff about the development of the pandemic, both globally and with regard to TROX on a bi-weekly basis.



THE HIGHLY EFFICIENT COMPONENTS AND SYSTEMS BY TROX MINIMISE THE RISK OF INFECTION WITH SARS-COV-2 IN INDOOR AREAS

We have also developed our energy data documentation concept further to allow for reliable comparisons, have streamlined certain processes to make them more sustainable, and have realised some modernisation projects. In pursuit of our goal to achieve climate-neutral operations across the entire TROX GROUP, we are converting our international production facilities analogous to the TROX Auranor site in Norway (see page 78). We have started this process at our production facility in Thetford (TROX UK). The paint plant there was optimised and the factory uses significantly less gas and electricity as a result. Further steps are planned and will be realised as soon as possible.

To ensure clean, healthy indoor air beyond the TROX premises, we designed the TROX air purifier within a very short time, and introduced it to the market. The stand-alone unit filters up to 99.95% of all viruses from the room air. It reflects our solution-oriented approach and is doing very well in the market (see page 51).

Furthermore, we have been supplying hospitals, clinics, treatment, testing and vaccination centres around the world with TROX components and systems for minimising the risk of a SARS-CoV-2 infection. The Spallanzani Hospital in Rome, where the first two COVID-19 patients were treated at the start of the pandemic, for example, has been equipped with highly efficient and effective TROX filters.



In addition to establishing the tried and tested high-quality ventilation components and developing into a system supplier, TROX also took a decisive step towards becoming a full-service provider in 2020. As a result, we have been able to remedy the interface issues between different systems in building automation, while speeding up construction, staying within budget, improving energy efficiency, reducing CO₂ emissions and saving resources (see page 55).

The issue of sustainability continues to be a top priority for TROX. We were not hindered by the COVID-19 pandemic in this regard. Quite the opposite is true, as it gave rise to new aspects that we can use to draw closer to our goal of a sustainable TROX GROUP.

TROX measures in the COVID-19 year of 2020

03/2020

- 1) Publication of three videos (coronavirus newsletters 1, 2, 3)
- 2) VDI publication on the topic: removing viruses from the air through filtration
- 3) Set-up of a COVID-19 landing page
- 4) Information about COVID-19 for our customers via the website (staff videos)
- 5) Various training measures (TROX ACADEMY)

04/2020

- 1) Publication of the fourth video (coronavirus newsletter 4)
- 2) Delivery of 24 X-CUBE AHU, as well as VAV and CAV devices to Sinopharm, a factory producing COVID-19 vaccine in Wuhan, China

06/2020

- 1) Initiation of the development of the air purifier

07/2020

- 1) VDI publication on the topic: removing viruses from the air through filtration

09/2020

- 1) Marketing launch for the air purifier
- 2) First internal TROX ACADEMY event

10/2020

- 1) First external event
- 2) Start of production of the air cleaner
- 3) VDI publication on the topic: VDI coronavirus FAQ
- 4) VDI publication on the topic: airing alone is not enough, focus topic: infection risks in schools

11/2020

- 1) EU production rollout for the air purifier

12/2020

- 1) Donation of an air purifier for the Caritas Nursing Home St. Helena, Zwiesel
- 2) VDMA publication Topic: Ventilation and air conditioning systems in the time of COVID-19, general information for operation and use

Climate-neutral by 2040!

We think of this ambition
as an opportunity.

2040!

OUR GOAL IS VERY CLEAR:
CLIMATE-NEUTRAL BY 2040!



Our goal is very ambitious indeed!

At TROX we believe that sustainability is the only option when it comes to paving the way for a future of economic prosperity and an ecologically intact environment for everyone.

We are convinced that a consistently sustainable approach will break down established structures, raise awareness, and ultimately lead to greater quality of living for us and for future generations, while also facilitating a productive future for our corporation.

Our goal is very clear: **climate-neutral by 2040!**

Sustainability is the result of many individual environmentally and socially responsible acts.

As the world's leading manufacturer of ventilation and air conditioning components, systems and solutions, we acknowledge our responsibility to actively contribute to a liveable future within the framework of our organisational capabilities. This is why we are designing increasingly resource-friendly processes, developing more and more energy-efficient products, and are interlinking systems and solutions ever more effectively.

With our TROX X-FIT+ programme we are defining clear internal goals regarding savings and an increase of efficiency. Through our committee work we are involved in defining future-oriented regional and global quality standards. We are also committed to fostering altruism, fairness and health within the TROX GROUP as well as in society.

Every single sustainable activity brings the TROX GROUP a step closer to our overall goal, and helps to protect nature and fight climate change.



Management and processes

To operate successfully and sustainably, TROX relies on transparency and clear guidelines.

Based on carefully structured procedures, responsibilities and control mechanisms, TROX has created a sustainability network that enables everyone involved to realise their intentions in a clear, transparent and feasible manner.

For this purpose, we have appointed a main coordinator for each of the six relevant fields of action: products, production, mobility and logistics, infrastructure, social matters and public relations. Ultimate responsibility lies with Udo Jung, the Managing Director of TROX GmbH. This concept allows for new impulses and processes that promote TROX's carbon neutrality across all divisions and allows for effective measures to contain COVID-19 within the group as well as in the market.

In addition to this, we have established a system for continuous improvement called TROXellence that systematically supports staff members in making operations more productive and humane, and therefore in working together more effectively. We use two standardised methods to achieve this: the TROX Production System (TPS, see page 62) and the TROX Administration System (TAS), both of which help to identify and harness potential. All measures and projects that are initiated here are listed and monitored in our TROX X-FIT+ programme.

Through our analyses, we ensure that all risks and opportunities are identified and the evaluations are used as a basis for future-oriented decision-making. The specialist departments stay in contact with each other in this context to guarantee transparent and trustworthy conduct.

This is where responsibility for our sustainability management's strategic orientation is found.



The TROX sustainability strategy

Visions of the future

Great visions give rise to great changes. With this in mind, we are adding sustainability to our corporate vision. reflects the high ambitions of our corporate group, when it comes to fighting climate change.

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. It is part of our everyday work and has long been part of all of our processes and considerations, and it shapes the future that we would like to live in.

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

SUSTAINABILITY STRATEGY



**From a vision to a mission
'for indoor life quality'**

Our development to become the industry's most sustainable business leads us inevitably to increasing our number of facilities to ensure access to clean, healthy air around the world. TROX thinks of fresh, healthy indoor air as the elixir of life. Good air equals good health. It represents well-being, safety and efficiency and improves the quality of life for human beings.

Everybody should have access to good air. TROX underpins this claim with smart ventilation and air conditioning systems that achieve a top level of climatic comfort, health promotion and resource preservation, while working safely, reliably and energy-efficiently. Through continuous development of improvements and innovations in the area of air conditioning and ventilation, we are able to deliver products that increasingly promote quality of living, while also contributing actively to climate protection.

Our motto is:

**'The human being is the yardstick,
and people's well-being is our goal.'**

The TROX values.

Values give rise to value.

Our mission to provide fresh, healthy air 'for indoor life quality' is guided by our motto 'the human being is the yardstick, and people's well-being is our goal'. This motto shapes our brand and the entire value chain of our products as well as the way we treat our staff.

This motto is considered in every decision and activity and it gives rise to the 5 TROX values: quality, reliability, safety, trust and sustainability.

Based on these corporate values, we have evolved as a reliable industry partner and have successfully combined innovative, highly efficient and sustainable solutions with authentic and fair interaction.



The TROX sustainability strategy



As a market-leading business, we are interested in economic growth, but not at any cost.

The main goal of our sustainable operations is to be successful in the long run, rather than maximising short-term profits.

Success

Sustainability is part of the very essence of TROX

The fundamental values of TROX GROUP are reflected by our endeavour to operate as sustainably as possible, alongside our dedication to quality, technology and design.

With his motto 'the human being is the yardstick, and people's well-being is our goal', Heinz Trox defined the direction in which TROX strives to develop. By founding the charitable Heinz Trox Foundation as the main shareholder of TROX GmbH in 1991, he manifested this philosophy. The fact that TROX is owned by a foundation, makes the company particularly sustainable.

It is true not only in Germany that foundation-owned companies usually survive for longer. After all, foundations tend to focus on the long-term perspective. The Heinz Trox Foundation is therefore not interested in short-term profit. Instead, it focuses on stability and a sound further development of the TROX Group.

We are dedicated to strengthening Germany as a business location, and wish to cement our pioneering role in Germany and increasingly also worldwide. We are particularly interested in people. To promote the well-being of humans is the key objective of the foundation and of TROX.

The issue of sustainability therefore shapes both the foundation and the company. This symbiosis makes for a crisis-proof structure.



TROX identifies with the 17 Sustainable Development Goals

With their 17 Sustainable Development Goals (SDG) published in 2015, the United Nations clearly defined how prosperity and the quality of living can be improved, while also preserving resources and the environment.

We consider the implementation of these international goals for sustainable development in our company an essential part of a comprehensive sustainability strategy.

SUSTAINABLE DEVELOPMENT GOALS



WE THINK OF THE 17 UN SDGS AS THE BASIS OF SUSTAINABLE OPERATIONS





TROX HAS ALWAYS BEEN PARTICULARLY COMMITTED TO 6 SDGS

Our line of work enables us to address 15 of the 17 SDG areas to contribute to making the world more sustainable. This includes goals 3, 8, 9 as well as 12, 13 and 17, which have always been top priorities for us:

3 GOOD HEALTH AND WELL-BEING



SDG 3 – Good health and well-being

The COVID-19 pandemic has highlighted the great importance of health protection. In line with Heinz Trox's motto 'the human being is the yardstick, and people's well-being is our goal', the 3rd UN goal has always been a decisive factor that is rooted firmly in our corporate DNA. We think of air as the elixir of life and our objective is to provide clean and health air to as many people as possible. We constantly question our resource-friendly product development procedures, the well-being of our staff members and of society at large, as well as the protection of our planet to realise improvements and to help reach this goal. At the end of the day, all of these aspects are beneficial to people and human health.

8 DECENT WORK AND ECONOMIC GROWTH



SDG 8 – Decent work and economic growth

TROX is represented in many countries, in which the company contributes to economic growth and employs staff members of many different nationalities. We attach great importance to fairness and integrity, and our ethical guidelines provide for respectful cooperation and equal opportunities, the elimination of risks and for individual advancement for our staff members.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



SDG 9 – Industry, innovation and infrastructure

Sustainably structured industry, sound infrastructure and innovations pave the way for social prosperity paired with environmental conservation. Thanks to numerous pioneering technology innovations, TROX is a trendsetter in developing highly efficient, durable technology and products that allow for up to 50% greater efficiency and have a direct impact on operational carbon emissions. In addition to this, we constantly adjust our production facilities and offices, as well as our infrastructure to allow for greater sustainability. Our new factory in Norway represents our endeavour to switch to virtually carbon-neutral production.

SDG 12 – Responsible consumption and production

Growing mountains of waste, fire clearing for beef farming and insufficient air and water pollution control due to outdated production facilities. SDG 12 is all about changing the ways in which we produce and consume goods, to allow for our planet's eco-system to regain its balance. We would like to provide all people with good indoor air in line with their requirements. We are equally committed to sustainable operation of the systems. Rather than focusing solely on optimising individual products, we consider the entire installation. This enables us to achieve more than the total of individual optimisations.

In addition to this, we invest not only in sustainable high-quality replacement and modernisation of our production processes and facilities. Strong awareness of the issue of sustainability is also part of our everyday operations at TROX: whether it be diligent waste sorting or a reduction of paper consumption and particulate emissions from printing.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



SDG 13 – Climate action

TROX has always been dedicated to optimising its products' energy consumption. This has allowed for a significant reduction of CO₂ emissions.

17 PARTNERSHIPS FOR THE GOALS



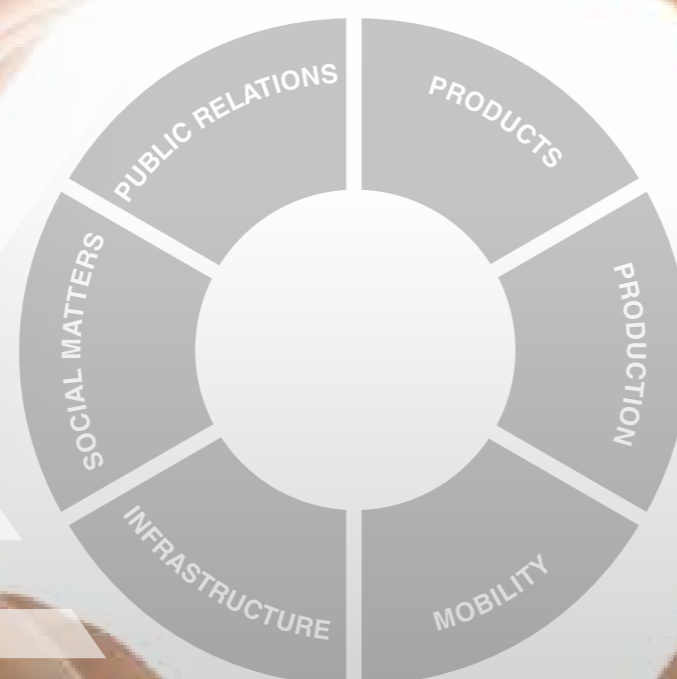
SDG 17 – Partnerships for the goals

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

The TROX fields of action

We turn goals into specific measures

Based on the 17 Sustainable Development Goals, we have defined six strategic fields of action for TROX, in which we are translating our visions of sustainability into specific measures.



FIELDS OF ACTION

Our attitude towards climate protection and what we want to achieve

To reach global climate protection goals, everybody has to contribute what they can, and we must never stop accepting new challenges.

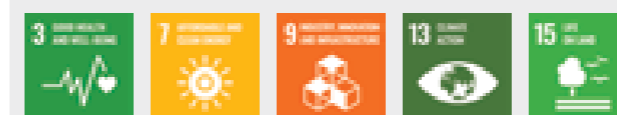
Our attitude in this area is expressed through the strategic sustainability goals that we have specified for each field of action, as well as in the measures we use to realise these goals. Our strategic and operational sustainability goals evolve constantly to cater for unexpected developments, such as the COVID-19 pandemic or technological advancement.



PRODUCTS

Our most important strategic goal is for everyone to live healthily in buildings with good indoor air. At the same time, we strive for our increasingly energy-efficient products to consume up to 50% less resources in real-life operation. To achieve this, we are implementing the following sustainability goals:

- We strive to develop and introduce products that minimise the risk of infection with the coronavirus.
- We intensify our association work to draw up guidelines and publications about the use of ventilation and our products with regard to infection protection.
- In addition to issues related to energy efficiency, we focus on the material side of our products, and strive to make full use of any opportunities to reduce resource consumption across the entire product life cycle.
- We increase the recyclability of our products and are working on a strategy for using materials (especially the different types of metal and plastic) in a more eco-friendly manner.
- We are drawing up a strategy for realising environmental documentation of our wide range of products in line with market requirements. The purpose of this documentation is to inform about energy consumption and climate-damaging emissions over the entire life cycle of our products, and to share any ideas for improving their environmental footprint.
- We optimise our products and systems across all loading scenarios, to allow for greater energy-efficiency in particular in the frequently occurring case of partial load operation.
- We offer single components, systems and 'one-stop shop' solutions, allowing for all ventilation and air conditioning technology including the related building automation equipment to work in an interface-optimised and highly energy-efficient manner.
- We steadily improve our products' efficiency, also with regard to air quality.



In the field of action 'products'
TROX contributes to realising these SDGs

PRODUCTION

Our strategic goal is to realise increasingly sustainable production processes around the world. To achieve this, we are implementing the following sustainability goals:

- We streamline production processes and optimise the material flow.
- We continue to develop TROX's integrated management system that covers the areas of quality, energy and environmental management, as well as work and health management.
- We invest in hardware and software components to ensure precise recording of energy data.
- We rely on the TROX production system, TPS, to improve to improve production and administration processes across the entire TROX GROUP.
- We use our energy audit system to improve the energy efficiency of investments.
- We optimise our staff members' working conditions continuously, and we record and remedy potential risks.
- We reduce scrap and waste.



In the field of action 'production'
TROX contributes to realising these SDGs

MOBILITY AND LOGISTICS

Our strategic goal is to decrease carbon emissions in logistics, transport and haulage, and to reduce packaging consumption. To achieve this, we are implementing the following sustainability goals:

- We optimise warehousing to reduce specific power consumption.
- We continue to expand our network of production facilities to be closer to our customers.
- We minimise transport by establishing new production and storage facilities.
- We pool transport for specific regions to allow for shorter delivery routes.
- We reduce resource consumption for packaging materials by using reusable transport packaging and are thus producing far less waste than is usually the case.
- We are gradually replacing our vehicle fleet with electric vehicles.



In the field of action 'mobility and logistics' TROX contributes to realising these SDGs

INFRASTRUCTURE

Our strategic goal is to steadily improve our environmental performance figures. To achieve this, we are implementing the following sustainability goals:

- We set up carbon-reduced or ideally carbon-neutral production in any new facilities, as in the case of TROX Auranor in Norway.
- We reduce primary energy and water consumption by investing into comprehensive building modernisation measures.
- We steadily develop our energy data recording hardware and software components to identify further measures to improve efficiency, and be able to assess the environmental performance of our processes more effectively.
- We improve our digitisation concepts to continue being able to operate digitally in a future-oriented manner, and to keep in touch even in times of COVID-19.



In the field of action 'infrastructure' TROX contributes to realising these SDGs

SOCIAL MATTERS

The entire TROX GROUP is dedicated to our corporate motto 'the human being is the yardstick, and people's well-being is our goal'. To achieve this, we are implementing the following sustainability goals:

- We invest in our staff members' safety, health and well-being at the workplace.
- We are aware of and appreciate 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.
- We improve the range of training and education opportunities available to our staff members, and create high-quality webinars that are easy to participate in.
- We promote gender equality and strive to increase the number of women in leadership positions.
- We promote our staff members' financial and social situation through fair pay around the world.
- We promote the implementation of our ethical guidelines around the world to ensure fairness, integrity and equal opportunities and fight corruption and discrimination.



In the field of action 'social matters' TROX contributes to realising these SDGs

PUBLIC RELATIONS

Our strategic goal is to establish TROX in the market as a sustainable company. To achieve this, we are implementing the following sustainability goals:

- We intensify our active leadership role and involvement in national and international associations, organisations and committees to realise sustainable standards and quality requirements, as well as specific environmental and energy targets for the building industry.
- We increase our communication with our stakeholders digitally, through print media and in the press to make our sustainability goals and measures transparent and comprehensive.
- We contribute to increasing online information and knowledge transfer on the issue of sustainability. To this end, we are going to explain topical and fundamental circumstances that are relevant to sustainability, such as in our videos about COVID-19 from the point of view of different divisions of TROX.



In the field of action 'public relations' TROX contributes to realising these SDGs

The six strategic fields of action
for realising our vision of sustainability:

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



In the year 2020 that was characterised by the coronavirus, the impact good air has on human health and well-being became apparent around the world.

By offering highly effective and energy-efficient products that ensure fresh, healthy indoor air, we are a part of the solution.

Products



Products

TROX products allow for healthy living conditions for all, also in times of COVID-19. We therefore contribute significantly to meeting the 3rd UN Sustainable Development Goal: 'Good health and well-being.'

TROX has been dedicated to the issue of good air for the past 70 years. Air is our medium and we think of it as the elixir of life that everybody should have access to in excellent quality. Clean air is a fundamental necessity, as it ensures our health and vitality.

In line with our mission statement 'the art of handling air – for indoor life quality', we have always focused on enabling people to feel good and be safe and healthy in indoor areas. The coronavirus pandemic has caused this mission to become ever more important around the world. Fresh indoor air has emerged as a global health factor that can minimise the risk of a SARS-CoV-2 infection.

The necessary room air conditions can only be ensured through mechanical ventilation. Due to structural and thermal conditions, the required exchange of air can rarely be achieved by opening windows. TROX has therefore seized the coronavirus crisis as an opportunity to position itself as a solution provider at the product level, offering highly efficient ventilation and air cleaning technology for effective protection.





focused, and reduces the number of days missed due to illness. Further sustainable advantages: SCHOOLAIR devices can be adjusted based on requirements and they heat the supplied fresh air to the desired temperature. Thanks to heat and moisture recovery, they only use half as much electricity as a typical laptop computer. This means that operating costs are reduced and classrooms are heated in an energy-efficient manner.

SCHOOLAIR devices are designed to allow for easy retro-fitting in classrooms: on an external wall, positioned vertically on the façade, or mounted to the ceiling.

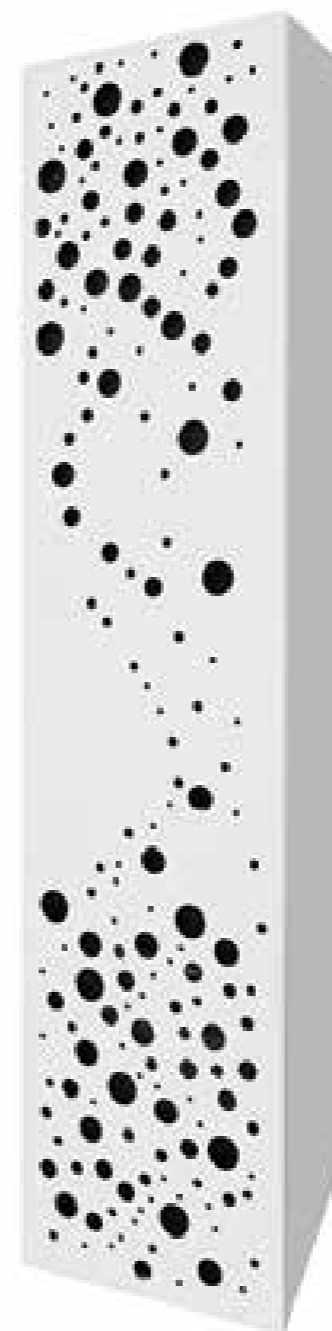
Marienfelde Primary School in Berlin, for example, has been equipped with the decentralised TROX ventilation units SCHOOLAIR-V-HE. Three devices per classroom that are conveniently installed on an external wall, ensure a pleasant room temperature at all times of year, while minimising outdoor noise, improving the students' performance, and effectively filtering any contaminants such as dust or pollen from the air (see page 104). In addition to this, the risk of a SARS-CoV-2 infection can be reduced considerably, owing to the fact that the room air is continuously diluted with fresh air.

With TROX SCHOOLAIR we are contributing significantly to meeting SDG 3 in schools, and we help to create suitable conditions for safe classroom teaching.

We want to avoid blanket shutdowns with clear reference values.

Thanks to our involvement in the industry's associations, we were able to help drawing up guidelines and publications about ventilation and our products in the time of a pandemic. This has enabled us to actively contribute to a definition of clear guidelines for assessing ventilation and air cleaning with regard to sufficient infection protection. These form the basis for sustainably safe school operation, as well as for opening businesses such as cinemas, restaurants or gyms based on TROX ventilation technology paired with social distancing and hygiene rules (see page 95).

TROX SCHOOLAIR ALLOWS FOR CLASSROOM TEACHING IN A GOOD, SAFE LEARNING CLIMATE AND AT A PLEASANT TEMPERATURE.



The TROX air purifier: flexible and effective in fighting airborne coronaviruses.

Our decades worth of experience in ventilation and our staff members' great commitment have enabled us to develop an air purifier very quickly, and to produce it in the TROX GROUP. We cooperated with experts from the areas of medicine, science, and ventilation and air conditioning technology to give this development a solid scientific foundation. Filtering 99.95% of all viruses from the room air quickly and reliably, TROX air purifiers can help to minimise the risk of an infection in any indoor areas without a mechanical ventilation system. The purifiers are also highly energy-efficient, using no more electricity than a 100 watt light bulb.

Unlike fresh air systems, no structural measures are required to use a TROX air purifier. It is simply set up and switched on. Studies have shown that this solution is highly effective. An indoor air purifier does not replace mechanical ventilation or opening windows, but is a suitable addition, for example, for filtering viruses from the room air between the ventilation intervals.

We therefore launched a safe and low-noise stand-alone solution in 2020 that ensures healthy indoor air, and can help to make our business and social life more normal once again. Blanket shutdowns of schools, restaurants, hotels, hair salons, gyms, etc. can be avoided as the risk of an infection is minimised.

In autumn 2020, TROX air purifiers were taken into operation in several classrooms of the Julius Stursberg Secondary School in Neukirchen-Vluyn. The number of days missed due to illness dropped by 80% compared to the year before. This shows quite impressively, how effectively our air purifiers can reduce the risk of contracting infectious diseases, as well as the impact that pure, healthy air has on the well-being and health of students and teachers.

Our specialised ventilation solutions for schools allow for classroom teaching and a better learning environment.

To expand our range of reliable solutions for minimising the risk of infection in classroom teaching, we developed a new decentralised ventilation unit in 2020. The device is part of our SCHOOLAIR series, and only minor structural changes are required to mount it to the ceiling. It enables schools and childcare facilities to combine a continuous supply of fresh air with ideal room temperatures and optimised virus protection.

The decentralised fresh air systems of the SCHOOLAIR line ensure a good and safe learning climate in all rooms, even when the windows are closed. Viruses are reliably removed from the room, along with the extracted air, and the carbon dioxide content of the room air is also reduced. The result is fresh air that helps students to stay

**TROX NANOWAVE®
ENERGY-SAVING FILTERS
REDUCE ENERGY COSTS
PER M³ OF PROCESSED AIR
BY 58% COMPARED TO
SYNTHETIC POCKET FILTERS**

Our filter technology provides for healthy air and significant energy savings.

We breathe 12,000 litres of air every day! Whether this air is fresh and clean, or contaminated with fine dust, viruses or bacteria has a verifiable impact on our health. This is why effective filtration technology is an essential part of our sustainability standards and our mission ‘for indoor life quality’.

With high-efficiency particulate air filters up to filter class U17, we ensure that aerosols, toxic dust, viruses and bacteria – particles on the submicrometre range in other words – are reliably filtered from the room air, also in sensitive areas such as clean rooms.

In addition, we are constantly working on making our filters ever more energy-efficient. The goal is to reduce the amount of power required by the fans in the ventilation and air conditioning systems to overcome the flow resistance of the particulate air filters installed. We have been very successful in this endeavour with our energy-saving NanoWave® filter.

Comparisons with regular synthetic pocket filters over the course of a year of use, showed that energy costs per cubic metre of processed air were around 58% lower, and overall costs were found to be around 51% lower, despite 50% higher acquisition costs. This corresponds to a significant reduction of primary energy consumption that our customers and the environment can benefit from in equal measures.



With our patented radio-based TROX RadioDuct, we now allow for easier CO₂ reductions in existing buildings.

Refurbishment of old ventilation and air conditioning systems gives rise to great sustainability potential. There are around 600,000 ventilation and air conditioning systems in Germany alone, which do not operate based on demand and are therefore inefficient and harmful to the climate. In a survey conducted by the RWTH Aachen, it was found that between 50 and 70% of all systems operate in a manner that is not ideal.

We cooperated with FH Aachen, RWTH Aachen and BFT Planung GmbH to develop TROX RadioDuct: a cable-free control and communication solution that allows for simple and highly energy-efficient upgrading of old systems. This does not require any great effort or high investments.

THE PATENTED DEMAND-BASED CONTROL TECHNOLOGY RADIODUCT THAT CAN BE RETROFITTED EASILY AND AT LOW COST, CONSUMES 30% LESS ENERGY AND REDUCES CO₂ EMISSIONS CONSIDERABLY

Potential to reduce CO₂ emissions by optimising fan control using TROX RadioDuct in Germany

	Electrical energy consumed by ventilation	CO ₂ emissions
Before optimisation	21,000 TWh/a	12,726,000 t CO ₂ -eq/a
After optimisation	20,580 TWh/a	12,471,000 t CO ₂ -eq/a
Reduction	420 GWh/a	255,000 t CO₂-eq/a

The calculation is based on the assumption that 10% of existing systems are modernised or replaced a year, and that 20% of the systems modernised are converted to allow for demand-based control.

Analyses carried out by research institutes show that the refurbishment of existing systems with RadioDuct offers a savings potential of 255,000 t CO₂-eq/a in Germany alone.

This shows very clearly that demand-oriented control technology has a great impact on the climate. After all, this type of modern control systems can reduce energy consumption by 30% on average. This makes RadioDuct the perfect solution, especially when upgrading existing buildings in a climate-friendly manner.

We can save even more primary energy by integrating our components into a system or an all-round solution.

Big projects such as hospitals or office buildings require complex coordination of many different ventilation and air conditioning components. We have been offering perfect interconnection of our components in systems with demand-based room regulation for a while now. These networked systems allow for far more precise adjustment to the current energy demand. As a result, they do not only allow for greater energy efficiency and productivity and a pleasant atmosphere, but carbon emissions are also reduced.

THE REDUCTION OF CARBON EMISSIONS OF PROJECTS REALISED WITH DEMAND-BASED CONTROL BY TROX HAS INCREASED TEN-FOLD SINCE 2019

Calculation of CO₂ reduction for projects with demand-based ventilation in 2020

Basic data		
Total volume flow rate of systems with demand-based ventilation per airflow direction	m ³ /h	4,153,600
Increase of pressure of the supply air fan	Pa	900
Increase of pressure of the extract air fan	Pa	700
Average overall efficiency of the fans	%	65
Performance and energy calculation		
Electrical output supply air fans	kW	1,598
Electrical output extract air fans	kW	1,243
Weeks in operation per year	weeks	52
Days in operation per week	days	7
Hours in operation per day	hours	12
Hours in operation per year	hours	4,368
Overall electrical output of the fans	kW	2,841
Overall annual electric energy demand of the fans	kWh/yr	12,409,488
Energy savings and CO ₂ reduction		
Average energy savings from using a system with demand-based control (efficiency class A according to DIN EN 15232)	%	55
Annual reduction of electrical energy consumption	kWh/yr	6,825,218
CO ₂ e emission per kWh	kg CO ₂ e/kWh	0.474
CO₂e emissions avoided per year	t CO₂e/a	3,235

Calculated based on the CO₂ emissions from air transport (electricity used by the fans) of all systems delivered by TROX in 2020 that are equipped with comprehensive demand-based control.

In 2020, we took the next step. We realised a perfectly aligned tailor-made all-round solution that includes the entire building technology and automation system. Everything from a single source.

This all-round solution has an enormous advantage: interfaces are minimised, making it quicker and cheaper to realise, as well as safer across all processes and more sustainable, too. This concept where planning, realisation, control and support are all provided by the same source is extremely energy-efficient by design. Via comprehensive logistics planning, it also allows for travel and transport routes to be pooled, which provides for a further reduction of CO₂ emissions.

The coordinators responsible for the refurbishment of House M of the City Hospital in Karlsruhe that was taken up in 2020, chose our all-round solution. They are fully satisfied with the technology, processes and services (see page 102).

All products and systems listed here are examples of the TROX product management, in which the entire life cycle of a product is considered and taken into account with regard to sustainability. This starts with the development of designs that require less materials and will increase efficiency. We also keep working on the issue of recycling.

In addition to their exemplary energy-efficiency, TROX products are appreciated for their high quality, durability and functionality. This is confirmed by our customers: in recognition of our honest, reliable and steady interaction, TROX received the Trustworthiness Award of the LüKK (ventilation, air conditioning and cooling industry) in April 2020.

TROX BUILDING SERVICES AND AUTOMATION



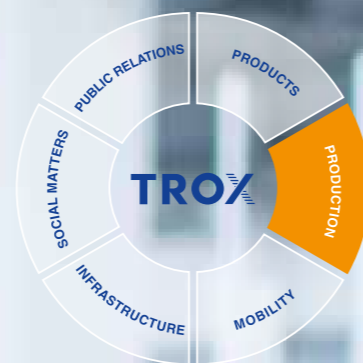
- > Reliability
- > Planning reliability
- > Appointment reliability
- > Reliability in the supply chain
- > Calculability
- > Cost savings



Sustainable production processes protect human beings and resources.

This is why we choose to invest into better and more sustainable production facilities, and expect sustainable processes from our suppliers, too.

Production



Production

To ensure climate-friendly production, TROX relies on sustainability and resource conservation in its processes, as well as when replacing facilities.

TROX wants to be involved in designing future production standards, and to contribute significantly to the goal of climate neutrality. This means that we want production using state-of-the-art technology to minimise energy and resource consumption, as well as a pleasant and safe working environment. We also want suppliers to demonstrate their commitment to sustainability. To realise this at TROX, we are reviewing, planning and implementing suitable optimisation measures across the group.

We systematically increase sustainability at our TROX production facilities in Germany.

We use the integrated management system of the TROX GmbH to make our production more and more sustainable over the years. The system covers the areas of quality, energy and environmental management, as well as work and health management. Clearly defined action and measure plans that are supplemented with internal system and process audits, are in place for all areas.

A key focus area of our measures to promote sustainability is a considerate use of resources. We believe that resource-friendly machinery technology is a decisive factor for achieving climate neutrality at TROX, and therefore also for our business success. This is why we systematically invest in state-of-the-art machinery that enables us to meet the rising demand for our top quality products efficiently and sustainably, also in the future.

In the area of surface coating at our factory in Neukirchen-Vluyn, for example, we have replaced the entire powder application system (powder booth, control system, cyclone, filter) with a system using the latest dense phase conveying technology and upstream robotics. Thanks to the new powder booth that is designed to facilitate quick colour changes, we are now able to react to our customers' colour requests faster and more flexibly – and we also save about 3 tonnes of special paint every year. This means that it is an investment that provides for greater efficiency as well as for material savings and therefore for resource conservation.



DUE TO INVESTMENTS INTO ADVANCED MACHINERY IN 2020, TROX GMBH SAVES 3 TONNES OF SPECIAL PAINT PER YEAR, PRODUCES 50% LESS WASTE AND SAVES ENERGY, TOO

A new panel-sizing saw with an automatic suction crossbeam for loading the saw has been installed at the component production department of the factory in Anholt. A waste optimisation system is used to nest the panels to reduce waste. Thanks to additional smart scrap use, partly used panels are stored and automatically used for future orders. As a result, there is 50% less waste than was the case with the old system and resource consumption is reduced.

Precious resources are also conserved through our investment into a new punching and bending line for ventilation and air conditioning systems. The latest hybrid technology for forming processes is used in the line that comprises a material store and a fully automated punching and bending unit. The result: less energy is needed for the same level of productivity.



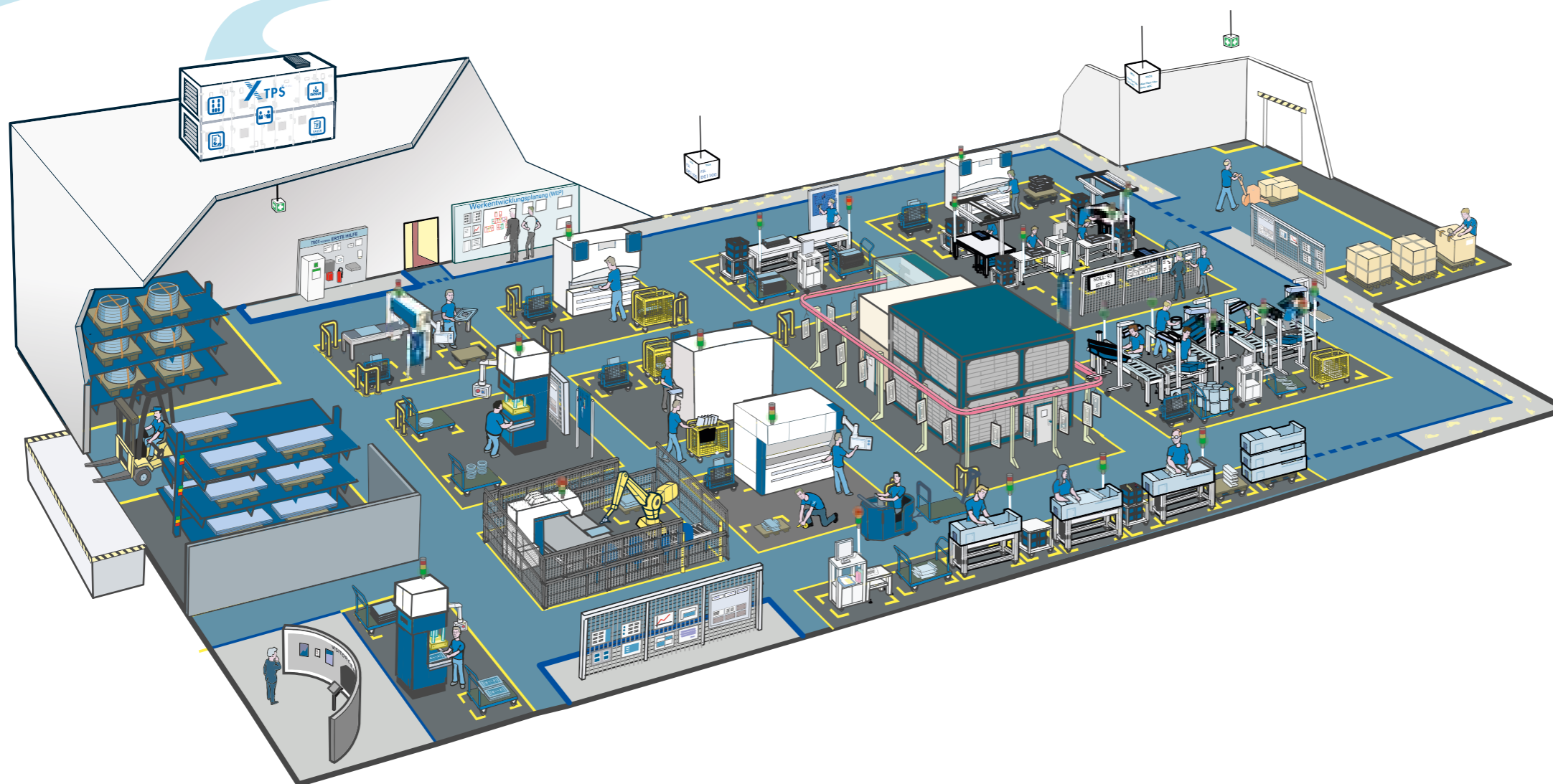
In 2020 we drew up plans for further sustainable technology optimisations, such as a short tube system that links rounding, welding and tube finishing in a compact finishing line. We expect to save more than 34,000 kg of CO₂ per year here.

We are also going to convert further international production facilities of the TROX GROUP to allow for sustainable operations as has been realised with TROX Auranor in Norway (see page 78). The paint plant at our factory in Thetford (TROX UK), for example, has been optimised and the factory uses significantly less gas and electricity as a result.



Calculated CO₂ savings for the new short tube system

Decrease of power demand	20 kW
Scheduled machine hours per year	4,500 h
Power-on time	80%
CO ₂ emissions	0.474 kg/kWh
CO ₂ savings	34,128 kg/yr



We are making operations at all TROX production facilities worldwide more sustainable, using the TROX production system TPS.

With the TROX production system TPS, we have created a set of rules that 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. It is intended for coordinating the structures and organisation of the 19 TROX GROUP production sites around the globe, to allow for production processes and administrative activities to be improved continuously, and to further promote sustainable development. An international TPS training session with the 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. Regular video conferences allow for comprehensive exchange regarding the implementation and progress at the individual factories. Outstanding ideas and implementations are also documented in the TPS Best Practice Handbook. Thanks to digital media, closer and more frequent collaboration between the different production facilities could be observed, despite the current pandemic situation.

Reducing or avoiding production waste – another way to preserve valuable resources.

Examples such as the new waste reducing panel-sizing saw and automatic storage of usable panels show how raw materials can be saved effectively.

Through comprehensive investment in advanced machinery, we have generally been able to reduce production waste.

We place high sustainability demands on our suppliers and the area of goods purchasing.

Our sustainability assessment of the entire value chain also includes our suppliers. We pay particular attention to ensuring that they fulfil the social, ethical and environmental standards that we are committed to. With our Code of Conduct, our suppliers around the world undertake to act in line with the TROX values of integrity and fairness. This means that human and children's rights must be respected, all kinds of discrimination must be ruled out, safe and healthy working conditions must be promoted, but also that laws with regard to environmental protection must be observed and any processes that are harmful to the environment must be minimised. These obligations also apply for any subcontractors of our suppliers.

The Code of Conduct is accepted by all suppliers, and in the past, TROX has also accepted its suppliers' existing codes of conduct. To monitor compliance even more effectively, we are going to implement a purchasing tool that requires our suppliers to disclose detailed information. If the data provided is insufficient, unclear or inconsistent, we will review the situation diligently. We may choose to stop placing orders with suppliers with poor sustainability ranking. Furthermore, we use a tool called 'riskmethods' to check, for example, whether any TROX suppliers are included in a sanctions list.

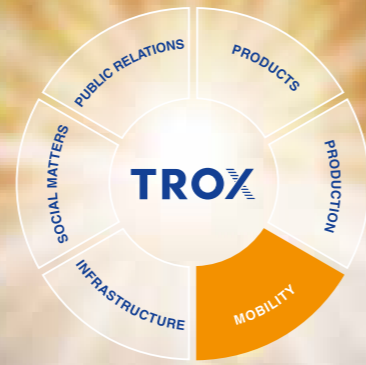
The tool is also a holistic supply chain risk management solution that enables TROX to identify any risks along the supply chain, to assess the extent of damage and to take appropriate measures. Risk potential is detected early on, so the ability to supply is maintained and compliance is ensured, and any threats to the corporate image can be avoided.

We choose this approach to make sure that our sustainability measures are effective along the entire value chain. This also includes goods purchasing. In this area, we investigate in advance, whether any dangerous substances of materials are used and if responsible procurement can be guaranteed.

Tomorrow's logistics concepts are characterised by short routes and innovative transport ideas.

To achieve a positive ecobalance, we like to consider new mobility and logistics methods. We also develop projects whose effectiveness we check in pilot projects.

Mobility
and
logistics



Mobility and logistics

In the field of action 'mobility and logistics', we primarily focus on reducing carbon emissions and packaging materials.

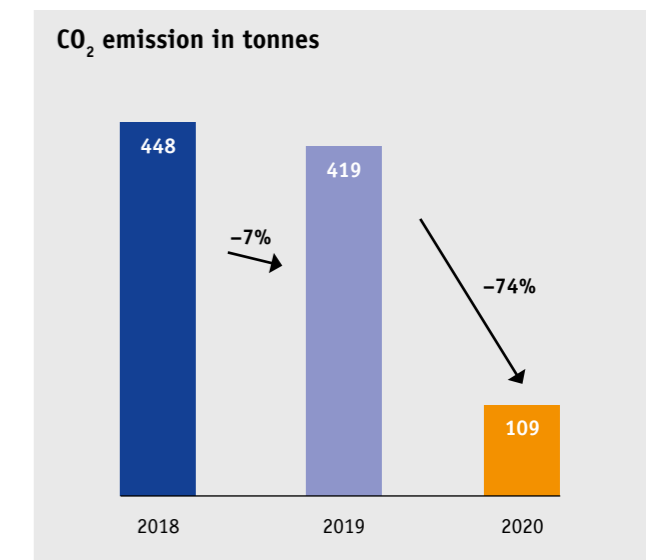
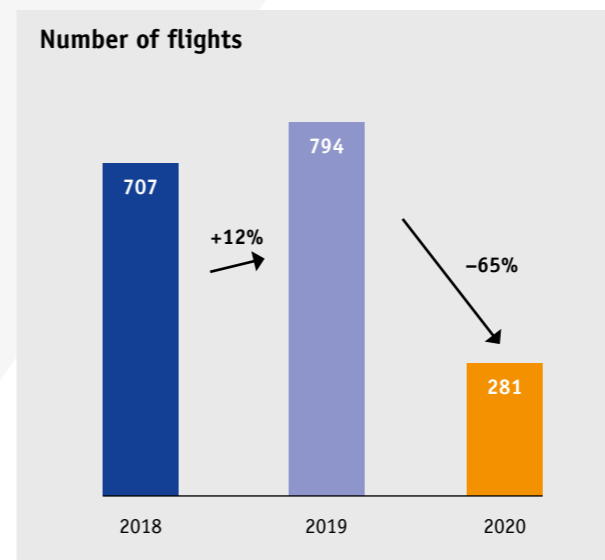
To this end, we draw up new concepts and we look into ways to avoid unnecessary travel, pool transport and allow for shorter routes. We also rethink packaging to save resources.

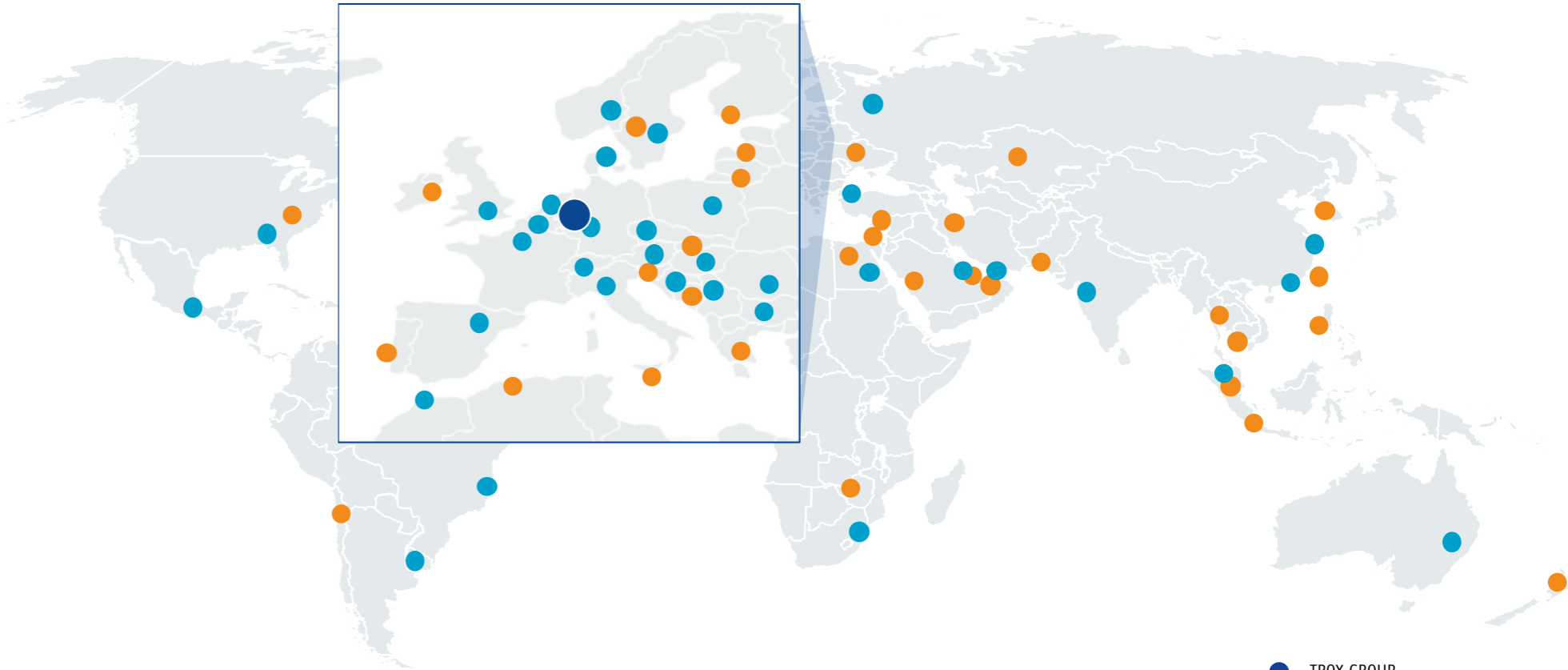
The reduction of travel due to COVID-19 shows what is possible.

Before the coronavirus pandemic, personal contact was considered to be of utmost importance. TROX had been set up well with regard to digitisation to begin with. When social distancing requirements occurred, we were able to adjust and expand these capacities quickly and effectively. This enabled us to stay close to customers, business partners and colleagues also in the pandemic year of 2020, without needing to travel and thus produce CO₂ emissions. It is now clear that once things are back to normal, not every meeting will take place in person.



Flights and CO₂ emissions of TROX GmbH





Fuel consumption for our vehicles had been steadily decreasing even before the COVID-19 pandemic. This decline was due to the fact that we take care to replace vehicles with models that consume less fuel, and that we have been able to reduce the distances travelled through improved planning and coordination. Furthermore, we have meanwhile bought our first electric and hybrid cars.

In 2020 we were able to significantly improve our environmental footprint compared to 2019: 310 tonnes less CO₂ thanks to less air travel, and another 202 tonnes less CO₂ due to reduced fuel consumption. 40,960 trees would be needed to bind this amount of CO₂ per year (80 trees/tonne of CO₂). This is a step towards climate neutrality that we would like to pursue further.



BY REDUCING OUR TRAVEL ACTIVITIES IN 2020, WE PRODUCED 512 TONNES LESS CO₂ THAN IN THE YEAR BEFORE. THIS CORRESPONDS TO THE COMPENSATION PERFORMANCE OF 40,960 TREES.

Petrol and diesel consumption for travel activities of TROX GmbH

	2017	2018	2019	2020
Litres	274,086	247,082	214,750	138,223
kWh	2,523,520	2,396,143	2,080,944	1,335,843
Litre/EUR 1 million in revenues	570	496	403	268
kWh/EUR 1 million in revenues	5,246	4,812	3,904	2,589

19 production sites around the world enable us to be close to our customers.

TROX pursues a decentralisation strategy. In 2020, we expanded our network of production facilities around the world to 19 sites. This enables us to produce and deliver in close proximity to our customers. Delivery times, transport distances and related CO₂ emissions are reduced as a result.

Pooling transport to reduce the number of kilometres travelled.

When planning transport, we pool deliveries whenever possible. Combining transport routes depending on the region allows for shorter delivery times and transport distances as well as lower CO₂ emissions.



We also reduce CO₂ emissions through our choice of carriers.

Their extended transport and storage network enables us to react spontaneously and to generate storage options close to our customers, rather than returning loads over long distances. Our carriers also ensure that lorries are always used to their full capacity, avoiding journeys without load and lost return loads.

For a portion of our TROX air cleaner transports, we chose a carrier with an intermodal network across Europe, who was able to shift from road to rail for most of the route. With GLS Germany, TROX GmbH has selected a parcel shipper that offsets its CO₂ emissions from transport by

investing into an externally certified forest conservation and reforestation project. We therefore keep CO₂ emissions as low as possible.

Our finished goods warehouse project – with a service provider that operates sustainably.

In cooperation with one of our service providers, we have established a finished goods warehouse for standard items, from which we can serve our customers around the world. We attached great importance to choosing a service provider who is also dedicated to sustainability. Not only did this provider impress us with buildings that are equipped with solar systems and a Euro 6 standard vehicle fleet, but they also cooperate with us to actively minimise outer packaging, thus avoiding that packaging waste is produced in the first place. We have already achieved a considerable reduction of waste, by introducing standardised sales units. To promote sustainability film packaging, for example, is only used if explicitly requested by a customer.

We are going to continue to drive this progress forward. As planned in 2020, a logistics specification sheet will be introduced in 2021, in which packaging guidelines are clearly defined with a particular focus on recyclability of packaging materials.



The semi-finished goods pilot project at the Anholt site.

The aim of this project is to increase the number of products with very fast availability from stock, and to achieve beneficial effects such as smoothing out production and saving primary energy. The drawn up processes are tested in the pilot project and their effect on the market is determined. The experiences gained will be used to develop the finished goods warehouse further. This enables us to create future-oriented solutions that improve customer satisfaction levels, allow for shorter and more reliable delivery periods for custom orders, and to contribute to climate protection.

We take sustainability into account for future logistics concepts, too.

To develop our logistics area in a future-proof manner, we have set ourselves the long-term goal to realise further measures to promote sustainability. This includes synergies between the areas of transport and storage logistics, also with regard to international operations.

In recent years, we have therefore analysed the logistics processes of all of our European sites, collected and evaluated the results, and then worked out possible scenarios for a European TROX logistics centre. Planning is almost complete but we have not specified a starting date yet.

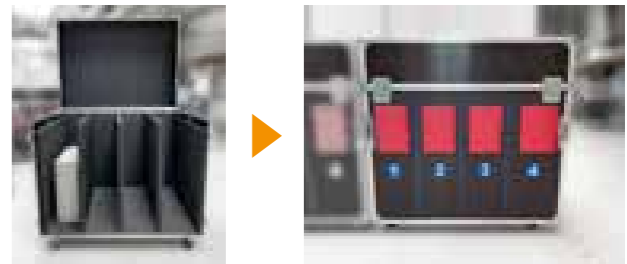
By establishing the European logistics centre, we want to significantly reduce our transport and logistics efforts. Planning provides for central storage of finished and semi-finished goods to allow for delivery chains to be pooled, and for shipments to be taken to our customers as quickly as possible. In addition, manual efforts are reduced thanks to digital tools. We expect this to give rise to quick response times and increased transparency for us and our customers, and ultimately far lower CO₂ emissions.

Transport packaging designed for multiple use.

To be able to transport our products safely and still avoid packaging waste on site, we are increasingly opting for reusable transport packaging.

Our first step were the sturdy, tailor-made wooden transport boxes for the TROX SKYBEAMS, that were folded up and returned to us for the next delivery. Specially designed transport boxes also allow for our switch cabinets to be rolled to their point of use. There is no need for the usual packaging materials such as film, ratchet straps or special pallets. Once the boxes are empty, they are simply returned to us.

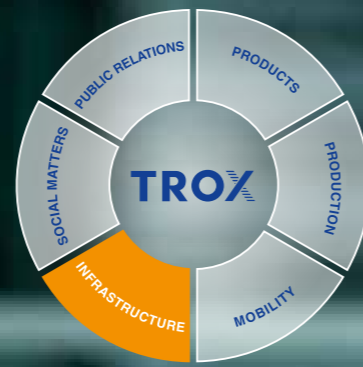
This enables us to use less material, avoid waste and to ensure safe transport of our products.



Sustainable infrastructure is essential for achieving climate neutrality by 2040.

We rely on progress – from data capture through to effective CO₂ reduction.

Infrastructure



Infrastructure

To improve sustainability in the field of action 'infrastructure', we harness the potential of saving energy and water, of resource-friendly waste management and future-oriented digitisation.

Each step towards increased sustainability is a step towards climate neutrality. This is why we continuously improve the quality and completeness of our data and have added additional data types and data capture locations in 2020. While we still have to estimate or derive a few CO₂ calculation factors, the values do show that CO₂ emissions have been significantly reduced. The figures are backed up by our decreasing operating costs.

It was found in the internal environmental assessment for TROX GmbH that CO₂ emissions had at first glance increased by around 6.8% over the reference period from 2015 to 2020. However, closer inspection (t/invoice amounts) showed a reduction, as sales had increased by 19%.

CO₂ emissions of TROX GmbH

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

CO₂ emissions of the TROX GROUP

TROX GROUP	2015	2016	2017	2018	2019	2020
CO ₂ emissions (t)	16,099	16,180	15,815	16,257	15,711	15,993
CO ₂ emissions (t) per million euros invoiced	33.1	34.3	32.4	32.1	29.0	30.4
Change (%)						-8.0

Amounts invoiced include net proceeds from production and goods trading. Deviations from the TROX Sustainability Report 2019 are due to improved data capture and the integration of additional data.

Legend:

Between 2015 and 2020, TROX GmbH has reduced its CO₂ emissions by 11.2% from 29 to 25.7 tonnes per 1 million euros invoiced.

We invest into sustainable CO₂-reducing technology.

In the context of the integrated management system, TROX introduced energy management in line with DIN EN ISO 50001:2011 in 2016. The system's effectiveness was confirmed by TÜV Rheinland in the same year. Immediate consequences: improved eco-awareness of our staff, identification of specific saving opportunities and the initiation of measures.

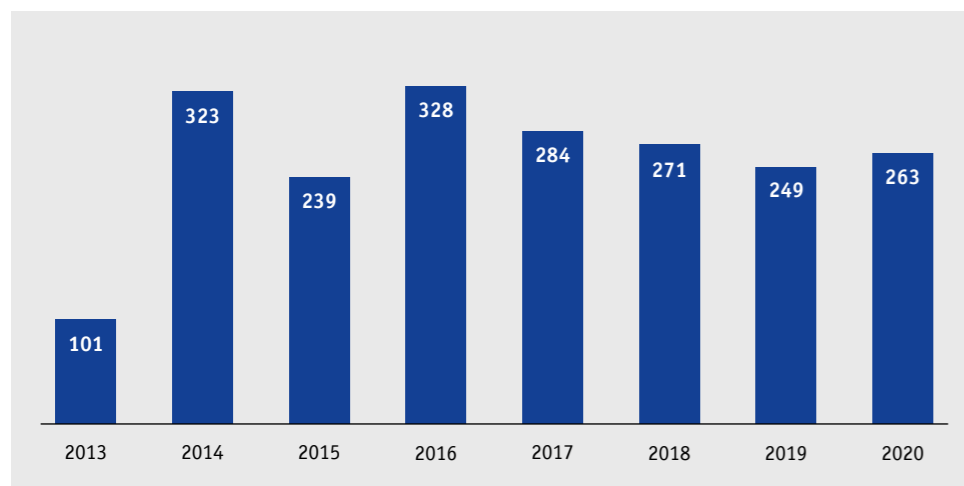
When the new headquarters for TROX GmbH were built in Neukirchen-Vluyn, a geothermal heat pump and ground loop field were installed for heating and cooling. The geothermal heat pump system alone has saved 263,000 kWh (81%) of primary energy in 2020, compared to conventional heating and cooling by means of a natural gas furnace and cooling unit. This corresponds to a reduction of CO₂ emissions by 50 tonnes (78%).

A total of 2,058 MWh (2,058,000 kWh) of primary energy were saved thanks to the geothermal heat pump system since monitoring was taken up in mid-2013, and CO₂ emissions were reduced by 396 tonnes.

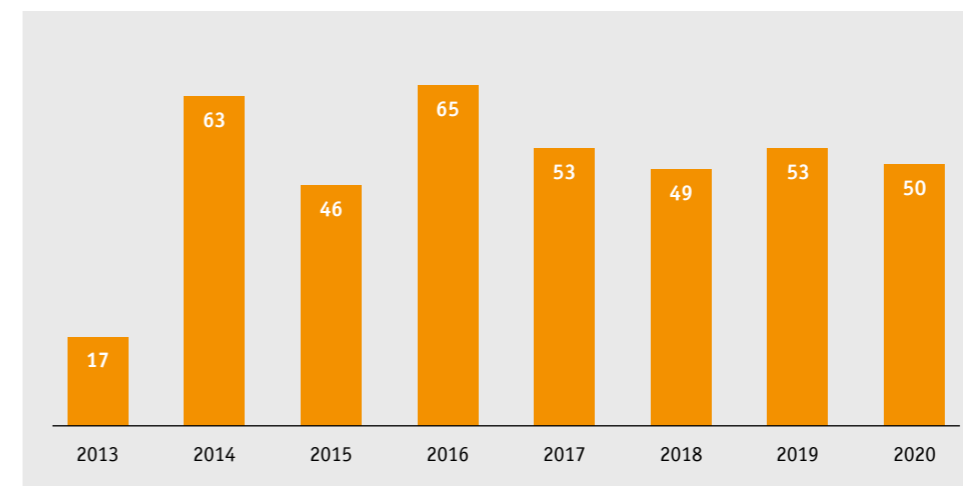
In addition to procuring our first electric and hybrid cars, we have established charging stations for electric cars in Germany and in the Czech Republic. We have thus entered the field of electric mobility in 2020, and are going to gradually expand our activities here.



Primary energy savings (MWh/yr)



CO₂ reduction (t/yr)





THE NEW TROX FACTORY
IN NORWAY HAS BEEN
WORKING VIRTUALLY
100% CLIMATE-NEUTRALLY
SINCE DAY ONE



Virtually climate-neutral from day one – our factory in Norway.

Construction of TROX Auranor, our new production facility in Norway that produces almost 100% carbon-neutrally, was nearly completed in 2020.

The factory uses energy generated from 100% renewable water power. In addition, all light sources are equipped with energy-efficient LED solutions. There are 50 charging stations for the electric vehicle fleet on the premises. Highly efficient tools, devices and systems by TROX are used here, alongside innovative digitisation instruments.

In a sophisticated and highly competitive selection process, TROX Auranor was chosen as an exceptional example of entrepreneurial courage and received the 'Næringsmot 2020' award (which means business courage) in November 2020. The following three criteria were key here:

- TROX Auranor is well rooted in the local community and also a national and international player.
- TROX Auranor is an excellent employer, currently with 170 permanent employees.
- TROX Auranor contributes to a positive and courageous corporate culture through continuous investment in its own operations and development.

Taking up operations at TROX Auranor, we are proud of our courageous approach to implementing climate protection.



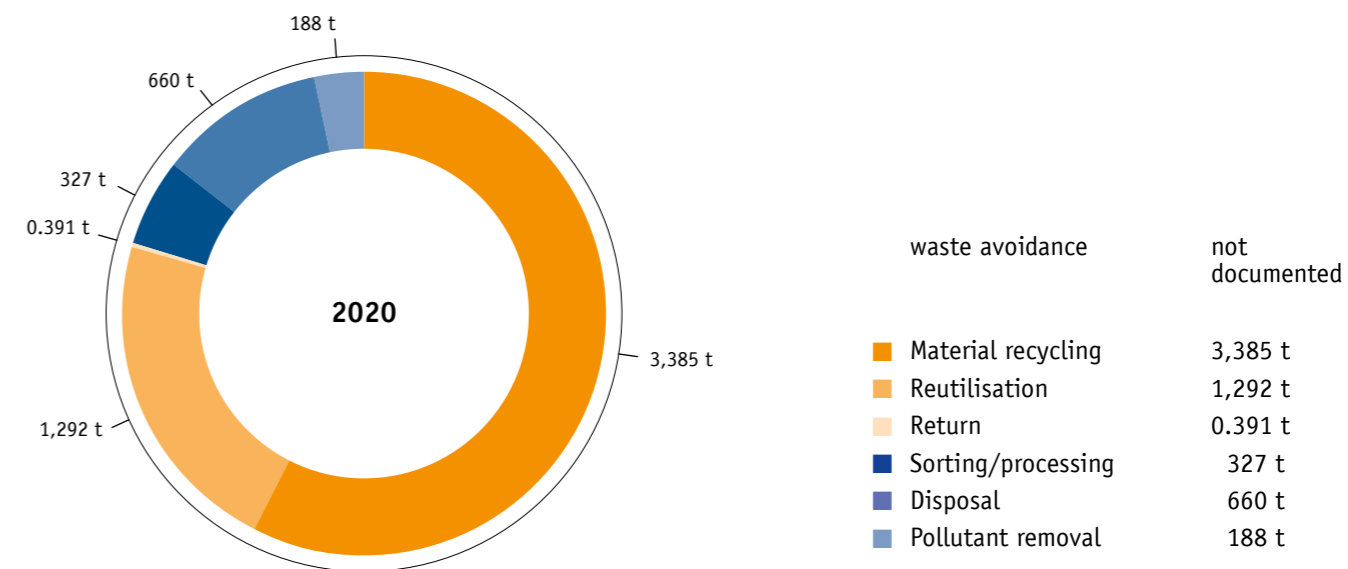


We think of waste as valuable raw materials.

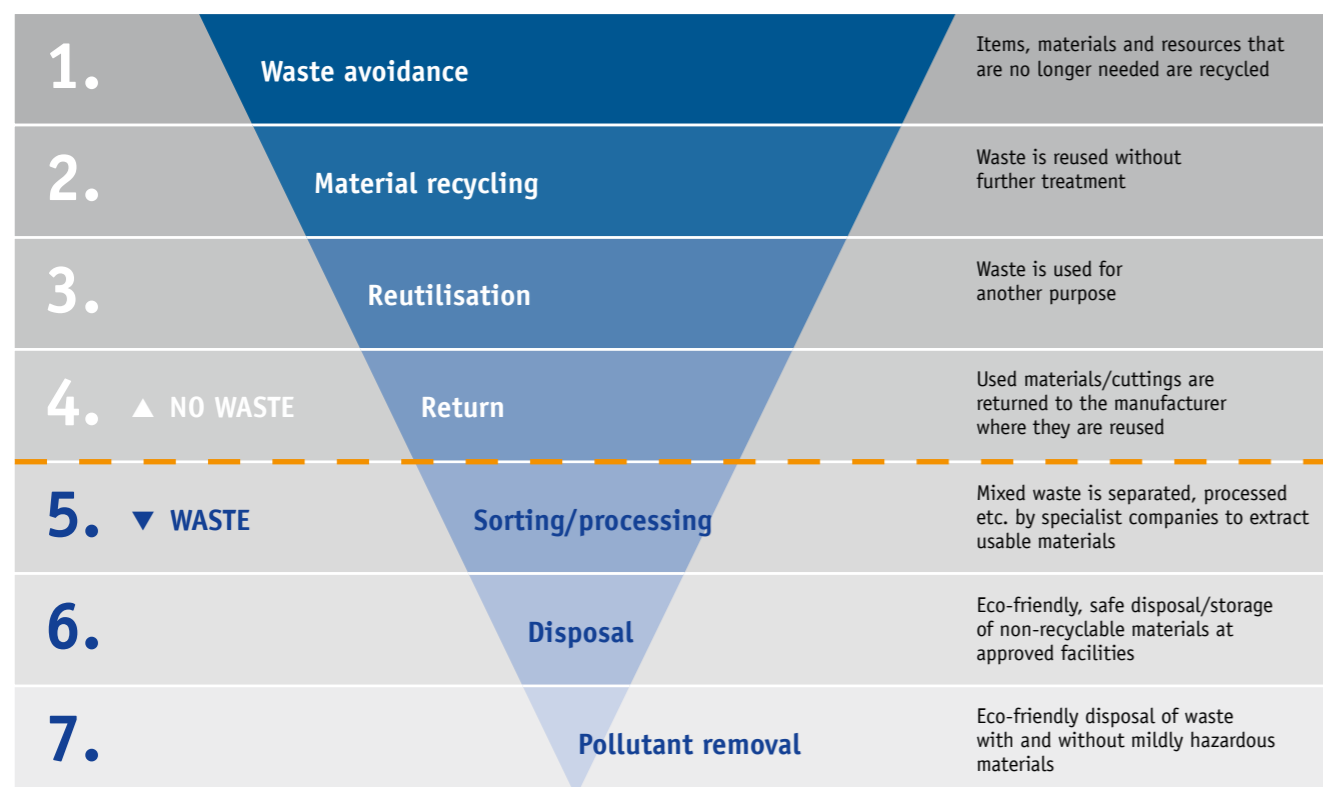
Waste avoidance, recycling, reutilisation, processing or responsible disposal: we want to help protect our world's resources. Our declared goal is to avoid waste entirely, wherever possible. This approach has an impact even in product planning.

Where waste is produced nevertheless, we strive to return such materials and energy to the economic cycle through recycling measures. TROX also uses sophisticated technology by German waste-management companies to convert waste into a usable resource and to dispose of any residual waste in an eco-friendly manner.

Waste generated by TROX GmbH



The TROX waste hierarchy



OUR PRIMARY GOAL IS TO AVOID WASTE

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 are setting a good example for digitisation.

We addressed the mega trend of digitisation early on at TROX and have made it part of our corporate structures. The development of our web-based customer portal myTROX and the online shop, for example, will enable our customers to receive all product and order information in digital form in the medium term. This means that we will need less paper and fewer on-site appointments of technical staff.

Expanding our digital services via the customer portal myTROX gives rise to further benefits with regard to sustainability. By means of remote access, it is possible to monitor systems in operation around the clock. This includes efficiency monitoring, analyses, control and maintenance. Our customers are granted access to cloud-based solutions in the context of these remote monitoring services.

The digital services do not only enable us to reduce the number of journeys for servicing, they also allow for more energy-efficient operation of ventilation and air conditioning systems.

The coronavirus pandemic prompted us to realise various digitisation projects far sooner than planned, as well as to initiate many additional projects. One example is that MS Teams was introduced in the context of our **TROX Digital Organisation Initiative**, making collaboration far easier. The company and the staff members quickly switched to mobile work, which enabled us to comply with social

distancing requirements, and still have meetings and get our work done. The result: we will continue to benefit from this progress in the future and CO₂ emissions will therefore be reduced on the long run.

Another example is our new **Corporate Model** that generates more consistent goods supply for TROX around the world. Our steadily increasing number of production and storage facilities is making this digitisation tool particularly important for climate protection, because it ultimately enables us to cut not only transport costs but also transport routes and CO₂ emissions.



Online factory acceptance testing is another sustainable development that replaces travel and personal contact and thus reduces CO₂ emissions. The so-called FAT procedure is the acceptance of devices by customers at the production facility, checking all performance criteria. If requested by our customers, these tests are performed at TROX before delivery.

In times of COVID-19, these approval procedures have been increasingly taking place online, as has been the case for a TROX UK project in London. All measurements were filmed live and explained in a video conference, and the current measurement data from the measuring computer was captured and streamed in real time. The acoustics measurements were also transmitted live.

Everyone involved agreed: online factory acceptance testing is a true alternative to in-person appointments on site. A perfect way to contribute to climate protection.

In consideration of our products' entire value chain, we have introduced **Agile PLM** (Product Lifecycle Management) as a digital solution that makes our development projects more transparent. In the long run, this technology can help to identify certain types of material even in the development phase and encourage sustainable projects.

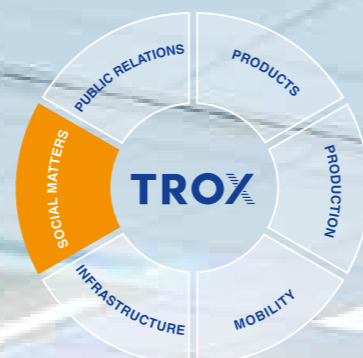


Digitisation is among the mega trends of this day and age. Concepts that make current and future operations easier for our customers and for TROX, and that allow for healthy interaction, enable us to work more sustainably and ensure future success for the TROX GROUP.

Our staff members contribute to the realisation of our sustainability goals and our business success every day.

Offering our staff a working environment that is inspiring, encourages dedication and makes them feel safe and comfortable is our heartfelt desire.

Social matters



Social matters

Our motto 'the human being is the yardstick, and people's well-being is our goal' has characterised our interaction at TROX like never before in the year 2020 that was shaped by the pandemic.

Our top priority at TROX is to protect human beings and the environment. The issue of health has gained significance since the start of the COVID-19 pandemic. We have therefore been focusing on our staff members' health, and have developed a working environment in which well-being, safety, advancement and education are endorsed. Working together is key in all our endeavours. It goes without saying that we closely cooperate with our staff members to realise sustainability in the field of action 'social matters'.

Working safely and staying healthy: an outstanding example of constructive cooperation.

To minimise health risks posed by the coronavirus, strict social distancing rules and compulsory face masks were introduced early on, across the entire TROX GROUP. While a few staff members caught the illness in the context of the pandemic, we have succeeded in preventing any significant spread. We took measures where needed and, for example, closed down some factories temporarily or reduced production.

It was in part thanks to a strict approach that an extensive spread of infection could be prevented: we immediately instructed any individuals who tested positive to quarantine, identified any contact persons, who also quarantined depending on the duration and form of contact, and did not allow these staff members to return to work until they had tested negative at the end of the quarantine period.

OUR CORONA TASKFORCE HAS TAKEN VARIOUS MEASURES TO EFFECTIVELY MINIMISE THE RISK OF INFECTION AT TROX

Together with our staff we drew up this and further hygiene concepts, held national and international meetings online via MS Teams, and implemented remote working within a very short time.

The Corona Taskforce has been active at TROX GmbH since March 2020. Measures for minimising the risk of infection at TROX have been developed on a weekly basis. These include:

- Staggered shifts at the factories to prevent contact
- Remote working wherever possible
- Setting up the ventilation systems to provide the greatest possible share of fresh air
- Bi-weekly coronavirus ticker, keeping all staff members in Germany and abroad up to date with information about the spread of aerosols, effective ventilation solutions, and the internal situation
- Acrylic glass screens between desks
- Works agreement for temporary measures to avoid short-time work
- Introduction of negative time accounts
- Testing opportunities at a local laboratory in case of a suspicion or uncertainty due to contact
- Distribution of masks by TROX
- Closure of the cafeteria
- Acquisition of digital systems, laptops, headsets and microphones
- Increase of broadband capacity

Thanks to our staff, all measures taken to date were implemented quickly, safely and in a target-oriented, constructive manner. The goal was to avoid or reduce any related health or financial burden. We are proud and thankful for this dedication. After all, TROX would not be what it is today without the support of its staff. Their dedication and expertise are the key to mastering this difficult time that is so far from normality.



We promote our staff members' potential and commitment, as well as their well-being.

Happy staff members are vital if we want to reach our business and sustainability goals. We therefore strive to motivate and encourage everyone, to offer advancement opportunities and job security and to promote our staff members' health.

- The TROX **work and health management** that was introduced in 2019 focusses intensely on our staff members' needs and provides for various measures. This includes that we cooperate to identify and address potential stress areas.
- Based on a solid training concept that includes part-time options, we **encourage professional development and promote talent**. 78 young people participated in an apprenticeship with TROX in Germany in 2020. In addition, there are numerous interns, working students and graduates working on their final project at TROX.

In 2020 we set up the FutureLab for our trainees, a workshop at which they were able to conduct independent research and development work over a period of several months. Their task: to develop a commercial virtual reality (VR) application. The result: an impressive virtual reality environment in which

products such as the TROX air purifier, future fire dampers and new accessories can be touched, lifted up, opened, taken apart and installed. This enables us to work on our products together with our customers and partners from afar, without needing to travel. Users can zoom in and out as they wish and choose to see the bigger picture as well as small details.

Owing to the coronavirus pandemic, not all training sessions for our staff members could take place as planned. However, we were able to compensate for a large share of these by expanding our digital learning content. This situation has given rise to positive effects that we are going to seize as an opportunity to develop blended learning further, and combine traditional classroom teaching and e-learning in the future. TROX provided more than EUR 400,000 for staff and management training in 2020.

- Our specific **work-life balance offerings** are intended to make working at TROX as pleasant as possible. We offer flexible solutions, in order to take the increased retirement age into account. These range from semi-retirement, via an early reduction of working hours, through to the option to work beyond the usual retirement age.

Cases of corruption	2015	2016	2017	2018	2019	2020
Number of cases in which staff members were dismissed or other disciplinary measures were taken due to corruption.	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

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 designated operational health and integration management officer has been arranging individually coordinated measures to promote our staff members' health and well-being since 2018.

- We are committed to fair treatment of our staff members, regardless of their gender, nationality or religious affiliation. Our **ethical fairness and integrity guidelines** ensure equal opportunities for our staff members, they safeguard the dignity of all human beings and provide for the prevention of discrimination and corruption.

It is not only against this backdrop that we are very pleased about the fact that the share of female staff members and managers has increased once again in our technology-dominated company.

- We consider fair and good pay and ideal working conditions 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 6.9%, TROX is far below this average. Our staff members currently stay with us for 12.2 years on average.





WE HAVE BEEN ABLE TO INCREASE ONLINE LEARNING OPPORTUNITIES FROM THE TROX ACADEMY BY 113%, COMPARED TO THE YEAR BEFORE



The TROX ACADEMY is becoming more and more digitised.

Customers and staff members can obtain important knowledge and skills at the TROX ACADEMY that enable them to work productively in the ventilation and air conditioning industry and to enjoy their work. A trend towards digital teaching showed even in 2019. Because of the coronavirus pandemic, we quickly expanded the online offerings of the TROX ACADEMY in 2020. As a result we have been able to train and inform even more participants than before.

TROX ACADEMY online and classroom teaching

	2019	2020	Difference
Total number of events	160	106	-34%
Online events	30	64	+113%
Classroom-based events	130	42	-68%

	2019	2020	Difference
Total number of participants	3,661	4,215	+15%
Total number of participants in online events	850	3,470	+308%
Number of participants in internal online events	364	1,731	+376%
Number of participants in external online events	486	1,739	+258%
Total number of participants in classroom-based events	2,811	745	-73%
Number of participants in internal classroom-based events	283	0	-100%
Number of participants in external classroom-based events	2,528	745	-71%

Social performance factors at the TROX GROUP

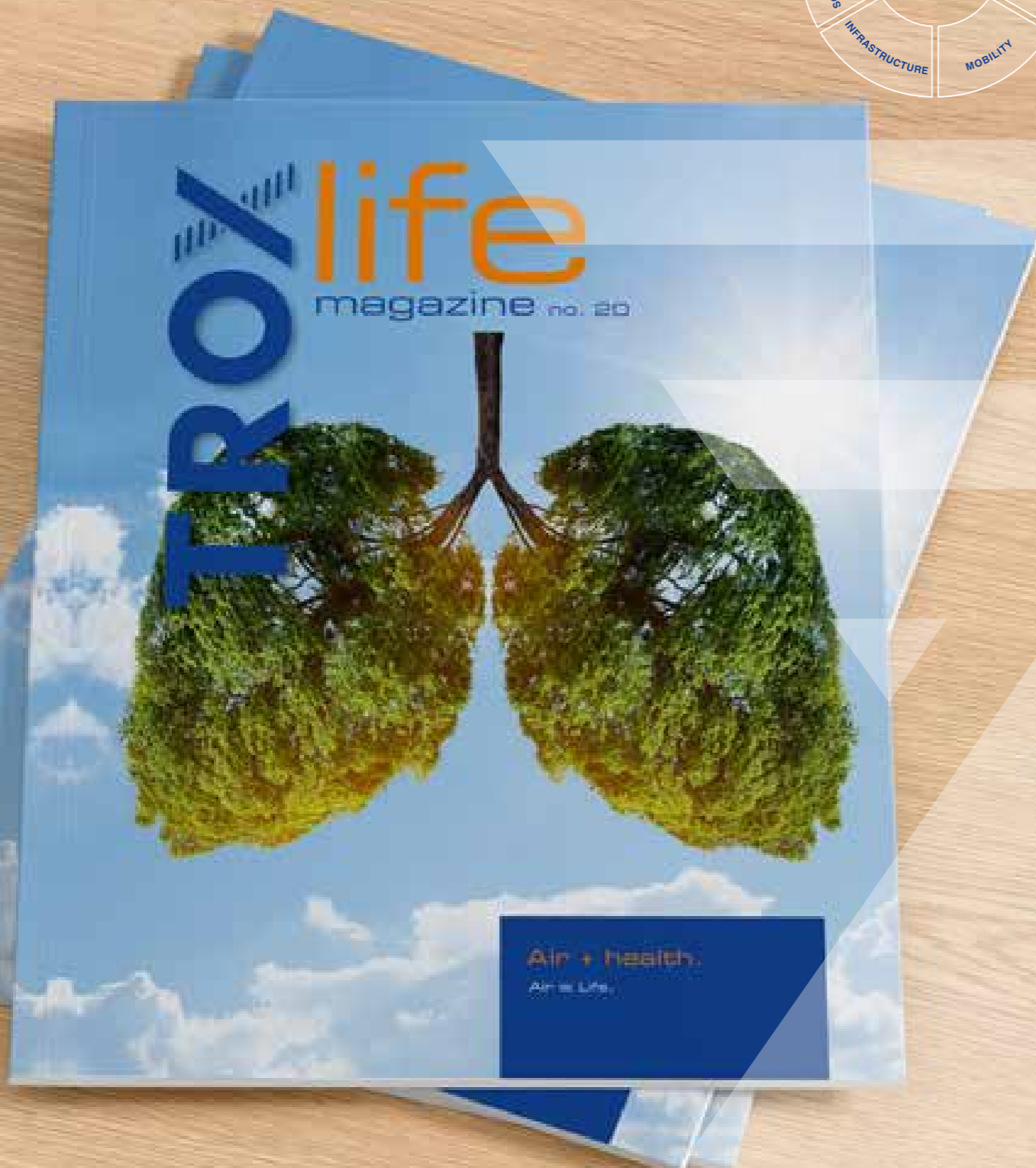
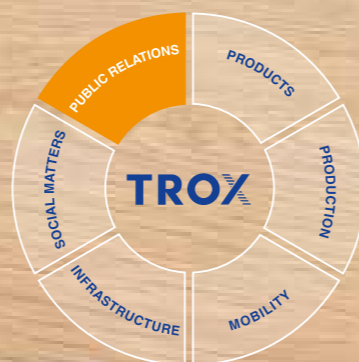
	2018	2019	2020
Number of staff members	3,789	4,007	4,316
Staff turnover rate (%)	7.6	7.8	6.9
Average age (years)	39.0	39.3	41.8
Average period of employment (years)	13.0	12.7	12.2
Number of permanently employed staff members	3,474	3,681	3,960
Number of part-time staff members	244	284	214
Number of positions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

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

Public relations

Sustainability
needs a voice.

We are involved in the relevant industry associations, where we successfully advocate for greater awareness and higher standards for healthy indoor air.



Public relations

As a global company, we are committed to external communication of relevant issues related to sustainability in Germany and globally.

We are actively involved in the relevant associations, organisations and committees of our industry, because we want to establish regulations, guidelines and laws that promote a liveable future. We are dedicated to putting specified environmental and energy targets into practise, to quality standards that make for future-ready, energy-efficient and sustainable building technology, and right now to TROX' core area of expertise: highly efficient ventilation and air conditioning technology for healthy indoor air.

Our close cooperation with the research sphere and leading industry associations allows for clarity during the coronavirus crisis.

Public interest in clean room air is currently greater than ever before. Fresh, virus-free air is key to staying healthy, after all. As a leading expert for air conditioning and ventilation technology, we have cooperated closely with researchers and associations to find solutions that produce measurable results and allow for a valid assessment of infection risks. And it was a success.

The ways in which coronaviruses spread and accumulate in the room air via aerosols, and how the risk of infection can be minimised with suitable air conditioners was identified clearly.

Direction for handling COVID-19 is meanwhile indicated in guidelines and recommendations from recognised specialist associations such as REHVA (Federation of European Heating, Ventilation and Air Conditioning Associations), BTGA (Bundesindustrieverband Technische Gebäudeausrüstung e. V.) and VDI (Verein Deutscher Ingenieure).

In its 52nd status report dedicated to the issue 'ventilation and air cleaning requirements for reducing the risk of airborne infection: social distancing, hygiene measures, face coverings and ventilation', the umbrella association for air conditioning (FGK, Fachverband Gebäude-Klima e. V.) explains an approach that allows for assessment, and therefore for indoor areas to be used in line with infection protection requirements. The VDMA (Verband Deutscher Maschinen- und Anlagenbau e. V.) – the German engineering association and Europe's biggest networking organisation – also supports this approach.

TROX HELPS TO MINIMISE THE RISK OF INFECTION IN INDOOR AREAS IN A SCIENTIFICALLY SOUND MANNER

It allows for precise calculations for minimising the infection risk in relation to the room size, and blanket closures of restaurants, schools, gyms, theatres, etc. can be avoided. The concept provides for three options for a 100 square metre restaurant for 50 people with an existing ventilation system supplying 2,000 m³ of outside air an hour, to ensure sufficient infection protection based on ventilation technology and provided that the general rules (distance, hygiene, face coverings) are complied with:

- Capacity reduction to 32 people
- Increase of the air supply to 2,808 m³/h
- Additional air cleaner with H13 filter and a volume flow rate of 808 m³/h

The FGK approach can be used to determine the options for infection protection based on ventilation technology for any room.

The connection between fresh air supply, the activity factor and the number of people with regard to the risk of infection is documented in a study by our research partner RWTH Aachen. They found that the highest level of protection is provided by an automatic ventilation system supplying a high share of fresh air, while simply opening windows is clearly not enough. In the same study, it was found that another good way to reduce the risk of infection is to combine suitably sized air cleaners that can be easily set up with periodic and draught ventilation.



Our cooperation with these recognised specialist associations and research players has helped to establish bases that can be picked up by policy-makers and allow for healthy indoor interaction around the world.

We are communicating openly and promptly.

We are dedicated to transparent, comprehensive and factual information and communication. We do not wish to raise expectations we cannot meet but to provide sound and valid information. As a reliable partner in anything we say and do. We do not think of communication as a one-way street, but as interaction with our customers, business partners, staff members and friends. To stay in touch, we use video interviews, email newsletters, social media and ACADEMY events. Instead of attending trade fairs, we visited our wholesalers with our TROX road truck in 2020. Our communication style has a considerable impact on our company's structure and development.

In this time of the coronavirus, we keep our staff up to date about the goings-on at TROX via our Corona Ticker. For our customers, we publish videos on our homepage to inform them about issues related to the pandemic. We stay in contact with our shareholders and creditors via online supervisory board meetings, as well as online banking newsletters and talks. In general it can be said that our operations are becoming more and more digitised.

However, we still make a point to use print media, too, as a conscious means to slow down in this hectic day and age. 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. This is what makes communication sustainable in our opinion.

In publications such as the TROX life magazine, we therefore explore social and topical issues such as 'climate and change' or 'sustainability' in a way that is both scientific and entertaining.



ON SOCIAL DAY, THE TROX APPRENTICES GET ACTIVE TO PROMOTE SUSTAINABILITY



We want to realise sustainability, also in our neighbourhood.

We keep the stakeholders in our vicinity informed about TROX on a regular basis and arrange for activities related to sustainability, such as our apprentices' Social Day. The goal of this annual event is to raise our apprentices' awareness of the different areas of sustainable action.

On 29 November 2020, the apprentices and their supervisors from Anholt, Bad Hersfeld and Neukirchen-Vluyn volunteered outdoors for the second time. Based on the motto 'everybody is talking about sustainability – we want to get active', they painted fences, cleaned nesting boxes and cleared away dead wood together with the local groups of the nationwide nature conservation organisation NABU.

Summary

Our goal:
climate-neutral operations
by 2040, paired with
sustainable qualitative
and quantitative growth.

To this end, we are finding
solutions that take current
events such as the COVID-19
pandemic into account, as
well as sustainable product
development and human
well-being.

TROX creates sustainable solutions

Our approach to sustainability is based on the coexistence of human beings and the economy on behalf of a liveable future.

The coronavirus crisis gave rise to new challenges for TROX, too. We seized the crisis as an opportunity and our sustainability measures for 2020 were based on the objective to develop effective solutions as an employer as well as a provider of highly efficient ventilation and air conditioning technology.

We have adopted the 17 Sustainable Development Goals specified by the United Nations. Taking the pandemic into account, we have aligned our activities to focus on SDG 3 'good health and well-being', and on developing energy-saving technologies that minimise the risk of infection. We have also made progress in the areas of resource conservation and environmental protection.

In close cooperation with the scientific sphere and leading industry associations, we were able to draw up solutions for minimising the risk of infection in indoor areas and protecting human health. Fresh, healthy indoor air is our key area of expertise after all, and in times of COVID-19 it is an issue of utmost importance. This is why our sustainability efforts in 2020 were all about developing and implementing effective solutions that promote human health and well-being – with sophisticated measures and highly efficient, as well as energy and resource-saving technology.

Six fields of action for tangible sustainability management.

To be able to reach our sustainability goal to operate climate-neutrally by 2040, we consistently draw up sustainable measures for our six decisive fields of action. Clearly structured responsibility levels and comprehensive analysis and reporting processes ensure that we can work in a targeted and effective manner and based on reliable data. In 2020 we invested more than ever before. The biggest share of these EUR 50.2 million were used for strategic measures that will help us to achieve climate neutrality. A good example is the EUR 30 million investment for building our factory in Norway that operates almost 100% climate-neutrally.

People come first.

In line with our approach to sustainability, we make human beings and their well-being our top priority in all of our endeavours. We are dedicated to making a significant contribution to enabling future generations to live healthily, and to ensuring good air for everybody, regardless of time and place. Based on this spirit, our dedicated staff members have worked hard to help secure a future in which healthy interaction is possible, and everybody can benefit from economic wealth and an ecologically intact environment. The perfect way to put our motto into practice: 'the human being is the yardstick, and people's well-being is our goal.'



2040

Sustainable projects by TROX

During the operation phase of buildings equipped by and with TROX, it becomes apparent how effective building technology can be in saving energy and reducing CO₂ emissions. TROX has always been pioneering in this regard.

House M at the City Hospital in Karlsruhe.

For the first time in our corporate history, TROX was in charge of all aspects of air conditioning and ventilation technology, including heat recovery and fire and smoke protection. Our services ranged from planning support, via sizing and configuration, through to electronics, integration into the central building management systems (BMS), through to approval of the system and system control.

Interface issues were the reason that TROX decided to develop sophisticated solutions for air management and to think in terms of a complete ventilation and air conditioning sub-system. The result created for House M is a tailor-made, perfectly coordinated end-to-end central building management technology and automation solution from a single source. Customers, specialist consultants, HVAC contractors and operators can benefit from some decisive advantages: fewer interfaces, quicker realisation and lower costs, as well as greater security.

21,000 square metre big House M is supplied with outside air, using particularly energy-efficient TROX X-CUBE air handling units. In addition, a TROX hydraulic unit, which includes special RAC control, ensures heat recovery with an efficiency of up to 80%.

The installed and perfectly networked TROX technology at House M of the City Hospital in Karlsruhe therefore allows for low-cost and sustainably energy-efficient operation.





Marienfelde Primary School, Berlin

The all-day school's main building from the 1970s has been refurbished extensively. The top priorities were to facilitate social interaction and provide a comfortable environment for everybody. High indoor air quality was a vital aspect here. Funding programmes, such as the Berlin Sustainable Development Programme (BENE), called for strict criteria for the ventilation equipment. The TROX SCHOOLAIR-V-HE devices feature a heat recovery efficiency rate of 84%. This means that we even managed to significantly exceed the required minimum value of 80%. This high degree of efficiency improves the school's energetic balance, and it also provides for a shorter amortisation period.

Thanks to their compact base area of just 600 x 400 mm, three SCHOOLAIR devices per classroom could be easily installed on external walls and integrated into the space concept. The central idea to improve learning with fresh air was realised to perfection. A master/slave connection ensures that all devices behave identically.

The primary school in Marienfelde benefits from a pleasant room temperature all year round, effective removal of pollutants such as dust and pollen from the air, minimised outdoor noise and optimised acoustic properties. Speech remains easily audible at all times, making it easier for students to follow their lessons. The steady supply of fresh air also improves the students' performance and learning results.

In times of COVID-19, this ongoing dilution of room air with fresh air also means that the risk of infection can be minimised when distance and hygiene rules are also followed and face masks are worn. The SCHOOLAIR devices can therefore help effectively to comply with the ventilation aspect of the general measures for tackling the pandemic (social distancing, hygiene, face coverings, ventilation).





Hospital Infantil Virgen del Rocío, Seville.

Refurbishing the 50 years old children's hospital was a special challenge for everyone involved, as the work took place within less than four months, while operations at the hospital continued under the conditions necessary due to the pandemic. Extremely tight delivery deadlines had to be met and perfect coordination of all suppliers was vital. The project had been planned two years earlier, but needed to be reviewed and adjusted technically because of the pandemic, to comply with the COVID-19 protocols.

TROX España equipped the children's hospital with a fully coordinated system: from air treatment and smart control through to air distribution with high-performance HEPA filter systems.

Configuration of the TROX HEPA filters for operating theatres was precisely adapted to each room by the Spanish TROX factory, and perfectly integrated into the interior design plans of the architects Arsenio Hueros and Sofia Toledo. The goal was to create a relaxed and comfortable environment for the young patients. One example of this are bubbles that appear to be floating in the air, which were integrated into the perforated metal sheets that cover the ventilation and air conditioning system on the ceilings of the operating theatres.

The heating, ventilation and air conditioning technology required almost as much space as the operating theatres on the top floor of the hospital, and was therefore placed in a separate room on the roof.

It was a complicated project but it was completed very successfully: open spaces without pillars or alcoves make for a clean look, TROX technology provides virus-free indoor air and energy-efficient air conditioning, while the airy interior design of the operating theatres has a calming effect on the young patients.



The TROX GROUP

2020

The TROX GROUP at a glance – relevant key figures

TROX GROUP sales
in million €

516 2020
533 2019

Production sites
worldwide

19 2020
16 2019

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

30.4 2020
29,0 2019*

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 FOR A HIGH QUALITY OF LIVING

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
around the world

33 in **29** countries
2020

31 in **29** countries
2019

CO₂ emissions
of the TROX GROUP
in t

15,993
2020

15,711
2019*

Social performance indicators at the TROX GROUP

Staff members
at the end of the year
Number

4,316 2020
4,007 2019

Staff turnover
in % of the headcount

6.9 % 2020
5,1 % 2019*

Average period
of employment
in years

12.2 2020
12.7 2019

Permanently employed
staff members
Number

3,960 2020
3,681 2019

Part-time staff members
Number

214 2020
284 2019

Average age
in years

41.8 2020
39.3 2019

Positions filled
by women
Number

829 2020
753 2019

Women in senior positions
Number

53 2020
49 2019

Apprentices
Number

125 2020
116 2019

*This figure deviates from the TROX Sustainability Report 2019, owing to better data capture.

Glossary

Sustainability

A

AIR POLLUTANTS

An emission that can have harmful impact on the environment, such as NO_x or CO. Air pollution can occur naturally or be caused by human beings.

ANTHROPOCENE

The name of the era in which human beings became one of the most important influencing factors of biological, geological and atmospheric processes on earth (the past about 30,000 years, accounting for about 3 seconds of the history of the earth).

B

BIODIVERSITY

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

BUND

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. Greenhouse gas, atoxic, colour and odourless gas. It is produced in particular through combustion of energy transfer media that contain coal.

CARBON MONOXIDE (CO)

Toxic, flammable and odourless gas. It is produced through incomplete combustion of energy transfer media that contain coal.

CFC

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.

CIRCULAR ECONOMY

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

CLIMATE ADJUSTMENT

Measures for dealing with global warming.

CLIMATE NEUTRALITY

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

CO₂

Toxic, odourless and flammable gas. 37 billion tonnes of CO₂ are released to the atmosphere every year. 28% thereof are accounted for by China, 15% by the US, 10% by Europe, 6% by Latin America, 5% by Russia, 4% by Africa, and 32% by the rest of the world. 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 diesel emission.

DIESEL SOOT

See diesel emissions.

DIN EN ISO 14001

European environmental management standard.

DIN EN ISO 9001

European quality management standard.

DIVERSITY

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

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 mineral oil 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 the physical sense), 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 the collector).

FONA STRATEGY

With its FONA strategy to promote research and sustainability, the 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.

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 STANDARDS

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 a reduction of CO₂ emissions by 21%, down to the 1990 level by 2012.

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

MINERAL OIL TAX

Excise duty on mineral oils and natural gas.

N

NITROGEN OXIDES (NO_x)

Collective term for gaseous oxides of nitrogen.

NUCLEAR POWER STATION

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.

PARTICULATE MATTER

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

PRIMARY ENERGY

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

PROCESS

A set of activities that interact within a system.

PRODUCT LIFE CYCLE

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

R

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.

SUSTAINABILITY

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

SUSTAINABILITY COUNCIL

The federal government's advisory council for sustainable development.

SUSTAINABLE FINANCE ADVISORY BOARD

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

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.

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.

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; 17goals.org
(p. 34–37, 40–43),
NABU p. 97),
Markus Kümmerle, SKK (p. 102/103),
Stefan Meyer (p. 104/105),
JMST Studio, Spanien; jmst.es (p. 106/107)

