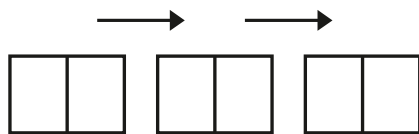

Corporate Responsibility Report 2021

LIEBHERR

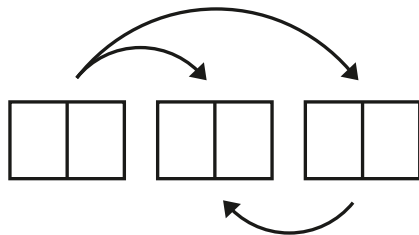
Liebherr-Hausgeräte GmbH





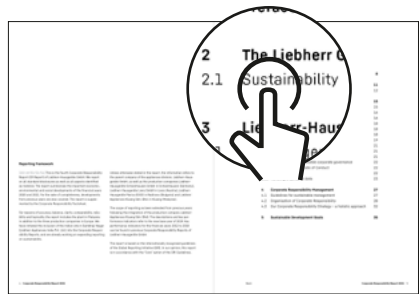
Traditional navigation

You can read the Corporate Responsibility Report of Liebherr-Hausgeräte GmbH in the traditional way, from page 1 right through to the end.



Targeted navigation

Use the links in the table of contents, the bottom navigation bar or the GRI index to go directly to a specific page.



You can select each item directly in the table of contents at the beginning of this report.



Use the navigation items at the bottom of the page to go to the table of contents or to undo an action.



Clicking a page number in the GRI index will take you directly to that page.

We are independent

“Our independence enables us to take decisions rapidly and autonomously.”

We are a trustworthy partner

“We aim to maintain our consistency and trustworthiness for many years to come.”

We are innovative

“We work systematically to keep one step ahead.”

Our employees are a key factor in our success

“We greatly appreciate the degree to which our employees identify with their company.”

The highest quality in everything we do

“We devote all our efforts to best performance.”

We accept responsibility

“We aim at all times to fulfil our responsibility to society in general and to the environment.”

Reporting framework

[102-49/50/52/54] This is the fourth Corporate Responsibility Report (CR Report) of Liebherr-Hausgeräte GmbH. We report on all standard disclosures as well as all aspects identified as material. The report summarises the important economic, environmental and social developments of the financial years 2020 and 2021. For the sake of completeness, developments from previous years are also covered. The report is supplemented by the Corporate Responsibility Factsheet.

For reasons of accuracy, balance, clarity, comparability, reliability and timeless, the report includes the three production sites in Europe as well as the production site in Malaysia. We are already working on expanding reporting on sustainability and have initiated the inclusion of the Indian site in Sambhaji Nagar (Liebherr Appliances India Pvt. Ltd.).

Unless otherwise stated in the report, the information refers to the parent company of the appliances division, Liebherr-Hausgeräte GmbH, as well as the production companies Liebherr-Hausgeräte Ochsenhausen GmbH in Ochsenhausen (Germany), Liebherr-Hausgeräte Lienz GmbH in Lienz (Austria), Liebherr-Hausgeräte Marica EOOD in Radinovo (Bulgaria) and Liebherr Appliances Kluang Sdn. Bhd. in Kluang (Malaysia).

The scope of reporting as been extended from previous years following the integration of the production company Liebherr Appliances Kluang Sdn. Bhd. The descriptions and key performance indicators refer to the new base year of 2019. Key performance indicators for the financial years 2012 to 2018 can be found in previous Corporate Responsibility Reports of Liebherr-Hausgeräte GmbH.

The report is based on the internationally recognised guidelines of the Global Reporting Initiative (GRI). In our opinion, this report fulfills “Core” option of the GRI Guidelines.

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Preface by the Management

Dear readers,

[102-14/16/18/49/50/51] The years 2020 and 2021 demanded adaptability and resilience from all of us, both as individuals and as a company. We felt the effects of the ongoing Covid-19 pandemic in various areas. It brought home just how fragile and vulnerable our ecological, economic and social structures are. Ultimately, it clearly underlined the necessity and importance of responsible action. These experiences spur us on in our need to continue developing sustainably.

The political goals for sustainable development provide a guide. One of them is the 2030 Agenda for Sustainable Development, with which the United Nations in 2015 set the course for global change towards low-emission lifestyles and economies. Another is the European Green Deal formulated by the European Commission in 2019 – a roadmap to make the EU economy more sustainable, aiming for the continent to be climate-neutral by 2050.

In our previous Corporate Responsibility Report for 2019 (published in October 2020), we elaborated on how Liebherr-Hausgeräte is contributing to the achievement of the United Nations' Sustainable Development Goals (SDGs). In the current report, we continue this and show the progress we have made in all areas of our business.

– We pay thorough attention at all our sites to energy and resource management, to waste management and climate protection. An impressive example is the development and implementation of an integral concept for energy optimisation at the Ochsenhausen site. This includes investments in renewable energies, such as for a 2 MW photovoltaic system.

We included the production company in Malaysia for the first time in 2021. Since the founding of the company in Kluang in 2007, much has been spent on modernising and expanding the production facilities in an environmentally friendly manner.

- Our appliances are already among the most energy efficient and durable on the market. This has also been confirmed following the introduction of the new EU energy efficiency classes. With our newly launched generations of fully integrated and freestanding appliances for private use, we have once again achieved top rankings in the key product segments.
- We offer our employees an attractive place to work, promote diversity and entrepreneurship, and place great importance on a healthy working environment. The health of employees has been a particular focus in the last two years. During the Covid-19 pandemic, we therefore developed and implemented many preventive measures and other work processes specifically for this situation.

Despite all the progress, we are not yet finished. We see Corporate Responsibility as a process that needs to be continuously honed and expanded. This is why we regularly review our Corporate Responsibility Strategy and adjust our targets. We want to reconcile economy, ecology and society, and are committed to this principle in every area of the company.

Our regular Corporate Responsibility Reports aim to inform you about this process, about our contribution and the specific steps we have taken. We are very keen to know what our readers think, so we look forward to receiving your suggestions and feedback.

“Our business decisions are always made in harmony with the economy, environment and society.”

The management board of Liebherr-Hausgeräte GmbH



Steffen Nagel



Thomas Obererlacher



Detlef Walther

4th management position still vacant at the time of writing.

1949

The family business established
by Hans Liebherr

LIEBHERR

49,611

Employees

> 140

Companies

11,639

€m turnover

9%

Portion of the total turnover by
the refrigeration and freezing
product segment

The Liebherr Group

Founded in 1949, the group now includes more than 140 companies on all continents and employs 49,611 people.

[102-11/16/18/22] The Liebherr Group is a technology company with a broadly diversified product range and is one of the world's biggest manufacturers of construction equipment. However, it also provides high-quality, user-oriented products and services to many other sectors. The holding company of the group is Liebherr-International AG, based in Bulle, Switzerland. All its shareholders are members of the Liebherr family. The family-run company values long-term success, sustainable development, stability and reliability.

Liebherr develops and manufactures an enormous variety of fascinating products which are renowned on the world's markets for their high precision, excellent workmanship and exceptional durability. The company aims to inspire its customers with its innovations and visionary technologies. In doing so, it constantly pushes the boundaries of what was previously possible, which means that Liebherr regularly contributes to technological progress. Working together on fascinating tasks creates a strong team spirit which employees can rely on – across national borders and continents.

The family shareholders active in the group (from left to right): Jan Liebherr, Stéfanie Wohlfarth, Sophie Albrecht, Philipp Liebherr, Patricia Rüt, Johanna Platt, Isolde Liebherr, Willi Liebherr



How we see ourselves

With his visionary ideas, passion and unerring instinct for promising technologies, Hans Liebherr laid the foundations for the Liebherr Group in 1949. Liebherr remains stable and reliable to this day, thanks to the personal commitment of the company's management and its tradition as an independent family business, known as a pioneer of groundbreaking innovations with the highest quality standards. Liebherr has always been a wholly-owned family business, giving it the freedom to act and make its own decisions in all its activities. With its high equity ratio and broadly diversified range of products, Liebherr is able to compensate for market-related economic fluctuations. Its values-based corporate culture ensures a strong team spirit and trustful relationships with partners and customers that last years or even decades – characterised by fairness and mutual respect. Upholding personal integrity in business relationships and maintaining job security are important corporate directives. The employees are an elementary part of the company. With their ideas and commitment, they all personally contribute to creating great things – no matter how demanding the task in hand. Liebherr responds flexibly to the wishes of its customers and also offers tailor-made solutions. Its close customer relationships and the great value it places on customer benefits are the basis for the company's success and an important part of its corporate culture. As descendants of the company's founder, the shareholders are aware of their entrepreneurial responsibility. They must ensure long-term success and sustainability as a foundation for further development and a solid financial basis – profits are reinvested and, by remaining within the group, guarantee its future.





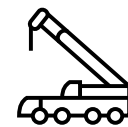



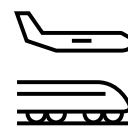




2.1 Sustainability

[102-11/16] The group aims to generate sustainable values – for employees, customers, suppliers and society. As an independent family business geared towards the long term, Liebherr is aware of its responsibility and is committed to sustainable development. Its products, processes and infrastructure are designed to consume as few resources as possible. In every area, the focus is on safety, economy and environmental compatibility. Over the past two years, several of our companies have worked on projects aimed at sustainability in social, ecological and economic terms.

Isolde Liebherr: We take the topic of Corporate Responsibility very seriously. It has been one of our principles and core values for decades. This means it has always been the basis for entrepreneurial decisions. Due to the decentralised and diversified nature of the group, we used to carry out many CR activities separately in the individual product segments and companies. However, various topics have now been established on a group-wide level.

Stéfanie Wohlfarth: We are currently developing an overall concept for Corporate Responsibility in the group and anchoring it in the organisation. Based on this, we will initiate group-level CR reporting for key topics. The publication of the first group-wide CR report is planned for 2024.



Product segments of the group												
												
Earthmoving	Material handling technology	Deep foundation machines	Mining	Mobile and crawler cranes	Tower cranes	Concrete technology	Maritime cranes	Aerospace and transportation systems	Gear technology and automation systems	Refrigeration and freezing	Components	Hotels



59

€m investments in 2021
[+55.3 % on 2020]

1,051

€m turnover in 2021 [+4.4 % on 2020]

6,618

Employees in 2021
[+5.1 % on 2020]

2.266

Million refrigerators and freezers in 2021
[–1.2 % on 2020]

5

Production sites
worldwide

Liebherr-Hausgeräte GmbH

3.1 The refrigeration and freezing product segment

We are experts in refrigeration and freezing and offer the highest quality in everything we do.

[102-1/2/3/4/5/18/45, 201/103] For more than six decades Liebherr-Hausgeräte GmbH has specialised in manufacturing innovative refrigerators and freezers. More than 6,600 employees develop and produce a wide range of refrigerators and freezers for domestic and commercial use at its sites in Ochsenhausen (Germany), Lienz (Austria), Radinovo (Bulgaria), Kluang (Malaysia) and Sambhaji Nagar (India). With an annual production of around 2.3 million appliances, we are not just one of Europe's leading premium suppliers, but also stand for quality, energy-efficient technology and elegant design.

In 1954, Hans Liebherr made his first refrigerators in Ochsenhausen and his appliances went into series production soon after. This laid the foundation for Liebherr-Hausgeräte GmbH, which is now the divisional controlling company of all sites for refrigerators and freezers, running one of the 13 product divisions of the Liebherr Group. The holding company of the group is Liebherr-International AG, based in Bulle, Switzerland. All its shareholders are members of the Liebherr family.

Liebherr-Hausgeräte aims to inspire its customers every day with intelligent refrigerators, freezers and custom solutions. Our leading market position is characterised by our continuous drive for perfection and love of detail. As a manufacturer of premium appliances, we are not only a driver of innovation, but have always demanded the highest standards of quality and longevity from our products. Our domestic appliances have exceptional features to ensure optimum food storage and keep it fresh for longer. For professional use, whether in business, trade, gastronomy, commercial enterprises or in medicine and laboratories, our refrigerators and freezers represent total dependability with intelligent features and unique quality. These factors and our dedicated service are the foundation for the trust which our customers have placed in the Liebherr brand ever since it was founded.

Our range of **domestic appliances** includes:

- Freestanding and tabletop refrigerators
- Fridge-freezers
- Fully integrated appliances
- Freestanding and tabletop freezers
- Chest freezers
- Wine cabinets
- Digital services

Our **commercial appliances** include comprehensive special ranges for:

- Hotels and gastronomy
- Bakeries
- Food retail
- Research and laboratories
- Beverage industry
- Frozen food and ice cream industry

The Sales & Marketing department is responsible for the essential management of the refrigeration and freezing product segment global sales and marketing activities. Selected sales intermediaries and our own sales and service companies in Switzerland, Germany, Austria, Bulgaria, the UK, Singapore, Malaysia, the USA, Canada, Russia, Brazil, India and South Africa ensure value-added marketing of our products and services. Together with the Product Management, Communication & Brand Management, Customer Service, eBusiness and New Business departments, the business areas work to successfully implement a target group-based sales and marketing strategy that is designed to offer our customers added value that they can experience every day.

The controlling company of the appliances division is Liebherr-Hausgeräte GmbH, based in Ochsenhausen. It manages the operation of the production and distribution companies in the various countries. The management consists of four equally ranking directors from the Sales & Marketing, Development, Production and Finance & Administration departments. The financial year ends on 31 December.

3.2 Our business model

We are leaders in terms of quality and refrigeration technology. We develop products characterised by maximum energy efficiency, freshness quality and ease of use. We continuously invest in research and development. Our five production sites form a modern and flexible manufacturing network that enables us to optimally cover all major market segments. We sell our products and services worldwide, both through our sales and service companies and through responsible partners with whom we enjoy a long-standing and trusting relationship. We support them in their work, for example by providing regular training. Our marketing concept based on added value ensures that our sales and trading partners are able to present our refrigerators and freezers in an attractive way. Expert, customer-oriented service rounds off our business model.

Our vision

Every day we inspire our customers with smart appliances and customised solutions.

As part of the Liebherr Group, the appliances division has been developing, producing and selling a wide range of high-quality refrigerators and freezers since 1954. Time and again, we impress our customers with brand new features, pushing back the boundaries of what was previously possible. We are always a step ahead, already thinking about the future.

With almost seven decades of experience in refrigeration and freezing, we are one of Europe's leading suppliers. Our core business is complemented by digital products and solutions.

3.3 Strategic orientation

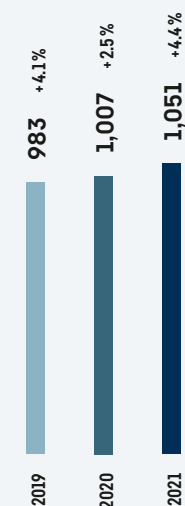
We aim to continue growing profitably and secure our profitability through innovation, a market-oriented product range and cost orientation. Due to the increasingly dynamic global markets, focussing on the customer is now more than ever a key factor for success. This is why we pursue a clearly structured path that is consistently oriented towards the customers. Our four strategic priority areas are based on our vision.

- To actively scale our European core market
- To push on with focussed internationalisation
- To expand the commercial segment
- To achieve significant added value through digital business models

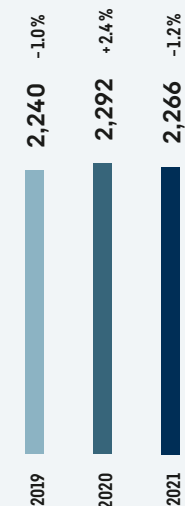
They have shaped the strategy of the Liebherr-Hausgeräte since 2019. We plan for the long term and our growth is organic.

In Europe, we want to continue to play a significant role in the upmarket segment. The new Peak and Prime series of fully integrated and freestanding appliances make a key contribution to this. Outside Europe, especially in the American and Asian economic areas, we want to continue growing with products and services tailored to the specific requirements of the individual markets. This includes the luxurious Monolith range especially for the American market. In every segment, we want to make a contribution to a sustainable economy and lifestyle with our durable, energy-saving and resource-efficient products.

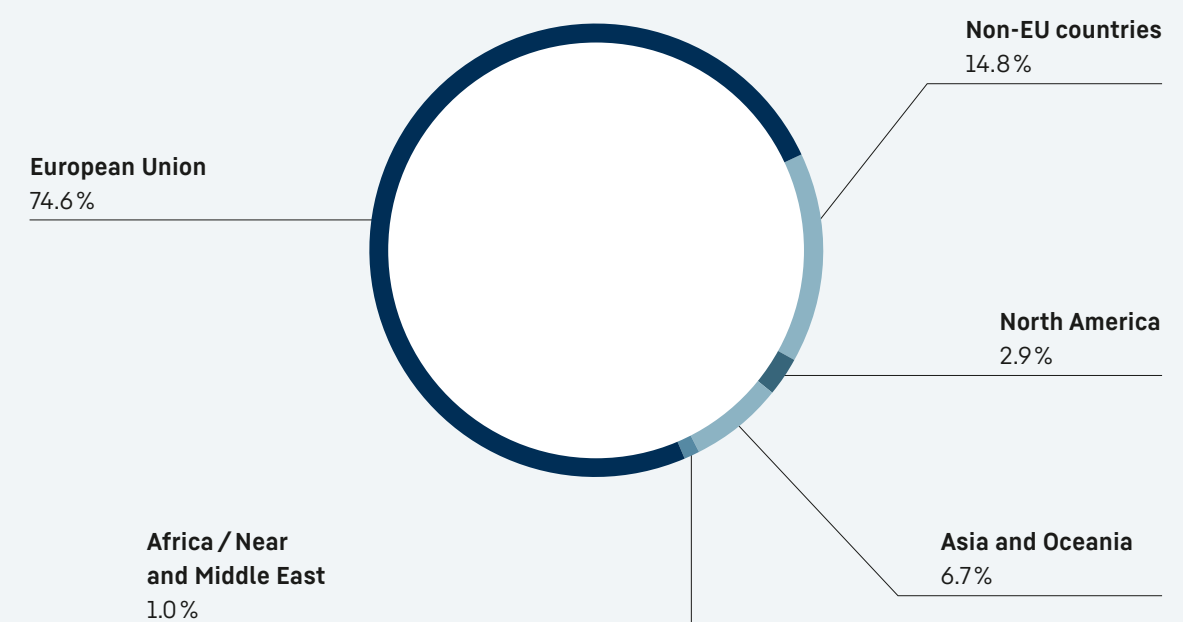
Sales performance in €m



Worldwide sales performance in millions of appliances



Turnover and sales development by sales region in 2021



3.4 Turnover and sales development

[102-6/7, 201-1] In 2021 we sold 2.266 million refrigerators and freezers worldwide. By comparison, in 2020 we sold 2.292 million appliances, which means there was a reduction of 1.2%. By the end of the financial year 2021 we had achieved turn-over of €1,051m. In 2020 it was €1,007m, meaning there was an increase of 4.4%.

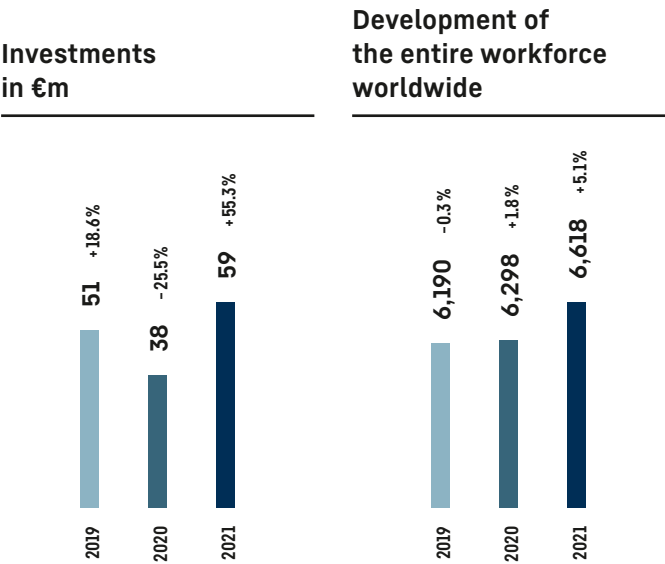
In 2021, the global market for large domestic appliances showed a slightly positive development. This was mainly attributable to growth in the refrigerator segment, which offset the negative development in the freezer segment. Overall, we kept up with the positive trend in the combined refrigeration and freezing product segment. Although Germany, the most important market in this segment, declined, slight increases in sales were achieved in Europe. These were mainly attributable to growth in Bulgaria, France and Spain. The non-EU countries, in particular Switzerland, Turkey and the United Kingdom, also provided an overall positive development. While the North America region was characterised by significant growth impetus from the USA and Canada, sales in Central and South America declined again. In the Near and Middle East, Liebherr achieved significant growth, driven in particular by increases in Israel, Saudi Arabia and South Africa. In Asia and Oceania, declines in sales in the Japanese and Indonesian markets were offset by increases in India as well as in Taiwan and Vietnam.

In 2021, we were again able to present innovative new refrigeration and freezing products. One milestone was the launch of the new fully integrated appliance series, which won the Red Dot Award in the “Best of the Best” class. The range offers appliances from the high-quality entry level to the luxury segment and combines energy efficiency and resource-saving freshness technology to reduce food waste.

In 2021, the new regulation on energy efficiency labelling of electrical appliances within the EU came into force. The efficiency of electrical appliances is now easier to classify because they are rated across the entire range of the efficiency scale from A to G. After the change, Liebherr appliances still occupy top positions in the refrigeration and freezing segments.

3.5 Investments

The total investment in 2021 was €59m (in 2020: €38m, +55.3%). The investments focussed mainly on new product projects, modernisation of buildings, energy optimisation of sites as well as target-group-oriented digital solutions, service models and business models.



3.6 Employees

[102-7/8] In 2021, we employed a total of 6,618 employees. This was an increase of 5.1% compared to the previous year (2020: 6,298). During the reporting period and in the preceding years, there were no compulsory redundancies at any of our locations. Continuous investment is part of a future-oriented and responsible policy for our locations. Cooperation in a spirit of partnership is based on stability, fairness, personal appreciation and freedom to act, in keeping with Liebherr’s tradition as a family-run company. At every location and in each country, our employees receive the technical and personal support that they require. This strengthens international cohesion and promotes teamwork across countries.

3.7 Liebherr-Hausgeräte Corporate Policy

[102-11, 102-14/15/16/17/18, 201/103, 202/103, 204/103, 205/103, 206/103, 301/103, 302/103, 303/103, 304/103, 305/103, 306/103, 307/103, 308/103, 401/103, 402/103, 403/103, 404/103, 405/103, 406/103, 407/103, 408/103, 409/103, 412/103, 414/103, 416/103, 417/103, 418/103, 419/103] We are a globally active family-owned company and as such we have a great responsibility to society, the environment, our customers, our employees and our suppliers. We are convinced that we can only achieve long term success if we always give due consideration to this in our actions and achieve the best possible harmony of economy, ecology and social requirements. This policy clearly defines the core values of the Liebherr Group and expresses what Liebherr-Hausgeräte GmbH means by quality, sustainability and responsibility. It applies in its entirety to every site.

Our ultimate objective is to be the “first choice” of our customers. We therefore want to be able to react flexibly to their wishes and establish ourselves as their partner of choice in the long term. Our appliances feature innovative, green technologies, elegant design and a high standard of quality. Our quality claim follows the logic of the “Zero-Error-Principle” which means that error prevention is the main focus. Our processes undergo successive and continuous improvement through the controls we have established.

Our employees are the key to our joint success. We are convinced that our committed employees can continue to maintain the quality of our products and services in the future. Our working relationship is based on the principles of decency, mutual respect, fairness and trust. We undertake to support our employees’ careers with basic and advanced training and to provide them with secure jobs and a healthy working environment. We also provide necessary information and resources to achieve the agreed objectives. These courses are designed to motivate our employees in the long term so that they each accept their responsibility for the company and to work with competence on the continuous improvement in the fields of quality, environment, energy and sustainability.

We express our commitment to sustainability and environmental management in our Corporate Policy. As part of this, our responsibility to the environment begins with the design of our appliance ranges. Our aim is to reduce the environmental effects of our products and production plants as far as possible.

The stress, adverse effects or dangers to which our employees, local residents and the environment are exposed are also minimised. This applies even in the event emergencies and breakdowns. To achieve maximum safety, we have established precautions which are regularly reviewed, evaluated and, where necessary, developed.

We involve partners such as suppliers and service providers in our standards on quality, environment, energy and sustainability at an early stage. When procuring products and services, investing in new plants or converting existing ones, we look out for the best solution in terms of energy.

We want to maintain an open and objective dialogue with our employees and the public.

Our Integrated Management System is designed to satisfy these requirements and achieve our objectives. Its effectiveness is reviewed at regular intervals through audits and continuously improved.



Production sites of Liebherr-Hausgeräte GmbH

1
Ochsenhausen
Germany

5
Sambhaji Nagar
India

2
Lienz
Austria

3
Radinovo
Bulgaria

4
Kluang
Malaysia



3.8 Certifications and audits

[102-11, 102-18/19/20] The divisional controlling company and the production sites have a quality management system certified to ISO 9001 and an environmental management system certified to ISO 14001. In addition, the divisional controlling company and the European sites are certified to ISO 50001 (energy management).

Our Integrated Management System combines quality, environmental and energy aspects.

In order to exploit synergies, we systematically implement the requirements of the three standards in a coordinated manner in a uniform, Integrated Management System (IMS). Occupational health and safety is organised on the basis of the standard ISO 45000.

External and internal audits are carried out regularly to ensure conformity with standards and the functionality of the Integrated Management System. The group audit for ISO 9001, ISO 14001 and ISO 50001 takes place in a matrix process. Consequently, our divisional controlling company for the appliances division and selected sites is audited annually by an external auditor. In addition, each location undergoes annual, internal system audits in the areas of quality, environment and hazard prevention.

3.9 Responsibilities

The management of Liebherr-Hausgeräte GmbH bears primary responsibility for the organisation, monitoring and implementation of all measures. The management board of the divisional controlling company is responsible for all matters concerning the quality, environmental and energy management system (Integrated Management System). It works closely with the head of quality management and the site managers. Together they ensure that the processes required for the Integrated Management System are implemented and that the requirements of the standards are met at the individual sites.

In cooperation with those in charge of environmental management at the sites, the management board ensures that the requirements of ISO 14001 are met and that employees comply with environmental standards. In addition, specially trained environmental consultants are available as points of contact in the specialist departments.

3.10 Management review

At least once a year, the management board evaluates the effectiveness of the Integrated Management System in management reviews. In the review, the findings from audits and recommendations for improvements are taken into account, as is the status of preventive and corrective measures. For us and our employees, it is a matter of course that we always comply with the law and consistently observe the internal standards and instructions of the Group.



3.11 Compliance and responsible corporate governance

[205/103, 205-1/2/3, 206/103, 206-1, 406/103, 406-1, 408/103, 409/103, 412/103, 419-1] As a family-run group of companies, we place great value on integrity. By adhering to our guidelines and core values, we create the basis for successful corporate governance and uphold our responsibility towards our stakeholders. In our view, this above all means always acting in accordance with the applicable laws and ensuring compliance with internal standards and codes of conduct. This strengthens our credibility and the trust with business contacts, employees, customers and the general public. Our understanding of the term “compliance” not only means combating corruption, but also, in particular, adherence to the rules of law governing competition and foreign trade. Our compliance rules are thus based on national and international standards to ensure fair competition. To enable our managers and employees to act with integrity and comply with the regulations, we have issued various [internal standards and codes of conduct](#). In addition to this, managers and employees take part in compliance training courses. We do not tolerate penalisation, discrimination or sanctions against whistleblowers who report a breach of compliance. Neither do we tolerate misuse of a compliance notification.

There were no cases of corruption during the reporting period and no breaches of compliance with laws and regulations were reported.

3.12 The Liebherr Group Code of Conduct

[102-16/17, 406-1, 408-1, 409-1, 412-1/2] The [Code of Conduct](#) drawn up by the Liebherr Group and its companies has been in force since 2009. It is a guideline for all employees and sets clear standards on integrity and the proper conduct of business. Our employees are required to use their judgement in a responsible and prudent manner and to be guided by honesty, reliability and integrity. They must not abuse their position for personal gain. Similarly, they must not encourage or tolerate behaviour that is not in accordance with the Code of Conduct.

Our employees can contact their managers or the HR department at any time with questions and comments or to request assistance. New employees are informed of the Code of Conduct when they join the company. During the reporting period, no significant breaches of the Code of Conduct occurred in Liebherr-Hausgeräte GmbH.

Our business contacts are also encouraged to comply with our Code of Conduct. We have a diverse and constant demand for materials, products and services and therefore work with many different technology partners. The [Code of Conduct for Suppliers](#) applicable from 2022 onwards is based on the Liebherr Group’s Code of Conduct and sets out in concrete terms what we expect from our suppliers and what they must do for us.

3.13 Whistleblowing

[102-17] Compliance with laws and internal regulations is of the highest priority for us. In order to meet this requirement, it is important to learn of potential misconduct at an early stage and to investigate it immediately. To comply with the rule of law and the Code of Conduct, the Liebherr Group encourages its employees as well as external whistleblowers to report any possible misconduct. With the introduction of the EU Whistleblowing Directive, the Liebherr Group has placed its [whistleblowing system](#) more prominently on the group compliance website.

Employees have several options for reporting suspected compliance violations, and can do so in several languages. We assure every internal and external whistleblower who reports a compliance violation in good faith that the notification and personal information will be treated confidentially. We will not tolerate any penalisation, discrimination or sanctions against a whistleblower who reports a breach of compliance.

3.14 Handling of personal data

[418/103, 418-1] We ensure that all personal data relating to our employees and customers is collected, stored and processed in a manner compliant with data protection requirements. With regard to requests from data subjects, we have established all required processes within each company. When developing or acquiring digital products, we apply the principles of privacy by design and default. This applies to internal applications, digital customer-related product developments and sales. At the individual sites, the data protection coordinators monitor compliance with national and international data privacy regulations in cooperation with the Group Data Protection Officer and those responsible in each country. The data protection coordinators also promote the implementation of the company’s internal policies and provide the individual departments with comprehensive advice on data protection issues.

In the reporting period, three data protection incidents concerning the unintentional disclosure of email distribution lists were reported. No loss of customer data was identified.

All inquiries from data subjects were answered in a timely manner during the reporting period. No complaints were made to the relevant supervisory authorities. We notified the supervisory authorities of any reportable data privacy incidents within the statutory period and took appropriate countermeasures.

More comfort, safety and service –
SmartDevice equips you for the future.



A tradition of innovation

Developments from 1954 to 2022

With the conversion to a CFC/HFC-free appliance range, patented BioFresh technology and the most energy-efficient refrigerators and freezers in the main product segments, we have always been a pioneer in the industry.

1954

Establishment of Liebherr-Hausgeräte Ochsenhausen GmbH, Germany

1971

First electronic control system

1971

Electronic Control

1987

"No more defrosting" with NoFrost technology

1987

No Frost

1996

Liebherr patents BioFresh technology

1996

Bio Fresh

2004

Introduction of explosion-protected refrigerators and freezers for research and laboratories

2004

LED

2004

Use of energy-efficient LED lighting

2007

Establishment of Liebherr Appliances Kluang SDN. BHD., Malaysia

2010

Introduction of DuoCooling

2010

Duo Cooling

2010

Certification of quality management at the location in Kluang according to ISO 9001

2014

Introduction of the Guidelines for Successful Cooperation

2014

CFC/HFC-free

2014

Introduction of CFC/HFC-free range of appliances, as well as in the USA with the widest CFC/HFC-free product portfolio in the industry

2016

BluPerformance: new freestanding appliances of the highest energy efficiency class

2016

BLU Performance

2018

Introduction of the fridge configurator

2018

Smart Device

2018

Smart Device

2018

Introduction of the energy management system at the Lienz and Radinovo sites according to ISO 50001

2018

Mystyle

2021

Introduction of the new generation of fully integrated appliances



1966

Introduction of the FrostSafe system

1980

Establishment of Liebherr-Hausgeräte Lienz GmbH, Austria

1990 – 1992

Conversion to water recirculation in paint pretreatment and plastic processing

1993

Conversion to a range of CFC/HFC-free appliance

1993

Frost Safe System

1995

Certification of quality management at the Ochsenhausen site according to ISO 9001

2000

Establishment of Liebherr-Hausgeräte Marica EOOD in Radinovo, Bulgaria

2005

Signing of the CECED Code of Conduct

2009

Ever more economical: first A+++ appliances produced

2009

Certification of environmental management at all European locations according to ISO 14001, Code of Conduct of the Liebherr Group

2013

Establishment of Liebherr Appliances India Pvt Ltd.

2013

Certification of environmental management at the location in Kluang as per ISO 14001, introduction of the Integrated Management System

2015

Certification of energy management at the location in Ochsenhausen according to ISO 50001

2017

EnergyStar "Most Efficient" for several appliances for the seventh year in a row

2019

New dimension for fully integrated appliances

2019

The Lienz site was evaluated for the first time in the EcoVadis independent sustainability rating and awarded the silver medal

2019

MONOLITH Cooling Redefined

2022

Introduction of the new freestanding appliances

Corporate Responsibility Management

The company must have suitable structures for balancing economic, environmental and social aspects.

4.1 Guidelines for sustainable management

[102-11/15/16/18/19/20, 201-2] We make all our business decisions in harmony with the economy, ecology and society. The principle of sustainability applies to every area of our company – and we expect the same from our business partnerships. In addition, our Code of Conduct sets binding standards for integrity and proper business conduct. These standards are based on Liebherr’s core values.

As a part of a family-run company with a long-term orientation, our product division is characterised by solid economic management. This is the basis for our contribution to shaping a sustainable future.

We pursue an integral and economically responsible approach to environmental protection that encompasses the entire life cycle: from the definition based on customer requirements, development, production and use of the appliances right through to their disposal. Key aspects in this respect are energy and resource management, waste management and climate protection. This way, we hope to make a positive contribution to the common good. We feel particularly connected to the areas immediately around our plants. We employ a great many people and have an important social role – and we are highly aware of our responsibilities in the regions surrounding our locations.

We are committed to conducting business responsibly on every level.

Independent surveys also confirm that we at Liebherr-Hausgeräte GmbH clearly implement the core Liebherr value of taking responsibility. For example, in a nationwide survey of more than 500,000 consumers in 2021, Liebherr-Hausgeräte GmbH’s commitment to sustainability was rated as “very strong”. The survey was conducted by ServiceValue in cooperation with Deutschland Test and Focus-Money. We had already achieved a very high approval rating with the BILD “particularly sustainable” seal the year before, and in May 2021, the UK’s Ethical Consumer Magazine listed Liebherr as one of the recommended brands in its guide to refrigerators and freezers.

The Lienz site in Austria, which specialises in producing commercial appliances, was again assessed in the EcoVadis independent sustainability rating in the summer of 2021 and awarded the silver medal. The award recognises the company’s ongoing commitment to the environment, employment and human rights, ethics and sustainable procurement. We were able to improve our overall rating by an additional five points. This puts us well above the industry average, particularly in the area of the environment.

Materiality analysis

Identifying issues with stakeholders

Guidelines for sustainable management

Balance between economy, ecology and society

Holistic

Corporate Responsibility Strategy

4.2 Organisation of Corporate Responsibility

The management at Liebherr-Hausgeräte GmbH are the primary stewards of our Corporate Responsibility obligations. The position of Corporate Responsibility Manager was established in 2013 to better coordinate individual measures. Since then, the importance of sustainability in the company has grown constantly. The topic is now firmly established throughout the company – both at our sites in areas such as occupational safety, waste management and production, as well as in global areas such as product-related and operational environmental protection, industrial engineering, product management, human resources, purchasing, quality, development, marketing, customer service and supply chain management.

Our stakeholders are at the centre of our Corporate Responsibility Strategy.

[102-12/13/15/21/40/42/43/44/46/49, 201-2, 413-1] Our stakeholders are all the individuals and organisations with whom we as a company maintain a relationship and who are in dialogue with us. They also include anyone who is seeking a dialogue with us or who is interested in our company and its products. The specialist departments and the management board are in contact with the stakeholders in a variety of ways. This is because we value regular communication with all these groups of people.

As part of our product and corporate communications, we are in continuous dialogue with customers and partners regarding customer, product and market requirements.

Our employees can actively influence and develop the company with its products and processes. The instruments we use to achieve this are co-determination, employee surveys, strategic dialogue, idea management and the continuous improvement process.

[102-40] Overview of the most important stakeholder groups with whom we are in regular contact

Owners / shareholders

Liebherr-Hausgeräte companies

Employees

Customers

End customers, business customers, industrial customers, OEM customers, importers, trade / sales departments (channels), multinational corporate customers

Suppliers / service providers

Suppliers (production and non-production material), service providers (IT, logistics, marketing, disposal, product, operation / organisation), service partners

Environment

Liebherr companies, educational / scientific institutions, official authorities / offices, local authorities, government organisations, NGOs, consumer organisations, associations / trade unions, banks / insurance companies, medical care facilities, external individuals, public relations / media

At the European level, Liebherr-Hausgeräte is a member of the umbrella organisation of domestic appliance manufacturers [APPLiA](#) (formerly CECED). At the national level, we are members of the central associations of the electrical engineering and electronics industries. In Germany, we are a member of the industrial association for building services, heating and kitchen technology (HKI) and are active in the HAUSGERÄTE+ initiative.

The sites maintain close personal contacts with the local municipalities and residents, exchanging information on site-specific topics on an ongoing basis. Through our press and public relations work, we maintain an open and factual discussion with the local press and inform them about topics related to the company and its products.

In the areas of product development, refrigeration technology and foodstuffs, we have long-term partnerships with various scientific institutes and university institutions. So far, we have rarely come into direct contact with interregional non-governmental organisations.

The key points of our Corporate Responsibility Management are based on the results of the materiality analysis.

This report is based on the current guidelines of the Global Reporting Initiative (GRI) and therefore takes the principle of materiality into account. We regard as “material” those issues that are important for our company as well as for our stakeholders.

In order to identify and prioritise key Corporate Responsibility issues, we exchange views with our stakeholders and discuss new or newly prioritised topics. Our ongoing dialogues enable us to gain as accurate a picture as possible of the concerns of our stakeholders, based on the systematic survey of 2015, in which we conducted telephone interviews and personal discussions with representatives of major multinational customers, trading partners, suppliers, associations, the media, NGOs and local authorities. In the online survey which followed, stakeholders were able to evaluate key sustainability-related topics. We also analysed other sources such as previous customer and employee surveys, workshops in the company’s specialist departments and dialogues with representatives of individual stakeholder groups.

More than 90% of the interviewees regarded Corporate Responsibility as generally being of medium to high importance. As regards our products, we received very good sustainability performance ratings. However, we also discovered that many of the company’s sustainability activities, such as operational environmental protection, observing environmental and social aspects in the supply chain or labour practices in the company, were unknown or only partially known to the interviewees at the time.



A survey of customers carried out in 2021 confirmed the results of the stakeholder analysis. 89% of those asked stated that they actively contribute to a more sustainable lifestyle in society.

The findings were then discussed in internal workshops and supplemented with additional specific topics. On this basis, we identified the topics that are of material relevance for our stakeholders as well as for our company – and which our specialist departments can directly influence.

We are continuously building on this and developing the materiality analysis. It has enabled us to detect an increasing environmental awareness among our stakeholders – and this in turn has led us to adjust our priorities and fields of action. The main changes are that we have set specific climate targets for our organisation and integrated the United Nations Sustainable Development Goals (SDGs) into this report.

[102-47] Materiality matrix according to the relevance for our stakeholders and for our company

Relevance to our stakeholders		Relevance to our company		
		Medium	High	Highest
Highest	Product labelling			Energy efficiency
	Data protection			Product quality
High				Customer satisfaction
				Product safety
				Product design and environmentally compatible appliance development
				Climate and environmental protection in the company
	Recycling / disposal processes			Delivery and quality reliability in the supply chain
	Environmental and social standards in the supply chain			Environmental / energy management
Medium	Environmental impact due to logistics			Use of materials
	Demonstrating our contribution to achieving the SDGs			Digitalisation
	Social commitment			Food storage management
				Compliance
				Value-oriented cooperation
	Co-determination			Training and education
	Work-life balance			Safety at work
	Diversity and equal opportunities			Health management

4.3 Our Corporate Responsibility Strategy – a holistic approach

Liebherr is a family-run company with a long tradition and deep-rooted core values. One of these basic values is that we accept responsibility and aim to meet our obligations towards society and the environment at all times."

In order to live up to this core value, we handle the issue of Corporate Responsibility holistically and at all stages of the product life cycle.

We pay attention to compliance with environmental and social standards as early as the supplier selection process, For example, we require declarations of compliance with the Code of Conduct as well as a specific code of conduct introduced in 2022 for suppliers to the Liebherr Group.

We attach great importance to environmentally friendly product design when developing our appliances. We conduct research on green materials, climate-friendly refrigerants, alternatives to plastics and efficient use of resources. At the same time, we want to live up to our responsibility to our staff – in other words, to be a good employer. We are bound by collective bargaining agreements, we actively represent the interests of our employees and we invest in training and further education, as well as in occupational safety and occupational health management. Job security and the company pension scheme for our employees are also very important to us.

We have set ourselves ambitious climate targets for our European production sites. For example, we switched to green electricity at the Lienz site as early as 2014 and at Ochsenhausen (Germany) in 2018. This enabled us to significantly reduce our CO₂ emissions. By 2030, we aim to achieve climate neutrality in Scopes 1 and 2 at our European sites.

According to life cycle assessments of our products, the biggest lever for an effective contribution to climate protection is during the use phase of refrigerators and freezers. In the case of highly energy-efficient appliances, two-thirds of CO₂ emissions occur during this phase. For less energy-efficient appliances, the use phase can account for almost 90 % of the total

footprint. Liebherr traditionally stands for particularly energy-efficient appliances, and we aim to continue occupying the top classes according to the new energy label in future. We benefit from our fast innovation and product cycles. The new label has inspired us to develop further innovative technologies to reduce energy consumption. With the new generations of appliances, we achieve top positions in the most important product segments and niches.

We meet our product responsibility by implementing all legal requirements for refrigerators and freezers – including, of course, the labelling of our appliances. With innovations like BioFresh we play our part in reducing food waste and help our customers lead a sustainable lifestyle.

We also offer our customers a longer service life thanks to our excellent repair service and the prolonged availability of spare parts. We run tests to ensure a service life of at least 15 years for all functional parts, which accounts for the extraordinary durability of our appliances. Even at the end of the product's life, we live up to our shared responsibility for it as the manufacturer. We bear the costs of collection and disposal of used appliances. We also inform our customers about correct disposal and provide them with the best possible support. This is why we also participate in various information campaigns.

During the recycling process, we inform the recyclers about possible hazardous substances using detailed labelling. In this way, we contribute to safe disposal. The aim is to recover as many raw materials as possible so that they can be returned to the material cycle.

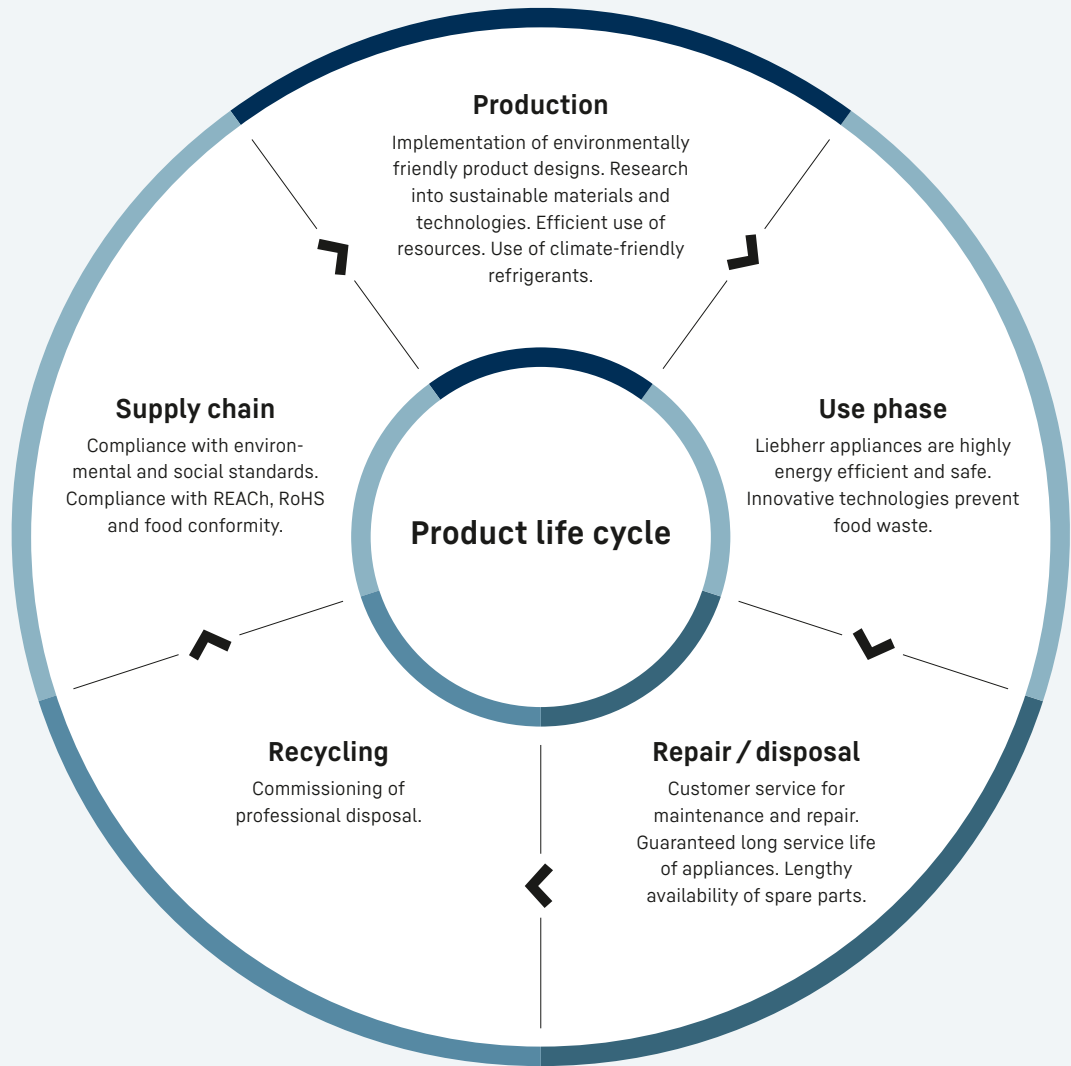
To achieve this goal, we are a partner in the German Federal Ministry of Education and Research (BMBF)-funded joint project entitled "Circular by Design: Resource Use Transition by Sustainable Product Design of Consumer Goods Using the Refrigerator/Freezer as a Case Study". This scientific project explores new paths for resource efficiency in the circular economy.

Our partners in it are:

- Helmholtz-Institut Freiberg für Ressourcentechnologie
- Wuppertal Institut für Klima, Umwelt, Energie GmbH
- Folkwang Universität der Künste
- BEC Becker Elektrorecycling Chemnitz GmbH
- Entsorgungsdienste Kreis Mittelsachsen GmbH (district waste disposal service)

Even though the integral Corporate Responsibility approach is at the centre of our work, we define parallel focus topics and the necessary measures to achieve them. In doing so, we hope to further develop our Corporate Responsibility strategy in those areas with the greatest leverage. This is because Corporate Responsibility Management is an ongoing process with which we intend to continuously improve our company's sustainability performance.

Our Corporate Responsibility Strategy – a holistic approach



Responsible
consumption
& production

Good
health and
well-being

Climate
protection



Sustainable Development Goals

Our contribution to achieving the Sustainable Development Goals (SDGs) of the United Nations.





[102-15, 102-49] In 2016, the United Nations called upon countries, institutions, companies and individuals worldwide to make visible their specific contribution to achieving the 17 ambitious goals towards sustainable development material. The aim is to eliminate fundamental injustices and barriers to participation in development and prosperity by 2030.

As a responsible company with a long-term perspective, we too are making our contribution to achieving these important goals. To this end, we are intensifying our efforts at particularly relevant points of leverage.

We have examined where we can achieve the most in our holistic Corporate Responsibility Management. Targeted cooperation with business partners and suppliers is an important aspect, for example. Together, we can do a lot to ensure that our products are useful and sustainable throughout their life cycle – for people and for nature.

We have identified nine goals to which we can make a significant contribution:



We are also making an important contribution to these goals:



Production

12 RESPONSIBLE CONSUMPTION AND PRODUCTION As a manufacturer of large electrical appliances, our most important contribution is to Goal 12 – responsible consumption and production. We set high environmental standards in production and take energy and resource efficiency into account during product design. To minimise energy consumption in the manufacturing process, we prepare a detailed energy report. This enables us to identify potential savings at an early stage. We also handle chemicals and waste responsibly. We avoid unnecessary waste – even outside the production area.

13 CLIMATE ACTION The top priority for climate protection is to reduce emissions with global warming potential (GWP). Back in 1993, we were the first refrigerator manufacturer to switch to a CFC-free range of appliances. We will continue to avoid using HFOs (hydrofluoroolefins) at our production sites as long as their environmental impact has not been clearly ascertained. We also no longer use HFCs (hydrofluorocarbons). We refrain from using propellants with ODP (ozone depletion potential) and use natural refrigerants with the lowest possible GWP.

Another important step is the reduction of CO₂ emissions in production. We have set ourselves ambitious goals for this and have already achieved a great deal. For example, we switched to green electricity at our site in Lienz (Austria) already in 2014 and at our site in Ochsenhausen (Germany) in 2018. This enabled us to significantly reduce our CO₂ emissions. By 2030, we want to become climate neutral at our European production sites in Scopes 1 and 2. This will further reduce the CO₂ footprint of our appliances.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE With over 60 years of expertise in refrigeration and freezing, innovation is our constant driving force. We are constantly researching new technologies to develop appliances that are even more energy-efficient. We also continuously investigate potential solutions for alternative material solutions that are even more environmentally sound. In doing so, we take current and future end-of-life scenarios into account. With our energy-efficient appliances we contribute to a sustainable infrastructure. We also participate in research projects such as “Circular by Design”. In this way, we aim to optimise not only energy efficiency but also resource efficiency – and pave the way for a circular economy.

6 CLEAN WATER AND SANITATION By optimising and reducing water consumption at our sites, we take the utmost care of that precious resource. We implement procedures to minimise and – where possible – avoid environmental pollution.

7 AFFORDABLE AND CLEAN ENERGY To make affordable and clean energy possible for everyone, we invest in the research and development of sustainable technologies. We also support research projects in these areas. The aim is to reduce energy consumption and continuously increase energy efficiency.

8 DECENT WORK AND ECONOMIC GROWTH As a responsible manufacturer, we offer decent working conditions and long-term economic stability as a matter of course. We offer our employees secure jobs with good conditions and opportunities for co-determination. We respect trade unions and collective bargaining agreements. We do not tolerate negligence of human rights in our plants or at our suppliers.


3 GOOD HEALTH AND WELL-BEING The good health and well-being of our employees are important to us. This is why our sites have established their own company health management programmes and actively support employees in preventive healthcare. Occupational safety and emergency preparedness and response are continuously adapted to new requirements.


4 QUALITY EDUCATION We promote high-quality education, and encourage life-long learning among our employees, trainees, students and schoolchildren. To this end, we cooperate locally with a wide range of educational institutions and actively support them. We offer our employees numerous measures for personnel development.


5 GENDER EQUALITY Gender equality is a matter of course for us. We reject all forms of discrimination. In particular, we support programmes designed to inspire girls to take up technical professions. We also want to increase the proportion of women in management positions.


10 REDUCED INEQUALITIES The promotion of equal opportunities contributes to sustainable economic growth and strengthens social cohesion of a society. Through our international activities, we help reduce inequalities.


Use phase


- 

We support sustainable cities and communities by making products with the lowest possible energy consumption. We offer specific solutions for local requirements by adapting the product design. Our freshness technologies ensure that less food is wasted and thrown away – which also makes cities and communities more sustainable.
- 

The period when our refrigerators and freezers make their greatest contribution to reducing the CO₂ footprint is when they are in use. For highly energy-efficient appliances, almost two-thirds of total CO₂ emissions occur during this phase. For less energy-efficient appliances this proportion is much higher. In this way, we greatly support our customers in their desire for more sustainable consumption by helping them avoid food waste with smart solutions for better storage management. Where we can, we also remove market barriers that encourage wasteful consumption.
- 


We contribute towards climate protection with our appliances, which are highly energy-efficient during their use phase. We achieve this by ensuring low energy consumption throughout service life of the appliances. We are also expanding our knowledge and capacity to combat climate change.
- 


Our energy-efficient appliances reduce electricity consumption.
- 


We support the good health and well-being of our customers by providing the best possible refrigeration technology. This technology helps keep groceries fresh for longer, making it easier to enjoy a healthy, balanced diet without wasting food.
- 


Storing groceries under optimal climatic conditions is an important contribution to preventing food waste.

Repair and disposal

- 


For responsible consumption it is important that appliances are easy to repair and last as long as possible. For some time now, we have offered at least 10 years' availability for spare parts. We test the functional parts of our products for a service life of at least 15 years. This can delay the time until our appliances finally have to be disposed of. We also constantly optimise our equipment design to make repairs easier for our service technicians. This helps us minimise the environmental impact.
- 

The very long service life of our appliances contributes to climate protection. We support campaigns to increase the collection rate for used electrical appliances in order to increase resource efficiency and recover valuable raw materials.
- 

We support our customers with a high-quality repair service and long-term availability of spare parts. We meet all the requirements of the EU Ecodesign Directive.
- 

With our durable products, we ensure less (electrical) waste – and thus promote the sustainability of cities and communities. We also support campaigns to increase the collection rate of used electrical appliances.

Recycling

- 


Recovering valuable raw materials also contributes to climate protection. By disposing of harmful substances correctly, we keep the environmental impact as low as possible.
- 


We work closely with recyclers to improve the recovery rates of raw materials. This is a way of getting ever closer to a circular economy. We also support research projects to improve resource efficiency – for example “Circular by Design”.
- 


Our fair employment contracts ensure decent work and economic growth for everyone involved. We only work with selected recycling companies.
- 


Through joint projects with partners from the recycling industry and selected companies in the value chain, we are working on optimising current recycling processes. This way, we aim to use more and more recycled material in future.

Supply chain

- 

We also contribute to climate protection by avoiding harmful substances and developing green alternative materials. In addition, we minimise the number of transports and the associated emissions.
- 

We ensure compliance with human rights due diligence obligations all along the supply chain. In this way, we support decent work and economic growth for all. We monitor the entire supply chain for conflict minerals, for example, and for child and forced labour. Our Code of Conduct demands fair contracts with our suppliers.
- 

We pay attention to the sustainable purchase of production materials and check whether fundamental environmental and social standards are observed. We ensure that our purchased materials meet the REAcH and RoHS compliance standards.
- 

We support development towards greater sustainability by entering into partnerships with involved organisations – on the global, regional, national and local levels. In new relationships with suppliers and when intensifying existing cooperations, we formulate common goals that increase our contribution to achieving our sustainability goals.

At least
10 years
availability of spare parts

High
recyclability
of materials

Functional parts are tested
for a service life of
15 years

Smaller carbon footprint through
high energy
efficiency

Research
into increasing resource efficiency

REACH, RoHS
and food
conformity



Products

With our durable, energy-saving and resource-efficient products, we want to make a contribution to a sustainable economy and lifestyle.



6.1 Environmentally compatible product development

[416-1] We take environmental aspects into account at an early stage of product development, for example by using only the latest technologies. Our internal processes and procedural descriptions ensure that:

- New products are developed in the most environmentally friendly way possible
- Environmentally relevant aspects are considered in design, manufacture, use and disposal
- There is compliance with prohibitions or restrictions on certain substances
- The requirements for contact with food and, if applicable, drinking water are fulfilled
- All necessary documentation obligations are met
- We check how series products can be further developed to be even more environmentally friendly

In order to improve the recyclability of used appliances, we are in regular contact with our disposal service providers. At the same time, we commission and evaluate recycling studies. The resulting insights are directly integrated into appliance development. We also use life cycle analyses, life cycle assessments and product carbon footprint analyses. We want to offer the highest possible level of product safety for our customers and for the environment. This is why the materials and components of our appliances undergo comprehensive tests and endurance trials.

We have created our own processes to ensure that we comply with substance bans and guarantee food conformity. First, we define the requirements for our suppliers with regard to products and materials. The suppliers must confirm to us that each article complies with the requirements. We check that this information is correct using the documentation sent to us and through internal and external analyses. No product goes into series production until it meets all the requirements.

There are many substance bans and restrictions that we must observe. Most important, however, are the European RoHS Directive and REACH Regulation.

The restrictions of the RoHS Directive only apply to electrical equipment. Initially, the directive regulated four heavy metals and two groups of flame retardant. Following an amendment, the use of four plasticisers (phthalates) has also been restricted since 2019. Although this sounds straightforward, the procedure is much more complex and is monitored internally by a separate process. End customers within the EU can easily find out about RoHS conformity by looking at the CE mark.

The REACH regulation is much more comprehensive, regulating the placing on the market and handling of chemicals in the EU. In addition to various bans and restrictions on substances, it also defines obligations to provide information to both commercial and private customers.



Information according to Article 33 of Regulation (EC) No 1907/2006 (REACH)

This article stipulates that any supplier of a product must inform its customer if the delivered product contains a “substance of very high concern” in concentrations of more than 0.1% weight by weight. The abbreviation for these substances is “SVHC” (substance of very high concern). The SVHCs are published in what is known as the candidate list, which is updated twice a year. It is available at: [Candidate list](#)

Note that these substances are not prohibited: the customers simply have to be informed about them. It is specified that customers have to receive a response to their enquiry within 45 days. However, our customers can immediately find out for themselves on our website whether their appliance or spare part contains SVHCs. The information is available at: [SVHC query form](#)

6.2 Effect of the use phase on the life cycle assessment

The product carbon footprint of a refrigerator and freezer is significantly influenced by the use phase – this has been clearly proven by several studies.

With a useful life of 15 years in round-the-clock operation, up to 90 % of the ecological footprint of an appliance that is only averagely energy-efficient can be attributed to its operation. A major reason for this high percentage, mainly in the commercial sector, are various product features requested by the customers. These customised features may reduce the insulating effect of the appliance. However, when the appliances run on climate-friendly energy, this share is reduced to a marginal percentage. This means customers greatly influence the carbon footprint of their refrigerator or freezer by carefully choosing their source or provider of electricity.

With very energy-efficient appliances, the environmental performance is much better. Their use phase only accounts for around 60 % of the CO₂ footprint. The production of the appliance, including the manufacturing and material transport, accounts for 40 %.

By continuously improving the energy efficiency of the appliances, we will reduce the impact of the use phase even further in the future – with lower CO₂ emissions overall.

The choice of energy efficiency class for an appliance therefore has a decisive influence on its environmental footprint.

6.3 Widest product range of energy-efficient appliances

Due to the major influence of the use phase on the environmental impact caused by domestic and commercial appliances, the energy consumption of the appliances is decisively important. Energy efficiency has therefore long been a priority for us and for our customers. This is particularly important in view of rising energy costs and climate change.

In recent years, we have continuously improved the energy efficiency of our domestic and commercial appliances – above all through measures to improve the refrigeration components:

- Efficient speed-controlled compressors
- Optimisation of refrigeration components
- Use of highly insulating materials
- Further development of precise electronic controls

An example of the insulation materials are the high-quality and durable vacuum panels that we use. These do not take up much space and help ensure that unlike many other insulation materials currently in use, energy consumption remains low, even after years of use.

But there are plenty of other details, some very small, that make the crucial difference to a Liebherr appliance in terms of efficiency. For example, there are the many energy-saving modes such as EnergySaver, which raises the default temperature to 7°C. Another is HolidayMode, which only cools the essentials when you are away on holiday. And there is even CleaningMode, for energy-efficient appliance cleaning.

The online tool of the EU-funded projects LABEL2020 and BELT shows just how well our products for the private and commercial sectors perform. At this [website](#) you can view and compare the electricity consumption and plenty of other product data for electrical appliances. The calculator also takes regional electricity prices into account and indicates the running costs.

6.4 New EU energy label for domestic appliances since 2021

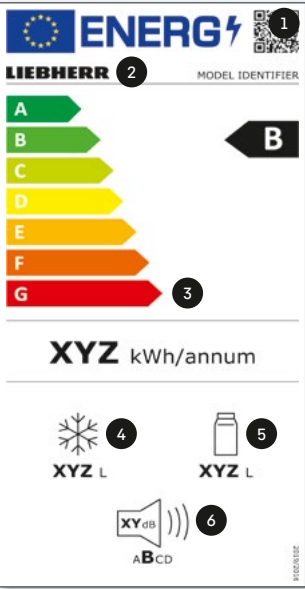
The new EU energy label officially introduced on 1 March 2021 makes it easier to distinguish between efficient and inefficient appliances. With the reform of the energy label, appliances are again distributed more broadly and clearly on the efficiency scale from A to G. Another intention of the new label was to leave the upper categories unoccupied for now in order to allow room for further innovations.

More information about the new energy label is available on the official website of the European domestic appliance association APPLIA: www.theenergylabel.eu

The energy label has significantly changed, both in terms of the efficiency classes and the type and scope of other information provided. The QR code with a link to EPREL (the European Product Database for Energy Labelling) is also new.

The new energy efficiency classes cannot simply be derived from the old label. They require a complex calculation which incorporates various factors that can positively or negatively affect the result. These factors include the type of appliance, the operating principle, the number and size of storage compartments, and special features such as automatic defrosting.

This is what the new EU energy label for refrigerators and freezers looks like:



1. QR code for identifying the product in EPREL (European Product Database for Energy Labelling)
2. Model identifier for manual identification of the product in EPREL using the article number, for example
3. The new efficiency scale from A to G. However, G is only intended for wine cabinets.
4. Volume of all freezer compartments in litres
5. Volume of all refrigerator compartments in litres
6. The noise level is now also classified into classes A to D.

6.5 Product labelling

[417-1/2/3] All Liebherr refrigerators and freezers manufactured for the European market are marked with the EU energy label at the plant. Each appliance is also supplied at the plant with its own unique serial tag, which clearly provides additional information about the production period and location.

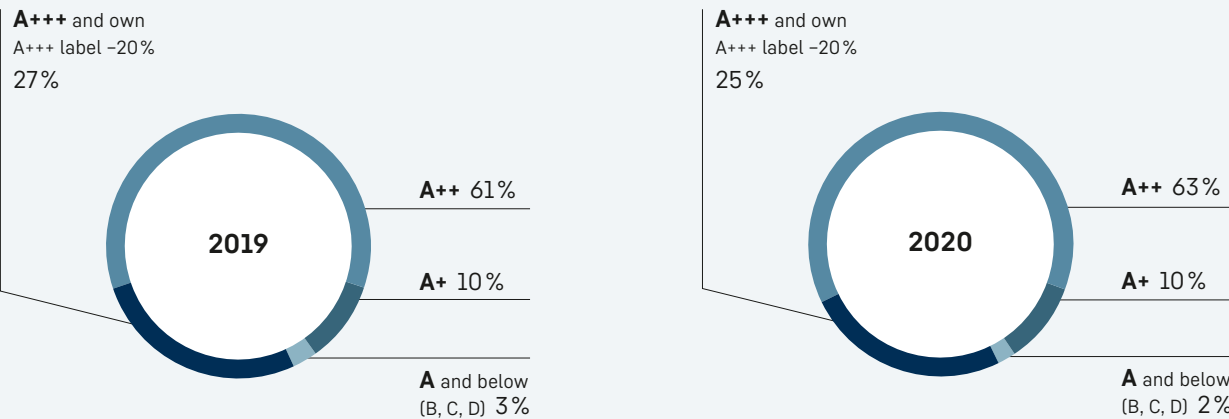
In addition, all appliances come with an instruction manual. Since the introduction of the new generation of fully integrated appliances in 2021, this has been a concise “Quick Start Guide” to conserve resources. Comprehensive instructions and all other documentation are available online so that all the information can be retrieved if the documentation is lost.

The instruction manuals cover all safety-relevant aspects for the use and proper disposal of used appliances and packaging. They also provide tips on how to save energy and how to store goods correctly.

There were no violations of the labelling requirements and associated communication during the reporting period.

Percentage distribution of appliances according to the EU energy labelling law up to 28 February 2021

(by number of appliances)



6.6 The EPREL product database

The European Commission launched an electronic database for energy-related products in 2019: [EPREL](#) (European Product Database for Energy Labelling)

The database lists all the refrigerators and freezers that are available on the market. It contains all relevant information on the appliances: for example manufacturer data, model identification and efficiency classes. This creates maximum transparency and a good basis for retailers and consumers to compare products – including their sustainability.

The most environmentally friendly products on the market can be filtered out more easily using EPREL.

In addition to the public section, the product database also has a non-public section, known as the conformity section. In addition to the declaration values, it lists information on measured values. This section is subject to strict security precautions and is only accessible to the market supervisory authorities and the European Commission.

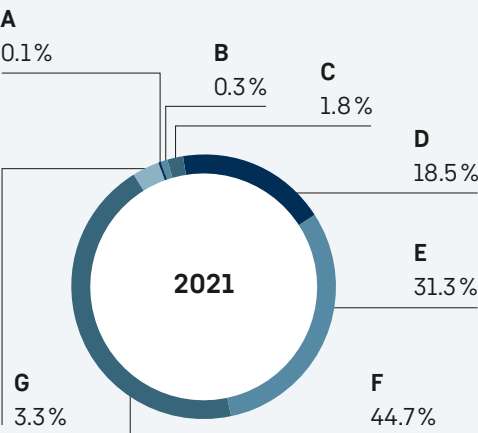
6.7 Innovations for low energy consumption

[302-5, 417/103, 417-1] Over the last two years, we have continually reduced the energy consumption of our appliances through consistent innovation. The reporting year 2021 was characterised in EU countries by the switch to the new energy label and the resulting dynamic.

Liebherr refrigerators and freezers are traditionally known for their high energy efficiency. The switch to the new EU energy label was therefore a welcome motivation for Liebherr-Hausgeräte to further improve and develop energy-saving technologies. End consumers benefited greatly from our fast innovation cycles. For example, the built-in and freestanding appliance series introduced in 2021 had already been developed with the requirements of the new EU energy label in mind. As a result, these appliances are top of the efficiency ranking. We are continually adding further energy-efficient models to our uniquely wide range of refrigerators and freezers, because we want to continue occupying the top positions in these product segments in future. Examples are the [ICBb 5152 Prime BioFresh](#) fridge-freezer and the [IRBb 4170 Peak BioFresh](#) refrigerator in energy efficiency class B and the [CBNsdb 5753 Prime BioFresh NoFrost](#) upright fridge-freezer, also in energy efficiency class B.

Percentage distribution of appliances according to the EU energy labelling law as of 1 March 2021

(by number of appliances)



Another current example is the Liebherr SiBa 3950, a full space BioFresh refrigerator that is in the highest energy efficiency class A.

Since 2016, the BluPerformance generation of freestanding appliances has shown that there is no need to choose between energy savings and comfort. In 2019, these appliances were all in what was then the best efficiency class A+++ or even up to 20 percent more economical. Moving the refrigeration technology into the appliance plinth has made new component layouts possible.

Since then, we have standardised the BluPerformance technology. The new generation of freestanding appliances launched in 2022 still utilise the advantages of BluPerformance, combining high energy efficiency with maximum capacity and minimum operating noise.

6.8 What we do for efficient appliances

Refrigerators and freezers are in use around the clock and are responsible around 15% of the electricity bill. The new generations of Liebherr appliances launched during the reporting period consume little energy and thus conserve our environment's precious resources.

At all our sites, the development and engineering departments work on this in state-of-the-art development centres. They make our appliances increasingly efficient – for example with cutting-edge electronics and optimised refrigeration circuits. When it comes to new equipment features, they focus on making life easier for customers, optimising food storage, reducing consumption and keeping operating costs low. It is therefore no coincidence that Liebherr appliances are at the top of the energy efficiency scale in many relevant product segments.

6.9 Features for economical consumption

Efficiency at all levels

To maximise energy efficiency, we aim to fully utilise the savings potential of every single appliance component. This applies to materials, functional parts, features and the electronic control system which ensures optimum interaction.

Insulation

Good insulation is an essential factor in saving electricity. It ensures that the cold stays where it belongs: inside the appliance. We are constantly developing our insulation materials and working on new compositions. We optimise the insulation properties to maximise the capacity of the appliance while maintaining an effective insulation layer.

To do this, we use durable, high-quality vacuum panels. These do not take up much space and unlike many other insulation materials currently in use, help ensure that energy consumption remains low even after years of use.

VCC compressors

The new compressors use state-of-the-art electronics to ensure that the appliances are particularly energy-efficient. Because they run at low speed, they cause very little noise and vibration. The high performance of the compressors allows rapid cooling as soon it is required.

Plinth technology

In BluPerformance appliances, the cooling technology is compactly integrated in the appliance plinth. This means the condenser is no longer on the back of the appliance and the evaporator is no longer on the compressor. This creates space for a much larger usable volume. The appliances are ventilated from the front, which means they can be installed in a row of kitchen units. We call this InteriorFit.

Precise control

State-of-the-art electronics ensure that all our refrigerators and freezers only use the energy that is actually required. Temperature sensors measure both the internal and the ambient temperature. The control system adjusts the speed of the compressor accordingly. It also detects the door being opened and switches off the fan. If the door is open for more than 60 seconds, an alarm sounds. This also protects frozen food.

DuoCooling

All our combined fridge-freezers, in other words the appliances where these two parts have their own temperature control systems, have DuoCooling. That means that the refrigerator and freezer compartments are not connected by an opening, so no air is exchanged between them. The advantage is that DuoCooling prevents food from drying out, keeping it fresh for longer. It also stops smells from stored food passing from the freezer compartment to the refrigerator compartment and vice versa.

NoFrost

Regular defrosting saves electricity. With the NoFrost function, this takes place automatically. As soon as the evaporator builds up a layer of ice, a sensor initiates the defrosting process. The fan switches off, the evaporator tubes are heated and the ice layer melts without increasing the temperature in the freezer compartment. This keeps the appliance ice-free and its energy consumption constant.

LED lighting

There is no getting around LEDs when it comes to energy-saving lighting. They combine long service life with high performance and low consumption. We have developed our own LED lighting concept that both saves energy and pleasantly illuminates the interior.



CleaningMode

Until now, when cleaning the refrigerator, customers have always had to choose between turning it off to save energy or leaving it on for light and a better view inside. CleaningMode helps by switching off the refrigeration while leaving the lighting on.

InteriorFit

Our new freestanding refrigerators fit perfectly into a 60 cm deep niche. Only the door protrudes by a defined distance, ensuring optimum access to the recessed grip or lever handle. To ensure that energy efficiency is in no way impaired by this attractive design, these appliances are still efficiently ventilated from the front.

EnergySaver

The EnergySaver function slightly increases the preset temperature to reduce energy consumption.

HolidayMode

Owners of fridge-freezers often want to switch off the refrigerator compartment but leave the freezer compartment on when they go on holiday. To prevent odours when the door of the refrigerator compartment is closed, Liebherr BioFresh Premium appliances are equipped with HolidayMode, which regulates the refrigerator compartment temperature to 15 °C. This effectively prevents odours when the door is closed, but the appliance requires much less energy than in normal mode.

SmartGrid-ready

All appliances that can be integrated into intelligent grids with a retrofitted module are SmartGrid-ready. The principle is that at times when the electricity price is low, the freezer creates cold reserves that are released during more expensive hours. The appliance also automatically selects and uses the most favourable electricity tariff. This way, electricity costs can be reduced by up to 10 %. Smart grids are still future projects, but SmartGrid-ready appliances are already prepared for them today.

6.10 How we extend product life

Liebherr-Hausgeräte has been manufacturing high-quality refrigerators and freezers since it was established in 1954. Our traditional high quality is apparent even in the smallest details. For example, before we approve a door hinge, it has to go through at least 100,000 opening cycles. This is equivalent to more than 15 years of use. We also test all other functional parts to ensure that they can last just as long. At the same time, we make sure that each of our appliances is as easy as possible to repair and, if necessary, can be quickly and effectively restored to operation with the help of our nationwide network of premium service partners (see 6.20 “Service and support”).

This a reason why Liebherr welcomed the new Ecodesign Regulation, which came into force with the new EU energy label on 1 March 2021. The aim is to significantly reduce the consumption of energy and resources in Europe. An important cornerstone of this is the extension of product life. For example, manufacturers must now keep essential spare parts in stock for either seven or ten years, depending on the product or whether it is a private or commercial repair. It must also be possible to replace the spare parts using commercially available tools. This is intended to simplify repairs and motivate consum-

ers to use the devices for longer. Liebherr expressly endorses this approach – we have always been committed to product quality and durability. We run tests to ensure all functional parts have a 15-year service life. Many points in the new regulation have been a matter of course for us for years. For example, our spare parts are guaranteed to be available for ten years, and every appliance is very easy to repair. In addition, all operating instructions for customers and service engineers are available free of charge on our Liebherr website.

The regulations at a glance

The spare parts must be:

- Kept in stock for seven years (door seals for ten years)
- Replaceable using commercially available tools
- Accessible to all service providers (service documents must also be provided)
- Accessible to end users
- Delivered within 15 working days
- Available online For some countries there is already an online shop for end customers and the Liparts 2.0 platform for technicians.
- In addition, operating instructions must be easily accessible.

6.11 Avoiding food waste

Shelf life is all about technology. Liebherr has developed innovative freshness technologies and has continued to refine them in the new generations of appliances. This is because keeping groceries under optimal climatic conditions is an important contribution to preventing food waste.

- DuoCooling is our basic technology in all fridge-freezers. Two completely separate cooling circuits ensure that there is no air exchange between the refrigerator and freezer compartments. The food does not dry out or spread odours.
- Our EasyFresh safe is suitable for loose fruit and vegetables. Sealed airtight in the safe at the same temperature in the refrigerator compartment, the food stays fresh for a long time.

- With the proven BioFresh technology, foodstuffs can be stored at temperatures just above 0°C, which is significantly cooler than in the rest of the appliance. With the perfect humidity, fruit and vegetables stay fresh even longer in the airtight Fruit & Vegetable safe. Meat, fish and dairy products are optimally stored in the Meat & Dairy safe.

- Other special compartments are even more individually adapted to the requirements of specific groceries. The Fish & Seafood safe, for example, keeps fish and seafood fresh for twice as long as even the BioFresh Safe does. In the BioFresh Professional safe with HydroBreeze, fruit and vegetables are covered by a cold mist.

By extending the shelf life, these technologies help reduce avoidable food waste.

6.12 Storing groceries correctly

Our compartment labelling helps our customers store their groceries optimally in the refrigerator. In accordance with the Ecodesign Directive, the various climate zones in the appliance are marked with pictograms. This makes it easy to see at a glance which food is best stored in which zone of the refrigerator. More infographics and information on the storage zones can be found in [FreshMag](#), our online magazine. It is also an example of how we want to use targeted communication and marketing measures to help consumers make the best possible use of technological options.



[Storing food correctly – what goes where in the fridge? FreshMAG \(liebherr.com\)](#)



6.13 The new noise classes

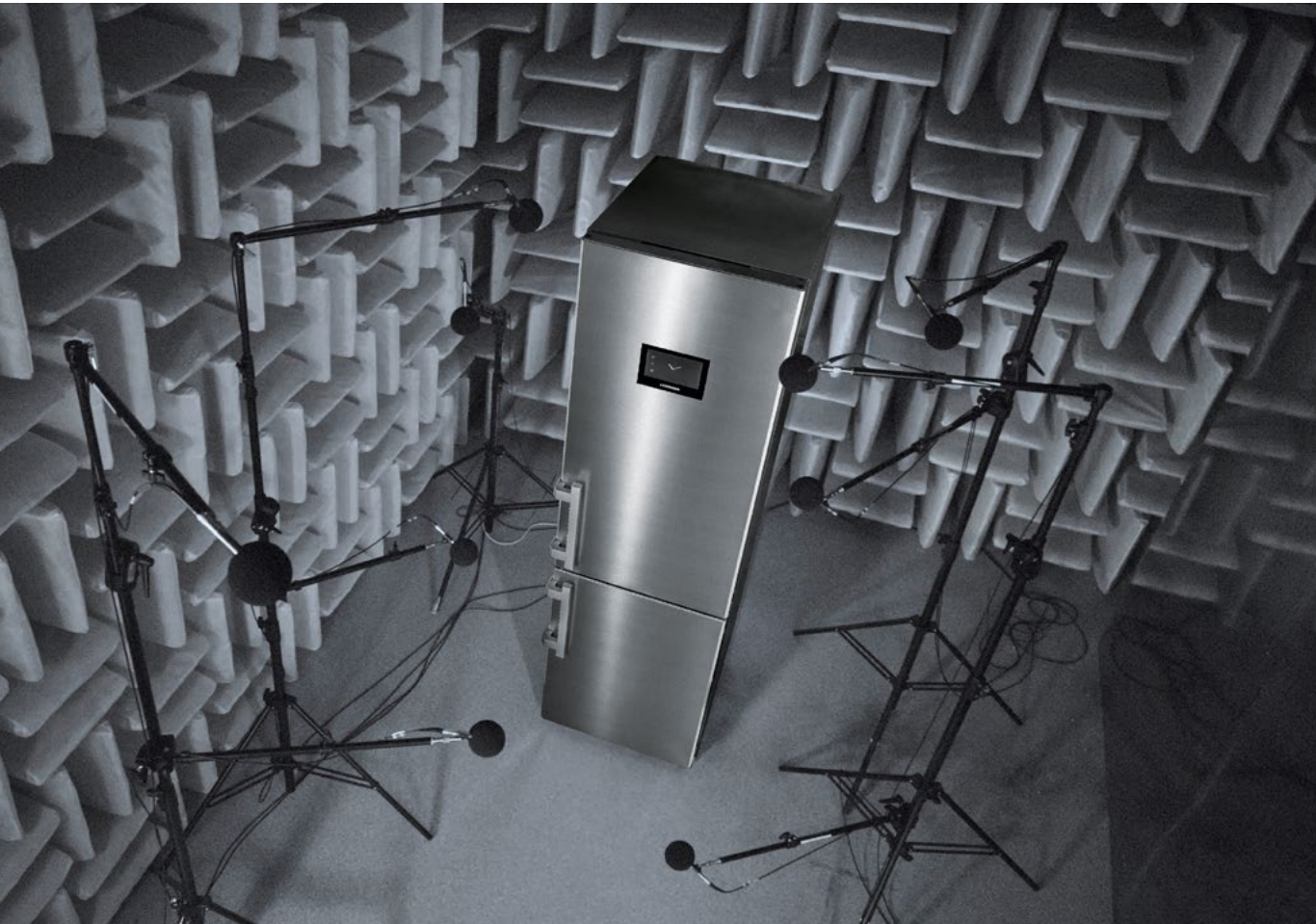
Along with the new energy efficiency classes, noise classes have been introduced for refrigerators and freezers. In addition to the dB(A) noise value already shown, the new energy label also indicates the noise class: A, B, C or D. Similar to the efficiency classes, A stands for particularly good – in other words, particularly quiet. D stands for relatively noisy.

Today’s ways of utilising living space mean that the noise made by a refrigeration appliance is increasingly important factor in deciding which one to buy.

The boundaries between the kitchen and living areas are becoming more blurred in modern households. Any noises are thus heard in completely new situations: for example, when reading on the couch or working from home.

This is why our new range of freestanding and fully integrated appliances offers a wide range of extremely quiet appliances. Some of the latest fully integrated appliances are as quiet as 29 dB. For freestanding appliances, the best value is 32 dB.

To safeguard this progress, we test our appliances in state-of-the-art acoustic chambers. The result of 40 years of acoustic development is that our appliances also occupy the top positions in the new noise classes.



In professional sound measurement rooms, engineers use highly sensitive microphones to listen very carefully to sound emissions and further optimise the sound quality of moving components such as doors and pull-outs.

6.14 Commercial appliances and energy labelling

General requirements for commercial refrigerators and freezers

In many areas of the hotel and catering sector, the storage refrigerators and freezers that are used have a high energy consumption. More than 20 years after the introduction of the EU energy label for domestic appliances, the labelling has now been extended to the commercial sector. This gives customers important information about the efficiency and energy consumption of the refrigerators before they buy them, thus making consumption a specific quantity that can be calculated. The information on the energy label classifies the appliances according to their energy efficiency and expected power consumption. The European Commission wants to reduce energy consumption in the European Union and promote the sale of energy-efficient appliances. For this reason, the following regulations were issued on 1 July 2016:

- 2015/1094-IV “Energy labelling of professional refrigerated storage cabinets”
- 2015/1995-IV “Ecodesign requirements for professional refrigerated storage cabinets”

According to these regulations, refrigerators and freezers with solid doors designed for storing food in a commercial environment must be marked with an energy label. Some appliances are exempted from the obligation, such as:

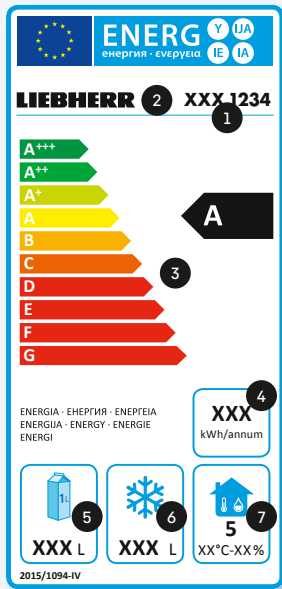
- Appliances with static cooling (i.e. without a fan)
- Fridge-freezers
- Chest freezers

The appearance and content of the energy label are based on the familiar label for appliances. In addition to information on the manufacturer, product name, energy efficiency class and energy consumption in 365 days, the energy label must also contain information on the net capacity and the climate class. Regardless of the climate class indicated, the energy consumption is measured for all affected appliances in climate class 4 (+30 °C ambient temperature / 55% relative humidity).

The energy efficiency classes have ranged from A to G since 1 July 2016. However, this has confused many retailers and customers, because they are used to the energy efficiency classes A+++ to D for domestic appliances. The reason for this is that the test conditions for commercial and domestic appliances are very different. The additional classes A+, A++ and A+++ were introduced on 1 July 2019.

The energy label displays the energy consumption and energy efficiency of a specific product. To determine these classifications for commercial products, the appliances are tested under the conditions of a professional kitchen. Due to these very different test conditions, the energy classes and the kWh/year value are not comparable between commercial and domestic products.

The energy label for commercial refrigerators and freezers:



1. Supplier's model identifier
2. Name or trademark of the supplier
3. Energy efficiency class
4. Energy consumption in 365 days
5. Net capacity of refrigerator compartment
6. Net capacity of freezer compartment
7. Climate class (3, 4 or 5)

Measurements:

Approved climate classes

Climate class 3 (light-duty cabinet):

Ambient temperatures from +10 °C / +16 °C to +25 °C, 60 % relative humidity

Climate class 4:

Ambient temperatures from +10 °C / +16 °C to +30 °C, 55 % relative humidity

Climate class 5 (heavy-duty cabinet):

Ambient temperatures from +10 °C / +16 °C to +40 °C, 40 % relative humidity

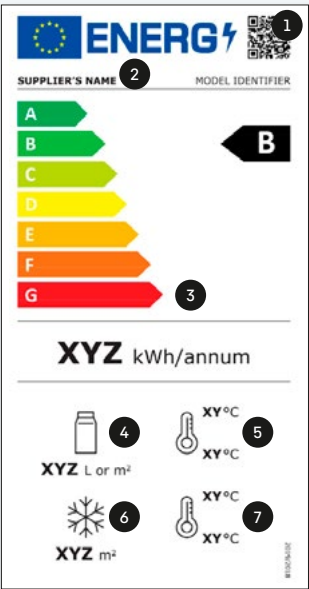
The climate class shown on the energy label reflects the maximum ambient temperature at the place where the appliance is used. At this ambient temperature, the storage temperatures required for groceries are maintained.

Energy consumption / net capacity

The energy consumption is measured for all appliances, regardless of their indicated climate class, at climate class 4 (+30 °C / 55 %rH). The measurement of energy consumption is subject to the EN 16825 standard and regulation 2015/1094-IV. The net capacity is determined according to the EN 16825 standard.

The regulation now includes labelling requirements for refrigeration appliances with a direct sales function. Since 1 March 2021, beverage coolers, ice cream freezers (such as ice cream chests) and supermarket refrigerated display cases must be labelled in accordance with the new EU regulation.

The new energy label for refrigerators with a direct sales function:



1. QR code for identifying the product in EPREL (European Product Database for Energy Labelling)
2. Model identifier for manual identification of the product in EPREL using the article number, for example
3. Scale of energy efficiency classes from A to G
4. Total display area in square metres (refrigeration)
5. Upper cooling temperature: highest compartment temperature in degrees Celsius. Lower cooling temperature: lowest compartment temperature in degrees Celsius.
6. Total display area in square metres (freezing)
7. Upper freezing temperature: highest compartment temperature in degrees Celsius. Lower freezing temperature: lowest compartment temperature in degrees Celsius.



As part of our internationalisation strategy, we will also comply with international labelling requirements. For example, our products are labelled with the Energy Star, a US environmental label for energy-efficient appliances. The Energy Star certifies that electrical equipment meets the energy efficiency criteria of the EPA and the US Department of Energy. In 2003, the Energy Star was officially recognised in Europe by an EU regulation.

Important criteria for the Energy Star include:

- An appliance or component that is switched on switches down after a certain time.
- The appliance meets the criteria for the maximum permissible energy consumption over a specific period of time.

We also fulfil the labelling obligation according to California Proposition 65, a law that requires every product sold in California to carry a warning label if it contains any of more than 900 chemicals that California regulators deem potentially harmful. We do this even though there is no indication that our products are harmful to health as long as they are used as intended.



6.15 Customer centricity

To enable our specialists in every department to take the needs of our customers into account as early and as comprehensively as possible in their processes, these needs are regularly identified and evaluated. This is done using surveys with representative groups of customers. In 2020 and 2021, more than 20,000 end customers and business partners worldwide were surveyed quantitatively and qualitatively. At the same time, the feedback we receive through our telephone service and our sales partners is also incorporated into the development processes. We also measure customer satisfaction after repairs, which provides feedback and valuable results for the continuous improvement process. Close and long-term cooperation with our major customers is a key part in the continuing development of our commercial appliances.

We integrate our customers and the environment into product development at an early stage.

In developing our new HNGRY app, we also took the requirements and functional wishes of our customers into account in accordance with our consistent customer centricity. The app launched in Germany and Austria in December 2019. It is now

also available in Switzerland, Luxembourg, the UK, Bulgaria, Romania, Hungary, the Czech Republic, Slovakia, Slovenia, Poland, Greece, Spain, Italy and France.

HNGRY is the smart everyday helper for shopping, storage and supplies. The app helps you keep track of everything, to be optimally organised and to avoid buying things twice over, thus reducing food waste and contributing to a healthier and more conscious lifestyle. HNGRY is primarily aimed at younger people with an interest in good food, sustainability or digital assistants. Currently, the app provides a shopping list and a stores section. Smart recommendations make planning your shopping faster than ever, and the shopping list can be easily shared with family, flatmates or friends. Thanks to push notifications, all members are always perfectly coordinated. The application is completed by smart linking of the shopping list with the items already in store. Using the HNGRY app and the stores section in particular, Liebherr also conveys a lot of useful knowledge about how to store food in the refrigerator and freezer compartments, and opens up the world of optimal food storage to users.



Interested?
You can download the HNGRY app here:
<https://hngry.onelink.me/7UGF/downloadnow>



6.16 Optimising use of materials

[301-1/2/3] Various materials in different quantities are used in the individual appliance series. Metals such as steel and plastics such as polystyrene make up most of the weight.

We use single-variety plastics whenever the processing technology allows. Plastic parts weighing 50 g or more and natural and synthetic rubber parts of 25 g or more are also marked according to international standards in order to assist subsequent recycling processes. The metals we use are almost entirely recyclable. We also pay attention to the recyclability of packaging materials. We only use expanded polystyrene, polyethylene foil, plastic mouldings, cardboard and wood. For printed materials such as brochures, leaflets, price lists and magazines, we mainly use paper from sustainable forestry. When it comes to materials, our philosophy is to use as few resources as necessary and recycle as much as possible.

To further increase our resource efficiency, we are still participating in the “Circular by Design” project, which was launched in July 2019. The aim of the research project is to promote a resource-efficient circular economy. The joint project is part of an effort to support research and development projects on the theme of a resource-efficient circular economy and innovative product cycles. Here it is part of the framework programme “Research for Sustainable Development – FONA3”.

These are our research partners:

- Helmholtz-Zentrum Dresden-Rossendorf e. V.
- Helmholtz-Institut Freiberg für Ressourcentechnologie
- Wuppertal Institut für Klima, Umwelt, Energie GmbH
- Forschungsgruppe Nachhaltiges Produzieren und Konsumieren
- Folkwang Universität der Künste, department of Sustainability in Design

Our cooperation partners are Becker Elektrorecycling Chemnitz GmbH and Entsorgungsdienste Mittelsachsen GmbH.

A further goal of “Circular by Design” is the development of recyclable product design for refrigerators and freezers. This product design should not only be optimised for energy efficiency but also for resource efficiency. The aim of the

BMBF-funded project is to demonstrate that circular design is actually feasible. The focus is on repair and re-use as well as recycling paths that are as circular as possible.



Combining the resource efficiency analysis with the technology-oriented and simulation-based “Design for Recycling” model will make it possible to assess whether a planned product design is suitable for complete recycling. To do this, the project partners are quantifying the losses during the collection and recycling of a current fridge/freezer at various levels. The results so far of a large-scale practically oriented test show, for example, that many (electronic) components cannot be satisfactorily separated in the subsequent recycling process. This is because they are hard to dismantle. The large loss of raw materials is thus caused by a design process that needs improvement. The research project demonstrates feasible ways of increasing resource efficiency as well as design options to aid repair and dismantling. These allow almost complete recycling or re-use of components and raw materials.

As associated partners in the “Circular by Design” project, we provide information, technical expertise and the CNPes 4758 refrigerators and freezers as a basis for the data and for specific tests. In this way, we are helping to make the design and construction process of a refrigerator/freezer more practice-oriented. We want to find out what recycling-optimised refrigerator-freezers might be like.

The CNPes 4758 fridge-freezer combination that we have provided is a premium NoFrost freestanding appliance from the highly energy-efficient BluPerformance range. Its features include BioCool, DuoCooling and Smart Device.

The overall goal of the research project is to shed light on resource efficiency as well as energy efficiency for a widely used consumer product. We are developing various approaches to this in the concept phase. These will be supplemented by an evaluation and decision tool that can then become the standard for other consumer goods.

6.17 Use of secondary raw materials

[301-2/3, 308-2] When it comes to secondary raw materials, both public and internal expectations and requirements are very high. Plastics recycling in particular is a challenging process.

Refrigerators are recycled separately from other large household appliances. This is an advantage because it limits the variety of plastics in the recycling process. However, in the case of refrigeration appliances, most plastic materials come into contact with food. This means recycled material cannot be used without meeting certain criteria. The limits are increasingly difficult to comply with even for virgin plastics. On the one hand, this further improves safety for customers. However, many of the refrigerators that are currently recycled were made more than 20 years ago and contain plastics that are no longer compliant and are very difficult to re-use. Of course, these older appliances still pose no risk to customers or food.

In order to conserve resources, we collect as much as possible of the residues generated during the processing of the plastics. We treat these residues and return them to the production process. For steel, there is a functioning material cycle, which is why we always use secondary materials. While the use of

recycled plastic from old appliances or other waste streams is already possible to some extent for other consumer goods, there are additional restrictions on these possible uses for refrigeration appliances.

Another reason why we are not yet able to use secondary plastics is because of the fluctuating availability and quality of materials. There are particularly strict requirements for plastics used in the interior of an appliance. Food conformity, for example, cannot be achieved at present with mechanically recycled material. Nevertheless, we are of course continuing to monitor the topic, keeping a close eye on current technological and market developments. We are also in close contact with specialist institutes, suppliers and the recycling industry. Our development department is working hard on using more recycled material in our equipment as soon as possible. This is why we actively participate in relevant standardisation processes. This way, the necessary material qualities can be defined and approved for possible areas of application.



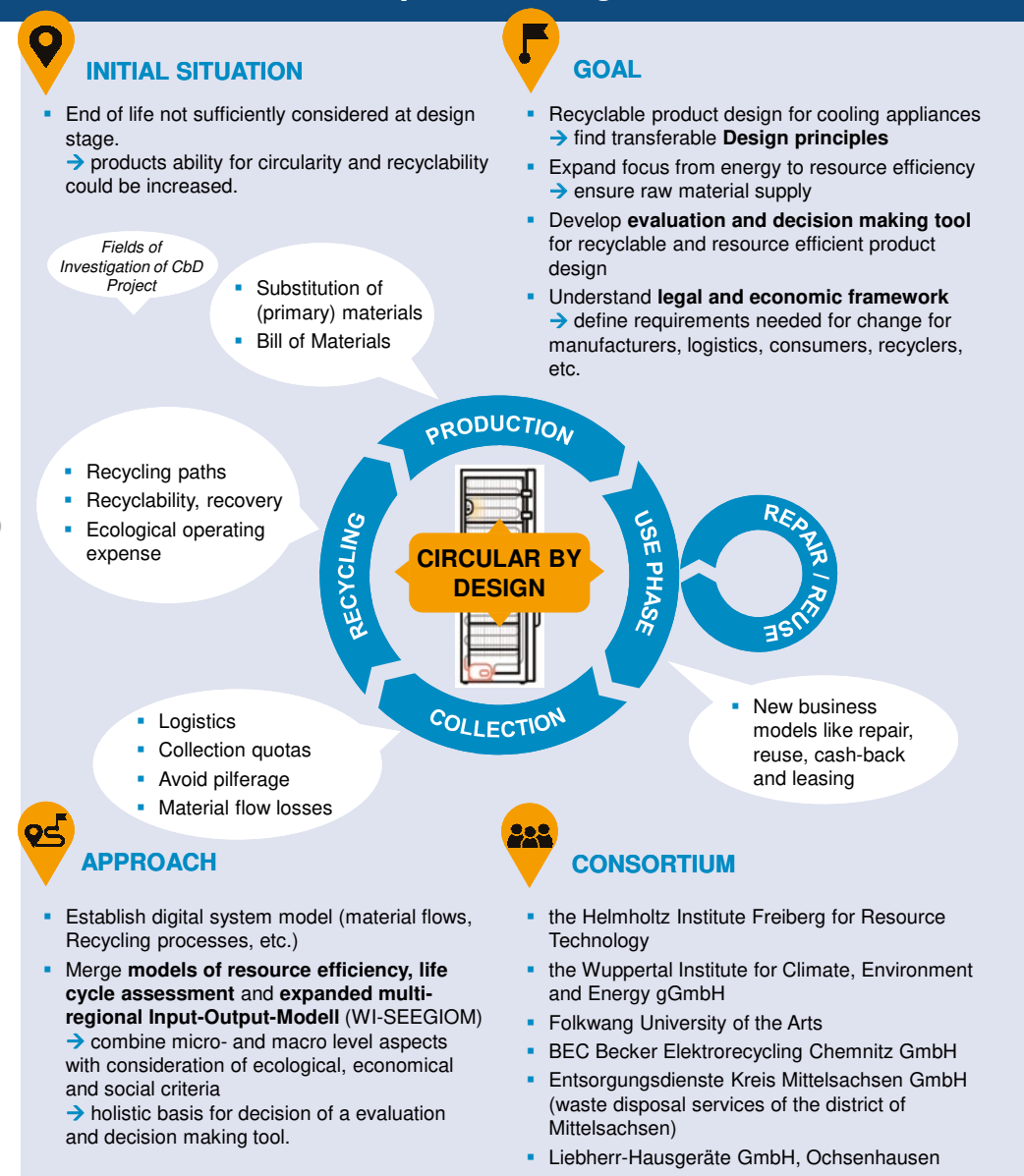
We offer the ideal solution for every application



Grant number: 033R244

Circular by Design (CbD) – Resource efficiency through sustainable design consumer goods, the example of a fridge-freezer

Circular product design and simulation-based evaluation and decision making tool



Overview of the Circular by Design research project:
[https://innovative-produktkreislaeufe.de/Projekte/Circular+by+Design+\(CbD\).html](https://innovative-produktkreislaeufe.de/Projekte/Circular+by+Design+(CbD).html)

6.18 Refrigerants and blowing agents

We use natural refrigerants and blowing agents.

Natural refrigerants and blowing agents* with minimal global warming potential are essential for protecting our climate. This is why we use the very mild refrigerants R290, R600, R600a and R170 and a blowing agent mixture consisting mainly of cyclopentane. The global warming potential of these substances, stated as GWP, is many times lower than the fluorinated hydrocarbons that are still in widespread use.

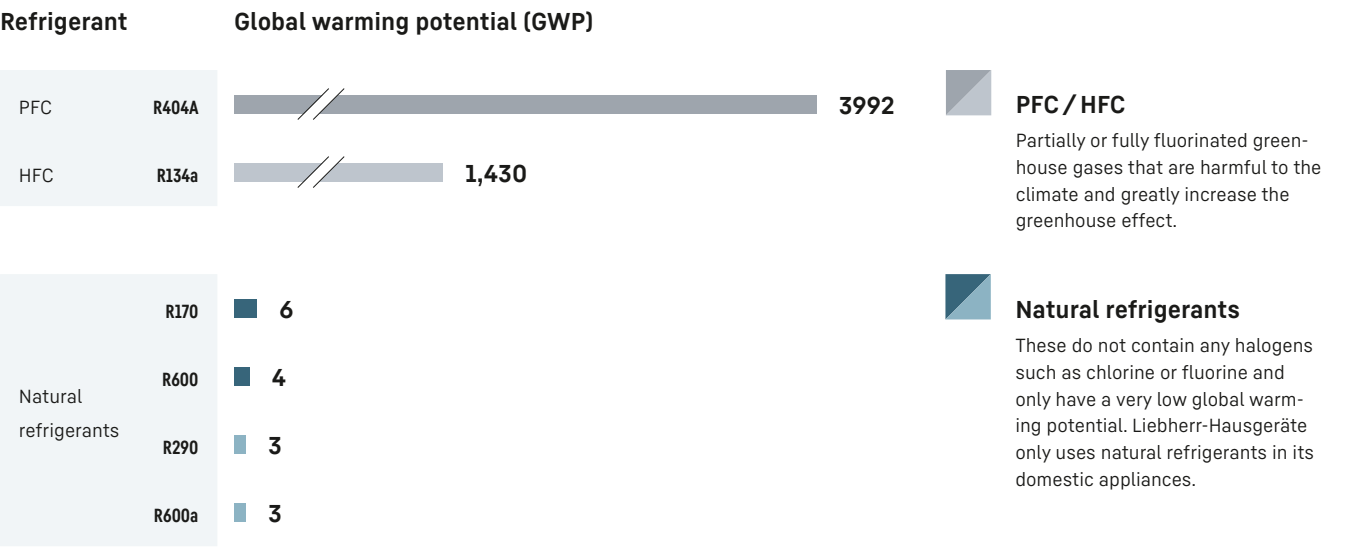
This commitment to the environment is part of a long tradition at Liebherr-Hausgeräte. Back in 1993, we were the first refrigerator manufacturer in the world to switch to a CFC-free range. Since then, we have consistently expanded the use of natural refrigerants and blowing agents and now exclusively use them at all our production sites.

While this has been the case for domestic appliances since 1996, we only began exclusively using natural blowing agents and refrigerants for commercial appliances in 2022.

This delayed implementation was due to special customer and market requirements. For example, customers in tropical countries insisted on non-flammable refrigerants such as R134a, as they were concerned about problems in the event of repairs. Nevertheless, we were able to steadily expand the use of natural refrigerants. We trained service personnel in the use of R600a and advised our customers on this climate-friendly alternative. We also stocked up on large quantities of the refrigerant, which was practically unavailable in Asia. This enabled us to gain the confidence of our customers and accelerate sales of appliances with R600a. As a result, last year only a few appliances with R404a and R134a, both of which are fluorinated hydrocarbons, came off the production line. Since 2022, we have been able to say that we use natural blowing agents and refrigerants for all our appliances without exception.

* Refrigerants are used as heat transfer media in refrigeration units. Blowing agents are used for making foams. “Natural” means that the substances occur naturally.

Global warming potential of refrigerants



Natural refrigerants have a very low global warming potential.

6.19 Durability and product safety

[416/103, 416-1/2] Refrigerators and freezers are in use around the clock. 24 hours a day and 365 days a year, they must reliably provide refrigeration and keep goods fresh and safe. As a manufacturer of premium appliances, we therefore place the highest demands on our appliances and components. Every day, we work to ensure that our appliances meet the highest standards in household and commercial use.

This also applies to the industry-specific requirements for refrigerators and freezers in bakeries and pastry shops, for example. Special cataphoretically coated evaporators are used for these appliances. They provide reliable protection against particularly aggressive and corrosive substances such as salts and fructose.

The high product quality and long service life have a great influence on the environmental performance of the appliances. Regular surveys show that our appliances – both domestic and commercial – are in use for longer than those of other brands. The refrigerator door, for example, is opened several times a day and is subjected to high loads. Therefore, before a component is used in series production, we put the functional parts, right down to the rails and hinges, through extensive endurance tests to ensure a 15-year service life. Liebherr provides a two-year manufacturer's warranty for the operation and reliability of our refrigerators and freezers and guarantees that they do not have any material or production defects. Since 2015, our end customers in Germany, Austria, Bulgaria and the UK have been able to extend the manufacturer's warranty by another three or eight years with the new WarrantyPlus certificate.

During the development and manufacturing phase, we thoroughly test all appliances for any subsequent health and safety risks to users. The development, product and quality management, purchasing and manufacturing departments are all involved in this process together. During production, all the appliances undergo extensive functional and safety tests. The results are recorded and evaluated. We also carry out product audits in which we randomly test finished appliances according to specified criteria. We regularly evaluate the key process figures as a basis for improvements. In this way, we ensure a continuous improvement process.

We test the functional parts to ensure a service life of 15 years.

In the reporting period, there were no breaches of the health and safety regulations for refrigerators and freezers. Specific internal processes have been established to deal with any threat to product safety or customer health. They immediately initiate all necessary measures to protect customers and inform the authorities and the public.

Whether under extreme temperatures or high humidity – in the climatic chambers, the appliances prove their versatility in long-term tests beyond the usual measuring periods



6.20 Service and support

We believe that reliable service affirms our customers' choice of purchase, increases their satisfaction and thus substantially contributes to long-term customer loyalty. After their purchase, our customers can access a worldwide service network with a comprehensive range of repairs and services. Clearly structured guidelines and procedures as well as a fast flow of information help our external service partners to provide customer-oriented services. The targeted and regular training courses for service professionals always include the latest environmental and disposal-related topics. An increasing number of training courses for service professionals are now available online to reduce travel expenses and ensure that the expertise is widely spread.

Our technicians can access a central documentation management system at any time of day or night. An international complaints management system promotes quick communication and effective problem solving. We believe that prompt reactions and a high level of expertise in offering initial solutions are the key factors for service quality.

Service engineers can access a spare parts ordering system around the clock. In cooperation with globally active logistics companies, we have a fast and environmentally friendly delivery service. We also offer spare parts availability for at least ten years.

We also achieve our premium standards for customer service.



6.21 Recycling and disposal of used appliances

[417-1] The Waste Electrical and Electronic Equipment Directive (WEEE) legally regulates the collection and recycling of electrical appliances in the EU. Since 2006, it has obliged domestic appliance manufacturers to take back used appliances. In Europe, we cooperate with private waste disposal companies and also use public return and recycling systems.

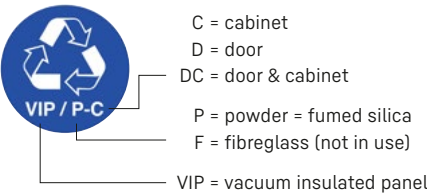
In Germany, the Electrical and Electronic Equipment Act (ElektroG III) passed the WEEE Directive into German law. This forms the basis for our activities. The German “Stiftung Elektro-Altgeräte Register” (EAR) is the executive body. It is responsible among other things for the registration of manufacturers, coordinating the provision of collection containers and the collection of old appliances.

Recycling information

In order to ensure the best possible re-use of old appliances, we are in constant dialogue with the recycling industry. Liebherr began by issuing its own recycling information. This was replaced in early 2018 by the i4R database of the domestic appliance umbrella organisation [APPLiA](#).

To improve recycling, we provide recycling companies with important information using stickers.

Since the late 2018, a blue sticker has been used to identify all appliances with vacuum insulation panels (VIPs), showing the recycling company the type of VIP and location in the appliance, because the use of VIPs is not apparent from the outside. VIPs have a significantly better insulating effect than conventional foam.



The sticker is based on research carried out by the umbrella organisation of European domestic appliance manufacturers (CECED, now APPLiA) in 2013, which tested the disposal of energy-efficient refrigerators with vacuum insulation panels in several countries. In addition, Liebherr, together with a competitor and an expert institution, carried out a further and more in-depth investigation. The focus was on the extent to which current plant technology is suitable for the future disposal of these appliances. The research found that many plants were already able to dispose of this new type of used appliance. However, some plants will still require technical modifications – for example to exhaust air and filter systems – especially if VIP appliances achieve a larger market share.



A second sticker is attached to compressors with high-viscosity oils. It is intended to ensure occupational safety in the recycling plants, because the oil must not be accidentally ingested.

Here too, direct dialogue continues in various committees and research projects. These deal with questions such as which information recycling companies need in order to more easily comply with legal requirements while further improving the quality of recycling. The aim is to re-use the output of the recycling plants with the highest possible quality.

Return of used appliances

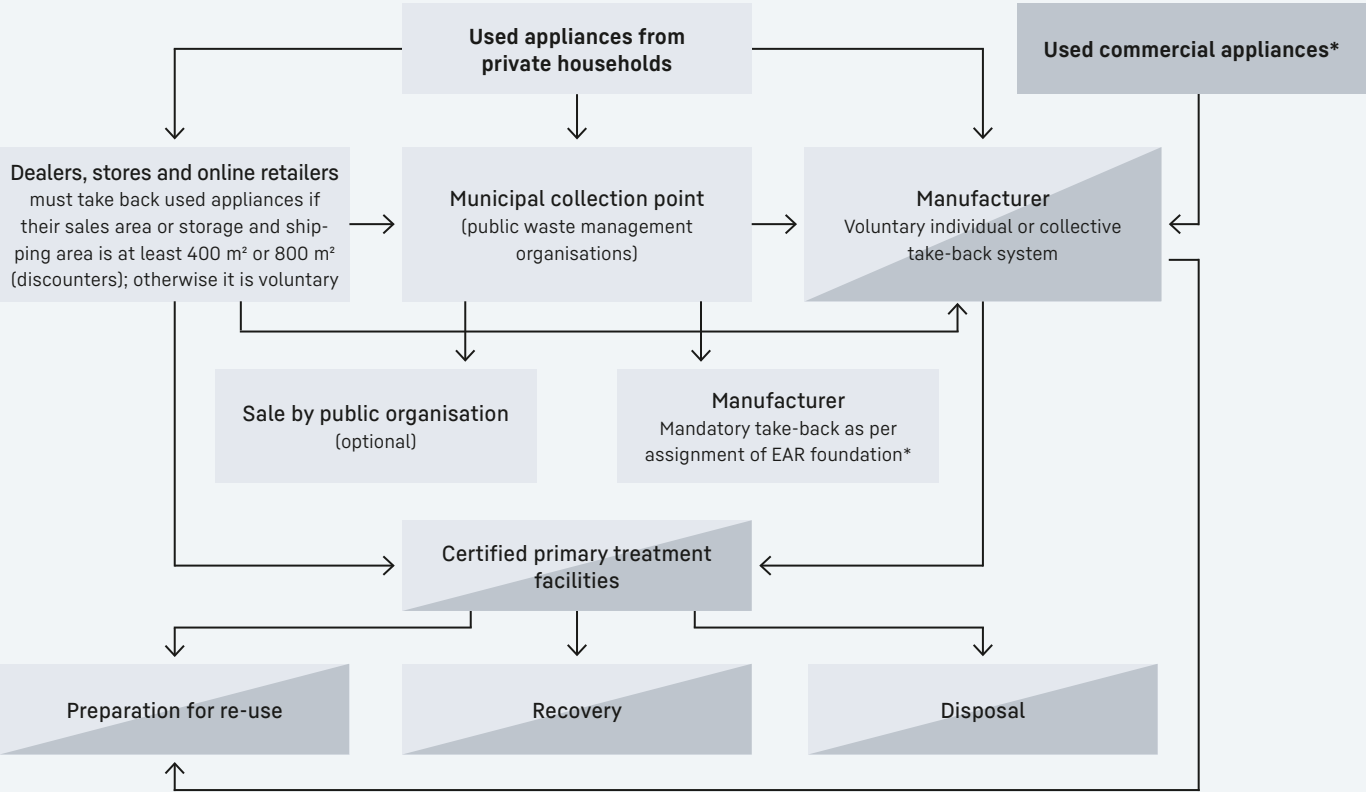
Our instruction manuals and our [website](#) inform our customers that they can return used appliances and batteries to us. In this way, we are implementing our legal obligations.

Due to the regional nature of the disposal system in Germany, a wide variety of municipal requirements apply. This is why we support regional and national information campaigns on the correct disposal of old electrical equipment, such as “[Drop it like E-Schrott](#)” in Germany. This joint information campaign by the EAR foundation and domestic appliance manufacturers is also supported by the German Federal Environment Agency.

The following illustration shows the options for returning appliances:

Process sequence

Return, recycling and disposal of used appliances
(from private households and commercial appliances) in Germany as an example, legal framework: ElektroG (2015, last amended 2021)



Opportunities for private customers to return old appliances free of charge have been expanded in recent years, even if some retailers only do so in combination with the purchase of another large appliance (like-for-like return).
*In contrast to this, manufacturers must provide commercial customers with a return option and dispose of the appliances free of charge. Transport may be billed.

For efficient recycling of old appliances, they must be returned in the correct manner. There are various ways for our customers to return their old appliances – no matter how and where they purchased them.

After we have taken the appliances back, we as the manufacturer ensure that they are recycled in an environmentally friendly way and that any materials left over are disposed of properly. While doing so, we comply with both legal and normative requirements. The latter are based on the European standard EN 50625-2-3 along with the associated specification (CLC/TS 50625-3-4). Our disposal partners had to implement them as soon as they were issued.

In Germany, the disposal of used appliances is not organised using public return systems, but by the manufacturers themselves. This is why the disposal companies are not only inspected by the state, but also by the domestic appliance manufacturers. Since 2007, we have a quality assurance system that checks the entire recycling process at our waste disposal service providers. Regular audits of the recycling plants ensure that these requirements are met. Infringements may result in penalties ranging up to cessation of delivery. In this way, we take responsibility as a manufacturer for our appliances and help protect the environment throughout their life cycle.

Getting ready: the fridge being prepared for an exhibition in Ochsenhausen.



In the acoustic test chamber: how well does the noise level compare to today's standards?

How durable a Liebherr refrigerator can be

One Sunday afternoon in autumn 2019 Liebherr employee Josef Niedermaier and his son went to a tractor fair at Lake Constance. A clear-out at an old farmhouse away from the main event attracted their attention. Among the items for sale, a very special item caught Josef Niedermaier's eye, for among all the clutter, buried under old crockery, was a Liebherr refrigerator. As an employee of the company, he knew that it was a very old one as soon as he opened the door, so he snapped it up for €20.

When he got it home, Josef Niedermaier brushed off all the old cobwebs gave it a good clean. The serial tag showed that it was a KT115/88 refrigerator. But would it still work? He plugged it in, and after a brief moment, the compressor began to hum steadily. When he opened the door, the light inside the fridge lit up, and he could hear the gentle sound of injection in the evaporator. The condenser also soon warmed up and the evaporator cooled down. The fridge was working perfectly.

Josef Niedermaier began trying to find exactly out how old it was. To do this, he contacted former Liebherr-Hausgeräte employees. The key clue came from a refrigerant expert, who discovered that the refrigerator was operated with F12 refrigerant. This was only used for a very short period in production in Ochsenhausen, Germany: namely in 1955. At almost 70 years old, this made it the oldest Liebherr refrigerator known to be in working order. Impressive proof of the traditionally high quality standards and outstanding longevity of Liebherr products!

–43 %

reduction of CO₂ emissions
from 2017 to 2021

–2 %

reduction of water consumption
from 2019 to 2021

–3 %

reduction of total energy consumption
from 2019 to 2021

Avoiding
unnecessary
plastic waste



Development and production sites

In order to make our production and operation as sustainable as possible, we continuously invest in our existing and new sites.



7.1 Environmental management

[102/11, 302/103, 307/103, 307-1] Environmental management is a key component of our Corporate Policy and is certified to ISO 14001 at all our sites. We strive to continually reduce the environmental impact of our products and production sites to a standard that goes beyond what is required by law. This is why we take sustainability into account through the entire life cycle of our products: from definition, development, production and use all the way to disposal. This is the only way to conserve valuable resources and improve energy efficiency and environmental performance. Liebherr aims to lastingly and significantly reduce energy consumption and greenhouse gas emissions, including during the manufacturing of our products. We have set ourselves ambitious goals in this area and have already achieved a lot. For example, we switched to climate-neutral green electricity at the Lienz site (Austria) as early as 2014 and at Ochsenhausen (Germany) in 2018. This enabled us to significantly reduce our CO₂ emissions.

The slight increase from 2019 to 2020 was caused by the electricity mix purchased at the Bulgarian site from the local energy supplier and could not be fully offset. CO₂ emissions vary according to the primary energy used. However, the aim is to make the energy supply of all European sites CO₂-neutral in Scopes 1 and 2 by 2030.

The required personnel for implementing the environmental protection measures have been established at the sites so that progress on the topics can be pushed forward by the local site and product environmental managers. The measures are coordinated globally via our environmental management-system. The catalogue of measures provides the necessary orientation and enables us to pursue the defined environmental goals. The basis for this is our management handbook and the fundamental environmental regulations of our management system. Our environmental protection measures are monitored and controlled using key environmental indicators, supplemented by specific databases as well as operating and process instructions. We also monitor the measures through continuous improvement processes and internal audits at the sites.

Our vertical integration, which is unusual in this sector, is a major advantage, allowing us to ensure environmental protection in much of our value chain by ourselves, as well as to implement measures quickly and effectively.

No failures to comply with environmental laws and regulations were reported or identified in the reporting period.

7.2 Involvement of our employees

[307/103] For successful environmental management, we need motivated and committed employees with whom we maintain an open dialogue to continuously improve our processes. We want them to contribute their ideas and stand up with conviction for more environmental protection. This begins with the onboarding process, which has a separate module dedicated to environmental and energy management. We also involve our employees through idea management, the continuous improvement process, and environment-related training. These are part of the occupational health and safety instruction. We also keep our employees up to date through regular communication in the departments and our regular environmental bulletins.

As an example of our involvement, the Liebherr environmental initiative Active Green Day is held each year at our Bulgarian site in Radinovo. The aim of this campaign is to support the city administration of Plovdiv in both actively protecting the environment and improving the quality of urban life. Due to the Covid 19 pandemic, the employees helped plant 62 trees and shrubs at the site as part of this initiative.

7.3 Energy consumption

[302/103, 302-1/4] In 2021 the total energy consumption was 73,938 MWh (2020: 72,618 MWh). The main energy sources are electricity and gas from the public grids, as well as liquefied gas.

In addition to protecting our environment, reducing energy consumption also improves our profitability. Through our professional energy management, we are continuously reducing energy consumption and have set ourselves the goal of further reducing CO₂ emissions. Since 2012, we have reduced total energy consumption by 9% – despite various expansion investments and changes to the scope of the balance by including data from the site in Kluang, Malaysia.

We have achieved these goals through numerous measures. For example, we have consistently invested: in renewable energies, in energy-efficient refurbishment of buildings and in energy-efficient plant technology. Waste heat from compressed air generation is used for low-temperature process heat and for room heating.

As part of the building renovation, we invested in lighting, cooling and temperature control. This has enabled us to sustainably increase our energy efficiency. Our lighting has now been almost completely converted to intelligently controlled LED technology. Technical optimisations have also further reduced the consumption of compressed air, thus saving energy.

After integrating the ISO 50001-certified energy management system at all our European sites, we are now focussing on more in-depth integration of processes. To do this, we break down our goals to the process owner level in order to enable specific successes in optimising energy efficiency in the departments, and also make them measurable.

Ochsenhausen site: In 2020 and 2021, we developed and implemented an integral concept for energy optimisation. This includes investments in renewable energies, such as for a 2 MW photovoltaic system, as well as new energy storage systems such as a compressed air energy storage. We were able to centralise our energy supply with a local heating network and thus make it significantly more efficient. We are already heating some of the buildings with climate-neutral local heating.

Lienz site: We have been using green electricity since 2014 and also using climate-friendly district heating to heat the administrative and social buildings. Gas consumption for the powder coating plant was also reduced considerably in 2020 by means of process engineering and organisational measures.

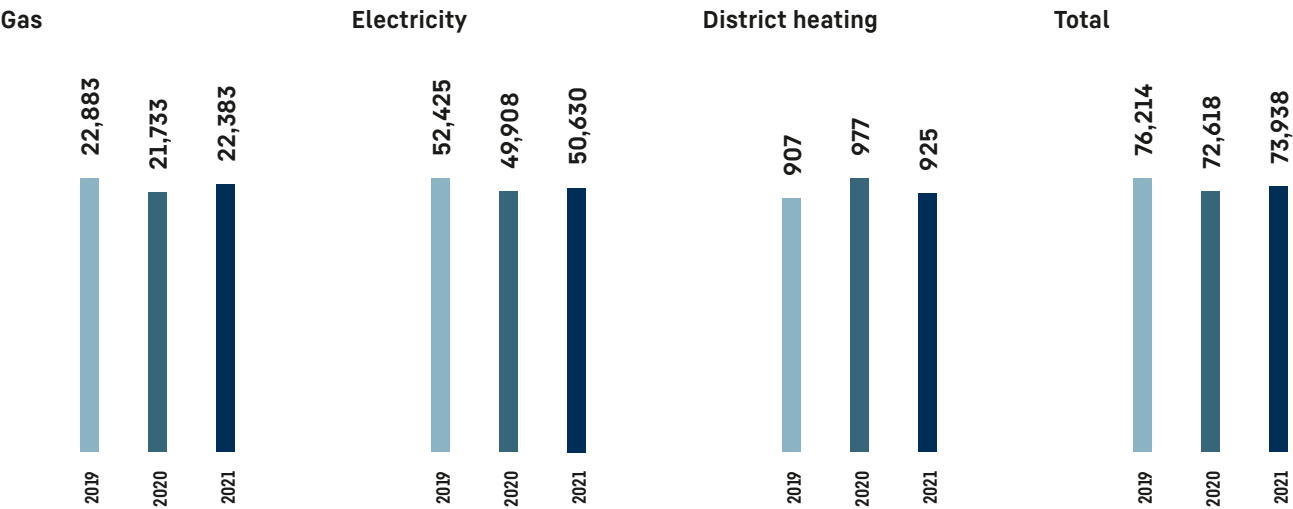
Radinovo site: We are also working hard to continuously and sustainably reduce energy consumption. For example, we have implemented special software to analyse consumption in detail. This helps employees prepare weekly energy consumption reports.

Kluang site: Key performance indicators for reducing energy consumption have been integrated, and these are regularly discussed and reviewed together with management. To raise awareness of the issue of environmental protection, employees are regularly trained according to the applicable laws and standards – for example through relevant work instructions or direct instruction.



The new 2-MW photovoltaic system in Ochsenhausen

Consumption of main energy sources in MWh

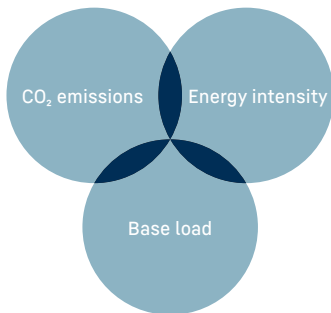


Our energy roadmap

Cross-site reporting for our energy cockpit enables us to monitor energy flows, identify potential savings and take action at short notice in the event of deviations. We are transferring this process to the individual departments at the plants, thus raising every employee's awareness of energy efficiency and energy savings. This is another important element on our way to sustainably reducing energy consumption and increasing energy efficiency.

Our energy roadmap is guided by the key figures for energy intensity (kWh/t), base load of the plants (kW) and CO₂ emissions (t CO₂), which, together with total energy consumption, we want to reduce through professional energy management at all our sites.

Energy management KPIs



7.4 CO₂ emissions

[305/103, 305-1/2/5, 102-48] To quantify the effects of our business activities on the climate, we look at direct and indirect CO₂ emissions (Scopes 1 and 2). We have used the insights thus gained to find sustainable and long-term methods for reducing our environmental impact.

As of 2021, we have reduced our CO₂ emissions by 43% compared to 2017, even though emissions from the Kluang site have been included since 2019. 2019 has been set as the new base year, because the boundaries of the analysis are wider than in the previous reporting period due to the integration of the Kluang site. The 17% increase from 2019 to 2021 is mainly explained by the specific CO₂ emissions from electricity supplied in Bulgaria. We continue to adhere to our long-term target for 2030 of climate neutrality in Scopes 1 and 2 at the European sites, and therefore intend to cut CO₂ emissions by more than half in the next few years. The use of green electricity in Lienz and Ochsenhausen and the efficient use of energy sources are key elements in succeeding.

Carbon footprint in t CO₂

	Scope 1	Scope 2	Total
2019	6,296	8,081	14,377
2020	5,757	10,533	16,290
2021	5,913	10,895	16,808

In terms to the Greenhouse Gas Protocol, Scope 1 are direct CO₂ emissions, such as from fossil fuels, and Scope 2 are indirect CO₂ emissions, such as from the consumption of electricity.

7.5 Solvent emissions

Our direct CO₂ emissions (Scope 1) are caused by gas and fuel consumed at our production sites. Indirect CO₂ emissions (Scope 2) primarily come from electricity consumption and local and district heating. We are committed to reducing our indirect CO₂ emissions through targeted measures. For example, the CO₂ emissions generated by parcels and mail from Lienz are offset by Österreichische Post (the Austrian postal service). In Germany, Deutsche Post has been shipping up to 125,000 spare parts and accessories parcels annually since 2015, also in 100% climate neutral fashion. In 2020, we were able to offset 52.77 t of CO₂ emissions at our Ochsenhausen site with climate-neutral GoGreen products and services. In 2021, the figure was 47.15 t.

The doors and side panels of our appliances are mainly powder-coated, small parts are coated with low-solvent paints, and pre-coated sheet metal is also used. For other applications concerning maintenance, we prefer to use water-based systems. In 2021, the solvents released by the painting and pretreatment processes at the four plants amounted to 16.2 t (2020: 13.7 t). Due to the integration of Kluang, the values were changed retrospectively compared to the CR Report from 2019. Despite the inclusion of the Malaysian site in 2019, total consumption decreased by almost 12% compared to 2012 (values from the 3 European sites only). In 2021, specific solvent emissions per appliance produced were 7.2 g (2020: 6.2 g).



Final assembly in Ochsenhausen

Trend in total solvent emissions

at the Ochsenhausen, Lienz, Radinovo and Kluang sites in t



7.6 Fresh water

[303/103, 303-1/3/5] We are reducing our water consumption in the long term through targeted water management. We have achieved many water savings since the 1990s, for example by changing the machine cooling system in the plastics areas, reducing the water required for paint preparation and by re-using the process water in powder coating plants. The withdrawal of water is approved and monitored by the state. None of our sites are located in an area where water is scarce.

We are determined to protect natural resources at our sites.

To obtain water in a way that conserves resources, water for cooling the manufacturing processes at the Lienz site has been pumped from a deep well and returned since 2013. This is done using a dual-circuit system with a heat exchanger and ensures that no contamination can enter the groundwater. The deep well also supplies water for the green spaces and for cooling the server rooms at the site. The use of the deep well will be further expanded over the next few years.

Well water is also pumped at the Radinovo site in addition to the public water supply. In 2021, water consumption at our four sites was 86,295 m³. Compared to 2019, this was a reduction of nearly 2%. In 2021, specific water consumption was 38.22 litres per appliance produced (in 2020: 35.88 litres).

7.7 Wastewater

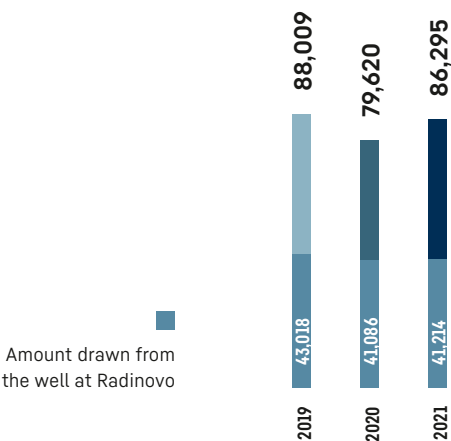
[303/103, 303-1/2/4] In the production areas, the process water required for cooling the machines and for coating is generally conveyed in closed circuits. Aqueous-alkaline degreasing processes are used to pretreat sheet metal parts. The wastewater is collected, treated and returned to the process. The residues are handed over to certified disposal companies once a year as part of a maintenance sequence.

At the Radinovo site, the wastewater is treated before it is discharged. No relevant quantities of directly process-contaminated wastewater are introduced to the public sewer system. Most of the wastewater comes from sanitary facilities and canteens, and is much the same as domestic wastewater. Exceptions to this include condensate from compressed air generation.

At all our sites, the discharge of wastewater is monitored in accordance with official regulations and the relevant standards. In 2021, the specific wastewater generation was 24 litres per appliance produced (2020: 21.54 litres).

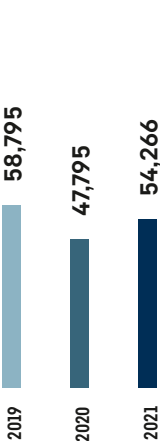
Trend in total water consumption

at the Ochsenhausen, Lienz, Radinovo and Kluang sites in m³



Wastewater discharged

at the Ochsenhausen, Lienz, Radinovo and Kluang sites in m³



7.8 Soil and biodiversity

[304/103] Together, the Ochsenhausen, Lienz, Radinovo and Kluang sites cover a total area of 812,500 m². 43% of this area is built over. The sites are all in industrial zones or commercial, mixed-use areas. As far as possible, open areas are designed to also serve as habitats for indigenous plants and animals. This was also taken into account as a key element in the design and planting of the vehicle park in Lienz. There are currently no measurably negative effects on endangered animal or plant species.

Soil and biodiversity measures are locally limited and therefore vary greatly from site to site. At our site in Ochsenhausen, we cooperate with the Kneipp association, providing company-owned land for a biodiversity project. During this cooperation with local organisations and farmers, we have created a large contiguous biotope in order to preserve biodiversity in species-rich flower meadows and counteract the decline of bees and insects.

An essential part of the project is the creation of between 8 and 10 hectares of flower meadows. These flower meadows are intended as stepping stones in a network of biotopes to preserve biodiversity. The large biomass retains water during heavy rains and helps prevent flooding in downstream areas. A biodiverse environment benefits the microclimate and has a positive impact on human health. In addition to providing a habitat for numerous animal and plant species, the increased leaf mass binds more CO₂ and particulate matter than conventional mulched areas.

7.9 Waste

[306/103, 306-2] We want to achieve consistent waste separation that begins exactly where that waste is produced. In recent years we have been able to consistently continue reducing the amount of waste produced at our sites. In 2021, the total quantity of waste from our four sites was 10,239 t (2020: 9,830 t). In 2021, the specific waste generated was 4.53 kg per appliance produced (in 2020: 4.43 kg). The recycling and reprocessing rate was almost 80 %. The types of waste include metals, plastics, packaging waste, paper, paint waste and reject parts, flat glass, household waste and canteen waste as well as building rubble.

Around 90 % of the plastics used are composed of the recyclable plastic polystyrene. As far as technically possible, the waste generated during the processing of plastics is collected, ground and mostly returned to the production process. Non-recyclable plastic waste is sold according to type. Hazardous waste such as phosphate sludge from pre-treatment in the powder coating plants is disposed of by certified companies. At the Lienz site, thanks to consistent re-use of water, this now only has to be done once a year.

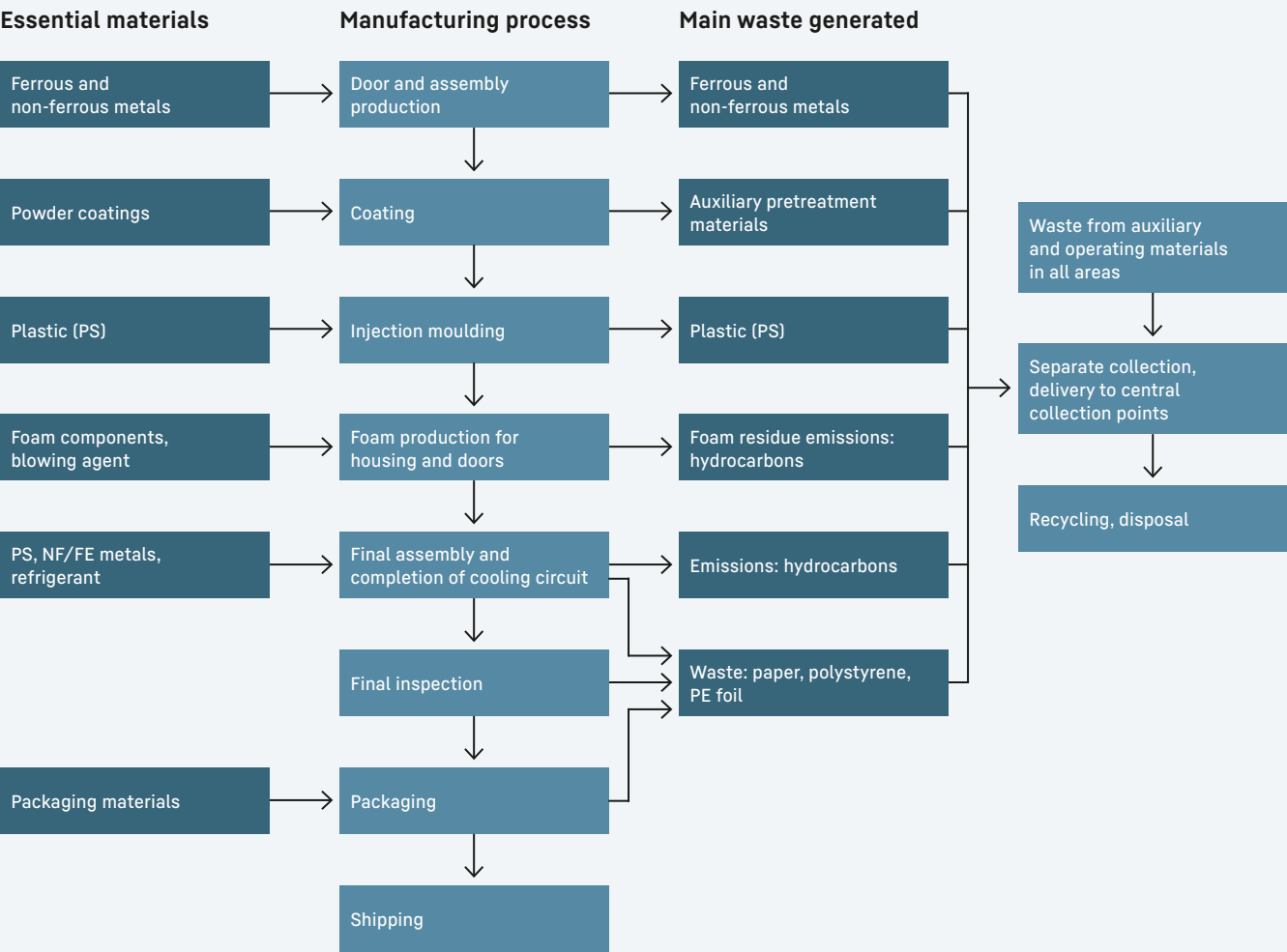
At the Radinovo site, the established system for waste separation means that 92 % of waste can be recycled, 7 % landfilled and 1 % re-used.

Trend in total waste generated

at the Ochsenhausen, Lienz, Radinovo and Kluang sites in t



Rough representation of production processes with the main material and waste streams



The polystyrene packaging that the compressors are delivered in is reprocessed externally so that some of it can be re-used for securing the finished appliances when they are shipped.

At the Ochsenhausen site, careful separation has reduced the amount of waste in the last two years. The recycling rate is currently just under 95%. Together with some of our suppliers, we are conducting analyses to reduce the packaging of various purchased parts. We are also using more and more reusable packaging which we return to the suppliers. We are not only reducing production waste, but also the amount of plastic waste in the everyday work of our employees. In Ochsenhausen, for example, waste is separated, and plastic cups have not been used for the hot drinks machines in the break rooms since October 2019. Instead, production staff now use reusable travel mugs.

At the company canteen in Ochsenhausen, we are also working on avoiding refuse and food waste. For example, we are increasingly using alternatives to plastic packaging for food. Our aim is to replace plastic with sustainable materials wherever possible. We also handle food, most of which is purchased locally, in a resource-saving manner. For example, we donate unsold baked goods to the local food bank, the St. Martin's shop.

In keeping with the philosophy of the Integrated Management System, there are also many different activities at the other European sites to promote acting locally and avoiding waste, especially unnecessary plastic waste.

EcoVadis silver status 2021

The Lienz site, which specialises in producing commercial appliances, was again assessed in the EcoVadis independent sustainability rating in the summer of 2021 and awarded the silver medal.

EcoVadis is an internationally recognised corporate social responsibility self-assessment. EcoVadis offers a solution for monitoring sustainability in global supply chains. Its methodology is based on international sustainability standards.

Silver status and the improvement of our overall rating by a further 5 points reflects the company's ongoing commitment to the environment, employment and human rights, ethics and sustainable procurement. The EcoVadis award is a further step towards integrating corporate responsibility and implementing policies that improve our environmental and social footprint. In the overall EcoVadis assessment of the general machinery manufacturing industry, Liebherr-Hausgeräte in Lienz is ranked among the top 6%, being one of the top 5% for environmental sustainability, the top 20% for sustainable procurement, and the top 25% for employment and human rights.



Chest production in Lienz



Constant
workforce

~100

Ideas as part of idea management

High-quality
training

with strong regional commitment

Fewer
accidents

thanks to good occupational safety



Employees

Our employees are the key to our shared success.
Our working relationship is based on the principles
of decency, mutual respect, fairness and trust.



8.1 Common values and guidelines

[102-8/16, 401/103, 401-1, 402/103, 403/103, 404/103, 406/103, 407/103, 408/103, 409/103, 412/103, 412-1/2]
Liebherr relies on highly motivated, skilled employees who have been loyal companions on our journey over the years and who are enthusiastically committed to Liebherr. In 2021 alone, out of more than 6,000 employees, 208 had anniversaries celebrating 10, 25, 35, 40 or 45 years of service. Many of our employees spend their entire working lives with the Liebherr Group and identify strongly with the company. They proudly call themselves “Liebherrians”. This great loyalty to the company has manifested itself for many years in a low staff turnover rate. While the national average staff turnover is currently around 30 %, at Liebherr-Hausgeräte sites in Germany it was only 6.6 % in 2021, and all the sites together 9.8 % (2020: 7.9 %). This is the result of values that we live by. We offer our employees a secure job and a healthy working environment, even in times of crisis.

Our employees take on full responsibility, performing their tasks within flat hierarchies that give them plenty of freedom to use their own initiative. We attach great importance to entrepreneurial thinking and action, and we support our employees with focussed training and education programmes. This enables them to develop in a variety of ways – personally and professionally. The Liebherr Group is a wholly-owned family business. This is what shapes our corporate culture and forms the solid foundation for our success. Our core values embody all the things that account for Liebherr’s present and future success. Our Guidelines for Successful Cooperation describe how we contribute to this success in the refrigeration and freezing product segment. These guidelines form a basis and provide us with orientation for cooperation and interaction. As part of our personnel development, they are an integral part of our management training and seminars. To further establish the guidelines in day-to-day work, we have incorporated them in the annual Employee Dialogue, where they provide a reference for mutual feedback.

8.2 Embracing diversity

[404-1, 405/103, 405-1] We are firmly convinced that embracing diversity has a positive effect on the entire organisation and society. Close cooperation across national borders enriches our company and encourages the international exchange of knowledge and experience between the European plants. By introducing a new organisation within the framework of an international matrix structure, we are promoting cooperation across locations. At the same time, we are strengthening our identity as a coherent product division – and making sure the synergy effects will continue to ensure our global success in the future.

We respect every individual as a person, are open to different views and allow for differences within the framework of our goals and values.

To support this cooperation, we launched the “Let me understand you” initiative in the form of live webinars, where employees gave each other insights into their culture and working environment. The aim of this measure was to further strengthen mutual understanding and the sense of unity. The events were recorded and are still available to all employees on the “Self-paced learning” portal.

The diversity of our product segment is also reflected in the fact that in 2021 we had a 25 % share of female employees (2020: 24 %). The proportion of managerial positions held by women at team leader level and above was 7.1 % (2020: 7.1 %). Our Corporate Policy aims to significantly increase the proportion of women in management positions in the coming years. However, we deliberately do not want to define a fixed quota of women, as we want to fill our management positions with the most suitable candidates – regardless of gender or other diversity criteria. In the process, we want to become more diverse and differentiated.

Key HR figures

for Ochsenhausen, Lienz, Radinovo and Kluang at a glance (on 31 December)

	2019	2020	2021
Permanent staff ¹	5,556	5,701	5,959
Trainees	100	91	94
Proportion of female employees	23.0 %	24.0 %	25.0 %
Proportion of employees in management positions ²	10.2 %	11.8 %	12.0 %
Proportion of management employees who are women ²	7.3 %	7.1 %	7.1 %
Employee turnover rate	7.3 %	7.9 %	9.8 %
Ø training hours	10.5	9.3	10.3
Notifiable work / commuting accidents	105	112	119

¹not including trainees, ²team leaders or higher

8.3 Co-determination and participation

[402-1, 407-1] Co-determination at the workplace has always been very important at our European sites. This means that the elected representatives of the workforce are involved in nearly all decisions. In accordance with the specified rights of co-determination and other forms of participation, our aim is to inform the employee bodies of changes at an early stage. In Ochsenhausen (Germany) and Lienz (Austria), elected works councils represent the interests of the employees. At our Bulgarian plant in Radinovo, elected staff representatives act on behalf of the employees. They meet with the management and the personnel department every two months to discuss proposals and solve potential items of conflict.

When different groups’ interests diverge, we strive to achieve solution-oriented results together with all those involved. There is close cooperation and a stable relationship of trust between the management, the personnel department and the works councils and employee representatives. The management provides comprehensive and timely information on all important operational changes during regular meetings. The main topics relate to the fundamental questions of the development of the company, investments, occupational safety and the concerns of the employees. If there are major changes, all employees are comprehensively informed at an early stage. New employees are informed about the possibilities of co-determination directly on joining our company.

8.4 Idea management

Our employees are part of the family business. Based on this premise, the management of the company gives them freedom for independent action and expresses trust in them. Everyone feels responsible for the success of the company and works towards it with passion and commitment. This attitude gives rise to numerous ideas and suggestions for improvement.

At Lienz (Austria) and Radinovo (Bulgaria), a continuous improvement process (CIP) has been established, in which employees develop proposals for improvements within their area of responsibility, either individually or in a group. At the Ochsenhausen site, a traditional employee suggestion scheme (ESS) in the form of idea management has been in place since 1995. The suggestions submitted mainly relate to the production and manufacturing processes. There is also a focus on topics related to sustainability.

Employees can also contribute their specific ideas for new products or product features for the development of appliances in the “Product ideas” area. This allows us to better utilise our employees’ potential for new and unusual approaches. A team of experts, consisting of at least one technical and one market-oriented expert, examines and evaluates the product ideas received. If the evaluation is positive, a committee decides whether the idea has the potential to become a development project. Among just over 100 suggestions received in 2021 (2020: 177), energy efficiency and sustainability played an increasingly important part.

8.5 Attractive and performance-related pay

[102-41, 201-3, 202/103, 202-1, 401-2, 405-2] The recognition of individual performance through an attractive remuneration package is based on collective agreements and voluntary company regulations. The amount of the pay depends on the task and the performance as well as on qualifications and experience. Neither gender nor orientation play any part in decisions on pay. We absolutely reject any form of discrimination.

Daily working hours are governed by the applicable statutory, collective bargaining and company provisions. With the exception of management employees, all employees in Ochsenhausen are subject to the collective agreement of Südwestmetall and all employees in Lienz are subject to the collective agreement of the electrical and electronics industry. The Bulgarian site at Radinovo has a remuneration scheme that is based on the local cost of living but is above the national average. At our site in Kluang (Malaysia) too, we place the utmost value on fair remuneration models. These are based on individual performance and on a standardised assessment process. In addition to the agreed basic salary according to the collective bargaining agreement, additional bonuses are paid to employees depending on their area of activity.

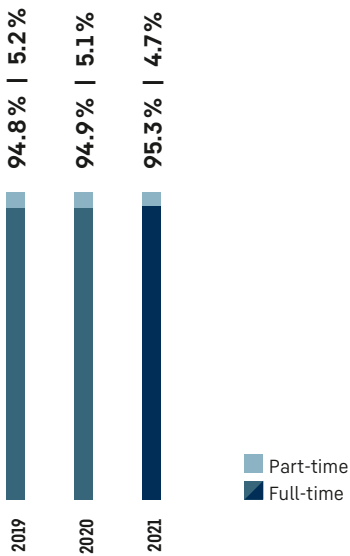
In many areas, the social and insurance benefits provided by the company are considerably higher than the statutory and collectively agreed levels. For example, we offer additional travel allowances, bus tickets, food subsidies, anniversary bonuses and loyalty bonuses scaled according to length of service, remuneration for inventions and improvements, additional Christmas bonuses, anniversary and retirement celebrations and additional paid leave. The company pays each employee's premiums for group accident insurance. Comparable employee benefits are also offered at the Kluang site in line with local standards. In Germany, employees who through no fault of their own have fallen on hard times can rely on financial aid from the Hans Liebherr-Hilfe e.V. benevolent fund. In addition, there is an employer-financed company pension scheme, which comes into effect after 10 years of employment. Employees can also provide for their own retirement through deferred compensation. Our older employees can enter a partial retirement agreement before they reach the statutory retirement age. All employees can take advantage of these social benefits, regardless of whether they work full-time or part-time.

We offer flexible working time models and fair remuneration.

The monthly remuneration remains stable even with seasonal sales fluctuations. We achieve this through flexible working time models and time account systems for the company and individuals. We only request temporary workers from service providers who pay their employees in accordance with a valid collective bargaining agreement.

Full-time and part-time employees

(in % on 31 December)



8.6 Work-life balance

[401-3] We want to offer our employees a good work-life balance – and at the same time meet production and sales requirements. This is why we have introduced various flexible working time models, full-time and part-time employment models, flexible shift models and part-time work for older employees in various forms at the European sites. The solutions are tailored to occupational requirements and the personal requirements of the individual. Mobile working enables our employees to better combine the demands of their professional and private lives – for example, when it comes to childcare or caring for close relatives.

With the long-term overtime account, our employees can further improve their personal work-life balance without neglecting operational concerns. Our effective working time management thus creates an ever better combination of company interests and employee interests – and this leads to greater satisfaction among our employees.

In 2021, a total of 106 employees at our European locations took advantage of the parental leave offer (2020: 94). All employees on parental leave are expressly encouraged to return to their jobs afterwards. Worldwide and across divisions, new mothers and fathers who work at Liebherr are given a gift to welcome their newborn baby.

The company ensures a balance between workload and the health of its employees.

We also provide special parking bays for mothers and single parents. This allows them to go home at short notice if necessary.

8.7 Training and study programmes

[404-2] One of the results of demographic change is the already noticeable shortage of skilled employees. In some areas, we face the challenge of our business developing more dynamically than the number of experienced employees available to us. Consequently, a major focus of our HR strategy is to attract talented and qualified employees and to develop them systematically.

We are countering the shortage of skilled workers with intensive training and development measures.

Through vocational training and study programmes, we are able to secure many of the young staff we need. In 2021 alone, we trained 95 young people in more than 20 technical and commercial apprenticeships and dual study programmes. The proportion of female trainees and students is currently 23.2%. The range of professions is continuously expanded as required: most recently with the dual courses Mechanical Engineering Mechatronics, Business Administration – Commerce, Refrigeration and Systems Engineering and Electrical Engineering.

Additional qualifications can be acquired on scientific certificate courses such as Smart Materials for a Greener Industry. At the Kluang site, students can gain a personal impression of Liebherr-Hausgeräte GmbH through internships lasting several months – this often helps to recruit new, qualified employees.

The key goal of the training courses is to teach occupational skills.

In our view, vocational training also means strengthening one's personal skills and abilities. It is crucial that our trainees and students acquire comprehensive occupational skills. In addition to technical and methodical skills, these also include personal and social skills. To deepen their skills, all trainees and students rotate through various specialist departments. This way, they not only expand their technical expertise but also their personal and social skills.



8.8 Our training philosophy

In addition to educational assistance for young people, there are accompanying events and seminars at all our training locations in Europe. Here, under the guidance of external and internal trainers, young people gain qualifications in many important areas. We also promote the young people's occupational skills on every level through intensive exchange between the specialist departments, courses in the apprentice workshops and in-house teaching.

Another pillar of training is intercultural competence,

which has become increasingly important in recent years. Intensive exchange between the sites makes it easy for Liebherr trainees and students to strengthen these skills. For example, they can visit the various sites and support the specialist departments, or they can take part in courses at the training workshops there.

The high quality of the training is regularly demonstrated by the exceptional final results achieved by trainees and the annual honours awarded by schools and professional associations.

We support young people at an early stage in their career orientation. To do this, we are in regular contact with students from all types of schools – and also with parents and teachers. Through joint projects and partnerships, educational theory combines with practice in the company. This enables young people to find their bearings and have fun learning. One example is the educational partnership between the Ochsenhausen site and the Reinstetten community school, where we jointly organise an “engineering competition” that aims to playfully encourage young people's enthusiasm for scientific topics. In addition, science classes from Reinstetten regularly visit our production facilities, where they are given tours of the plant with different focuses – for example, on plant safety.

We take our social responsibility seriously – by helping with career guidance.

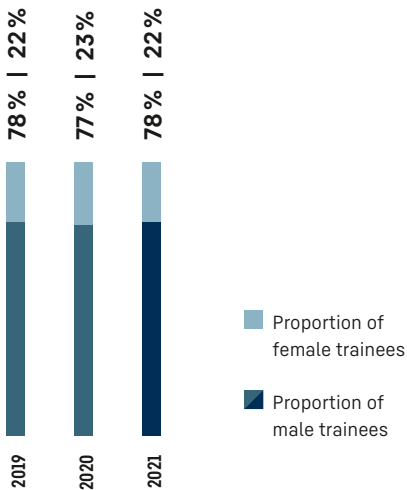
We also offer regular events at all our European sites, such as job application training and job discovery days, and we support local schools through presentations from training ambassadors at parents' evenings. Through internships for school and college students, young people can experience their chosen profession first hand.

We participate in the annual Girls' Day in Germany and Austria to increase the number of girls interested in technical occupations.

The second pillar of in-company training involves students from the cooperative state university of Baden-Württemberg (DHBW) in Ochsenhausen and graduates of the HTL (higher technical college) in Lienz. To help prospective students in their choice of career, Ochsenhausen participates in the SIA (Schüler-Ingenieure-Akademie - schools and engineering academy) project. In cooperation with various grammar schools and Biberach University of Applied Sciences, the young people spend a year implementing a technical project – for example, a solar air collector, the construction of a bridge, the manufacture of a water wheel or a biogas plant. With this project we have succeeded in inspiring the pupils. In recent years, we have successfully recruited students for our refrigeration and systems engineering as well as our electrical engineering courses.

Women and men in technical and commercial training

(in % on 31 December)



8.9 Personnel development

[404/103, 404-1/2] Our personnel development experts are passionate about preparing our employees for current and future challenges and creating a suitable framework for this. The human resources departments at our sites ensure this sustainable personnel development. In the process they are guided by the goals of our division. In particular, this means:

- Systematic further training and support for specialists and managers from within the company's own ranks
- Continuous development and expansion of international talent management
- Focussed qualification measures for specific target groups
- Standardisation of company-wide learning

Change and progress are our constant companions. Just as products and services develop, so does our way of learning. Until recently the focus was on passive and externally controlled learning, but now the employees themselves are the focus, taking responsibility for initiating and directing their own learning development.

Educational management as a sustainable approach to personnel development

Our cross-site initiative "Self-paced learning" is based on these guiding principles. The aim is to integrate learning as a fixed component of everyday working life. An important step here is the "Self-paced learning" initiative set up in 2021, which allows employees to choose interesting learning content on up-to-the-minute topics including fundamentals of communication, giving feedback, and developing an agile mindset. In order to promote technical, methodical social and managerial skills, in 2021 our employees took part in an average of 10.3 hours of internal courses (2020: 9.3 hours).

As a result, we were nominated and awarded a top-three place in the lifelong learning category of the 2021 German Demography Award. Lifelong and informal learning not only helps employees adapt to changes, but also actively shape them.





8.10 Annual employee dialogue

[404-2/3] The annual employee dialogue was harmonised at all European sites in 2020 in order to anchor the new matrix structure in the key management instruments and thus strengthen cooperation between sites.

The employee dialogue forms the basis for structured personnel development, qualification and succession planning. As a mutual and trusting dialogue, this regular meeting is intended to support the improvement of communication and cooperation within the company. It should be noted here that the focus is not on working through and filling in the form, but on the employee and their development. The form serves as an aid for a structured and consistent conversation.

In which ways does the employee dialogue help?

- It creates clarity about the strategy, goals and tasks
- It shows each individual's contribution to the big picture
- It forms the basis for trusting cooperation in an open dialogue based on partnership
- It serves as a steering instrument for management work
- It is the basis for ascertaining the employee's personal and professional development prospects

A good balance between standardisation and individual content has been created in the employee dialogue. For example, up-to-the-minute topics such as digitalisation, change management and intercultural cooperation are components of the so-called toolbox from which employees and managers can select topics that are relevant to them.

After the initial implementation, a survey of all employees and managers was conducted in mid-2020, in which 86 % of those surveyed stated that they were satisfied with the tool. Opportunities for optimisation derived from the responses to the survey were included for 2021.

To further strengthen collaboration, the team goal was implemented in the employee dialogue 2021. All team members are given a common goal that they work together to achieve. One of the reasons behind the team goal is to see beyond oneself and one's individual goals in order strengthen team spirit.

8.11 Leadership programme

The Covid-19 pandemic has had a lasting effect on the way we work. With a new hybrid, more flexible update to our proven leadership programmes, we are helping managers adapt learning habits to the “new normal”.

“Be a people enabler”: a key milestone for our new managers

A suitable mix of online and face-to-face formats offers the opportunity to deepen and reflect on what has been learned. Within the modules, topics such as leadership and personality, conflict management, feedback and teams are addressed. Another focus of the programme is on dialogue between different functions and locations.

A first successful pilot run with 28 participants from Lienz, Radinovo and Ochsenhausen took place in 2021. Other German- and English-language groups will be launched for new managers at HAU in 2022. The participants had the chance to be the first to accompany the programme and to actively contribute feedback for fine-tuning it before it goes into full operation.

In the course of 2022, we will offer our managers a comprehensive and varied range of courses on the topics of coaching tools, managing at a distance, introducing changes and agile leadership.

8.12 Mentoring programmes

The mentoring programme, which brings together mentors and mentees from different Liebherr organisations, has been successfully established at Liebherr's German sites since 2017. The focus is on the personal development of the participants and the expansion of the Liebherr network. Numerous preparations in 2021 made it possible to roll out the programme across Europe.

In future, it will be supplemented by a cross-sector mentoring programme. This programme will utilise the exchange of experience and support opportunities to see the bigger picture outside Liebherr.

8.13 Talent workshop

In 2021, the global concept for our “TalentWerkstatt” programme for young talent was developed for the European production sites. It promotes employees with exceptional commitment and potential. The focus is on further developing their interdisciplinary and personal skills as well as on preparing for future tasks and projects. In view of the increasing complexity and dynamics of the working world, a module on agile working and agile learning was included in the programme for the first time to strengthen our upcoming talent in dealing with uncertainty and complex problems. The global framework of the programme gives participants the opportunity to further expand their interdisciplinary and cross-site network and to harness synergies. The launch is planned for the third quarter of 2022.

8.14 Occupational health management

[403-6] We have laid the foundations for our occupational health management (OHM) with contact persons and committees drawn from multiple locations and countries to jointly elaborate fields of action. The pandemic affected occupational health management at all our sites, severely impairing occupational health measures requiring employees' presence. Digital offerings soon became a matter of course and have now become firmly established. Even so, events and offerings with physical presence will once again come more into focus. Both will find their place and target group at our company.

More situational than behavioural prevention in future

We are continuously developing our cross-site health management system. To ensure that all occupational health management measures are successful in the long term, a balanced interplay of behavioural and situational prevention is necessary. Behavioural prevention focuses on how people can do something for themselves and their own health. In contrast, situational prevention focuses on optimising processes and structures that promote health in the company and the workplace. By combining these two elements, we hope to achieve the greatest possible benefits for the health of our workforce.

To optimise situational prevention, we retrospectively evaluated measures already taken in Ochsenhausen in 2019 and implemented any remaining topics. A number of improvements were carried out at the workplaces and break areas. The survey once again made it clear that employees can co-operate with managers as a team to address and improve the everyday experience.

In Lienz, we also carried out the legally required evaluation of mental stress for the entire site in autumn 2020 as part of the situational prevention and optimisation. We analysed the results, then derived and developed possible measures in a number of workshops. These measures are now being implemented and regularly evaluated as part of our occupational health management. In this way, we want to reduce stress hot-spots in the company as a whole, but also in individual areas – and continuously improve the situation for our employees.

From the Ochsenhausen site we offer a support package that provides assistance and advice to employees with family members in need of care. People in such situations can get advice on how to cope with them, what support is available, how to find a place in a care home, and how to organise care at home. Those affected and interested can also book information lectures and courses. This support service is available to all employees of the German Liebherr companies.

At the end of the year, an OHM check was carried out on behalf of a cooperating health insurance company. The resulting report confirmed that the Ochsenhausen site has a health management system that uses the most modern and effective structures, processes and measures to make the best possible contribution to improving health. In the Workfit Company Awards, our health management system was therefore awarded gold status as “excellent”.

We have also been intensively committed for many years to ensuring a healthy working environment for our employees at the Lienz site. This commitment was rewarded in February 2020. Following its audit, the European Network for Workplace Health Promotion (ENWHP) for the second time awarded us the seal of quality for workplace health promotion, which is valid until 2022. Health management has also played an important part at the Radinovo site for many years. For example, employees regularly receive information leaflets on health-related topics. There is a wide range of offers to promote good health. These include psychological counselling, nutritional advice, a gym

pass, massages to strengthen back muscles, as well as various sports and fitness activities. An important element of the health management system is the additional health insurance, which allows employees to use medical services and facilities and pays for the costs that statutory health insurance does not cover.

Sustainable health promotion: 16 km for children's future

As host and initiator of the Business Run Plovdiv, Liebherr was pleased to invite motivated competitors to the starting line for a good cause in October 2021. Each team consisted of four runners, who each had to complete two two-kilometre laps. The background of the event was a social project in aid of the Bulgarian foundation “For our children”. For the past 29 years the foundation has been working to improve the well-being and quality of life of children and protect their rights. A team of experts from different social and medical professions provide a wide range of social services that promote children's development from an early age, thus minimising health risks.

Protecting health is also a high priority at Liebherr. Employees at the Kluang site are supported by the HR department and works council in protecting their personal health. For their personal well-being, employees are offered an annual medical check-up. In addition, permanent staff are protected by company and social insurance.

Age distribution of permanent staff

(in % on 31 December)



8.15 Occupational safety

[403/103, 403-1/2/3/4/5/6/7/8/9] Our occupational health and safety is organised on the basis of the ISO 45001 standard. It is controlled using our Integrated Management System (IMS), which ensures a continuous improvement process. All our occupational health and safety systems are based on the relevant national occupational safety laws. Our Integrated Management System is supplemented with annual audits, analyses of incidents and accidents, as well as organisational and technical measures to ensure health and safety at work. In accordance with occupational health and safety law, working committees meet several times a year at all sites. These consist of members of the management board and representatives from the areas of occupational safety, occupational medicine, HR and the works council. Since 2020, all daily production meetings have also included occupational health and safety.

We identify potential hazards, both physical and mental.

In accordance with national requirements, we carry out regular evaluations of the individual workplaces to assess the potential risks for the employees working there. This integral approach also includes an assessment of the psychological stress factors associated with daily work. The results are directly integrated into the occupational health management system.

To implement a continuous improvement process and minimise the risk of accidents, our sites are equipped with software that is managed by the environment, health and safety department. All occupational accidents and incidents where medical assistance is required are registered in this system. An assessment using defined criteria is carried out together with those responsible. We record the measures derived from this in a catalogue and continuously monitor their implementation and effectiveness. Reports to the accident insurance company (employers' liability insurance association) are also processed and ensured using this system.

We provide a safe and healthy working environment for all employees.

All our employees are provided with personal protective equipment in accordance with the risk assessment. For all workplaces and activities that are considered relevant according to the risk assessment, the necessary documents and training certificates are available: for example, operating instructions, brochures and other materials relating to occupational safety and environmental protection. Regular measurements of the working environment help to make workplaces safer. This applies in particular to noise, dust, lighting, chemical hazards, microclimate and electromagnetic radiation.

In 2021, our European sites underwent a risk assessment by Zurich Insurance Risk Engineering as part of the property insurance programme. This assessment included facilities, activities and processes, as well as dependencies on key suppliers and other production sites within the group. The overall assessment for the risk of property damage was "very good" for the Radinovo site and "good" for Ochsenhausen and Lienz. For the risk of interruption to business, Ochsenhausen and Lienz were rated "very good" and Radinovo was rated "good".

At the sites, company doctors, certified nurses, paramedics and trained first-aiders ensure that employees receive the appropriate medical care. They advise on all aspects of occupational health and safety as well as on the prevention of work-related illnesses. They also provide primary medical care in the event of accidents and acute illnesses. More than 500 trained first-aiders can assist in the initial care of injured employees. The European sites are also equipped with defibrillators.

At the various sites, the teams are assisted by recognised plant fire brigades, firefighting teams or a fire SWAT team. All these units work closely together with the official national fire brigades. Employees are trained annually on how to use fire extinguishers.

There are a total of 13 specialist occupational safety officers. In addition, more than 50 employees act as voluntary safety officers alongside their main occupation. In 2021 there were 86 notifiable accidents at work. To reduce this number in future, an accident dialogue has been established. This allows a better analysis of accident problem areas. The number of days lost due to occupational accidents in 2021 was reduced to 1,742 calendar days (2020: 2,220). All employees are insured in the event of an occupational accident. In accordance with legal regulations, all internal and external employees take regular safety training courses. At the same time, we train them on the basics of ergonomic work design and environment-related topics.

The management system for occupational health and safety covers all employees, external companies and visitors.

Courses on occupational health and safety are defined in a training plan. All occupational safety training and instruction is conducted during working hours, with topics based on job requirements and qualifications.



Practising for an emergency: our plant fire brigade in Lienz

78 %
of the purchasing volume in Europe

580
suppliers of manufacturing materials

85.2 %
of the highest-volume suppliers have
an environmental management system

Efficient use of cargo spaces:
95 %
of lorries travel with loads of 100 %



Supply chain and logistics

We believe a trusting relationship with our business partners is the foundation for long-term cooperation.



9.1 Relationship to suppliers

[102-9/10/16, 204/103, 204-1, 308/103, 308-1/2, 408/103, 408-1, 409/103, 409-1, 412/103, 412-1/2, 413-2, 414/103, 414-1/2] A core value of our group of companies is that we are a trustworthy partner. We want stability and reliability that will last for years. This core value plays a key part in shaping the relationship with our suppliers and is the starting point for long-term cooperation.

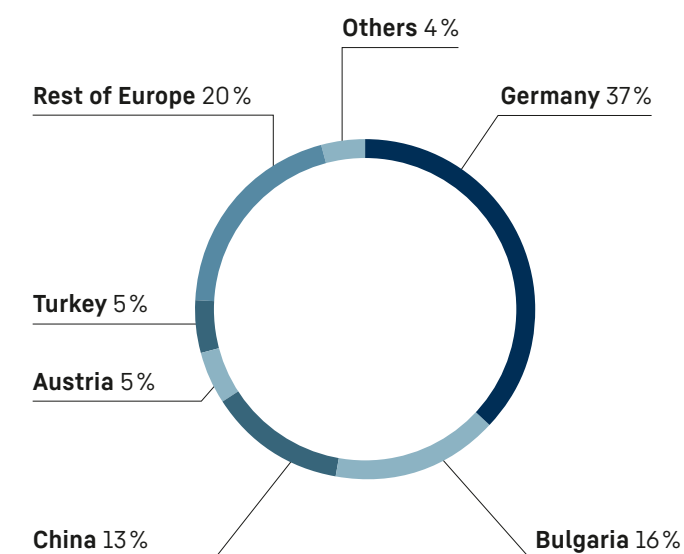
To ensure that this is also reflected in our day-to-day business, we have also committed ourselves to sustainable practices with regard to our suppliers and business partners. We have set down our principles for trusting cooperation in our [Liebherr Group Code of Conduct](#) and the [Compliance Guidelines](#) (and from 2022 onward also in the [Code of Conduct for Suppliers](#)). The Code of Conduct sets the standards for integrity and proper business conduct. We also pay attention to compliance with social standards when choosing our suppliers. We observe human rights, and we prohibit forced or child labour as well as discrimination and unequal treatment. All supplier companies must undertake to protect employees and confirm in writing that they comply with the applicable laws, guidelines and regulations, and must also provide the necessary evidence.

The environmental and food-related requirements for components and raw materials are defined by the applicable laws and internal guidelines, such as the procedural instruction on environmentally compatible procurement. Our contracts with suppliers also take environmental aspects into account: for example substance bans, food and drinking water conformity, REACH and RoHS conformity, and regulations on wood and packaging.

Managers and employees take part in compliance training courses to raise awareness. These are also part of a comprehensive online training package that is mandatory for certain groups of people upon being hired.

Proportion of purchased volume of manufacturing material

in the main countries and regions in 2021



In the area of production materials, we worked with a total of 580 suppliers in 2021 (2020: 570). Our suppliers range from global corporations to medium-sized and small companies. We also include social workshops.

For example, the Ochsenhausen site in Germany has been supporting the St. Elisabeth foundation (Heggbacher workshops) for over 20 years by purchasing various pre-assembled modules. Waste disposal is also handled by the workshops.

Proportion of the 75% highest-volume suppliers with an environmental management system



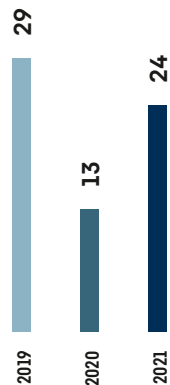
9.2 Compliance with environmental and social standards

[102-9/16, 204/103, 204-1, 308/103, 308-1/2, 408-1, 409-1, 412-1, 414-1/2] Our purchasing departments at the sites are of course also aware of their responsibility with regard to [ecological and social aspects](#). We demand high quality and economy from our suppliers. We attach particular importance to a trusting, long-term supplier relationship and to building up new, sustainable partnerships. The aspects of quality, costs and security of supply play an important part in the selection process. This enables our purchasing departments to use it for operational decisions and preventive measures.

We source 78% of our procured material from partners in the countries where our European production sites are located.

Our goal was for more than 70% of our top 75% of suppliers in terms of turnover to have an environmental management system by 2020. We have more than met this target, with 78.24% in 2020 and 85.2% in 2021.

Number of supplier audits carried out (quality and environment)



We regularly conduct supplier audits to check whether the supplier is capable of delivering and complies with the quality standards. The scope and number of supplier audits are defined annually by our purchasing and quality management departments, and are fixed in an audit programme. We also take into account the risk potential of the countries concerned. If there is reason to believe that our quality standards are being violated, an escalation process begins, which can lead to the de-listing of the supplier. Gross violations lead to immediate termination – for example, in the case of forced or child labour. In other cases, we check whether the supplier concerned is still acceptable and can continue working for us. This depends on an assessment of the supplier's capacity to improve. The supplier must be willing to solve the problems actively and transparently. To do this, they draw up an action plan together with our specialist departments.

In this reporting period, we did not have to de-list any supplier due to violations of internal or legal requirements.

The increasing globalisation of procurement markets poses new challenges for our supplier management. In order to secure the supply of materials, we will continue internationalising our procurement activities as part of our purchasing strategy and will further intensify dual sourcing.





9.3 Logistics

We value energy efficiency not only in our products but also in their transportation.

[413-2] The geographically central location of our production sites allows us to optimally and efficiently coordinate the distribution routes to our important sales regions in Western and Eastern Europe. In what we call our home markets, our sales companies supply our trading partners using contracted freight companies, while in other markets our importers are responsible for transport.

Short distances and full loads
reduce emissions

The Global Supply Chain Logistics department coordinates all distribution logistics centrally. On average, 9,500 appliances from all sites are shipped each day to around 90 countries. We are continuously striving to improve the efficiency of the entire transport process for finished appliances.

The most important measures are:

- Central warehouses at the factory sites and five strategically located regional warehouses. This way, we aim to serve our core markets reliably and efficiently.
- Efficient use of cargo space by precisely planned shipments with optimally loaded vehicles. To avoid unnecessary emissions, around 95% of lorries now leave the central warehouses 100% loaded.
- Constant optimisation of the transport system and avoiding empty trips. The flow of material between the plants takes place via regular factory transports. For example, a lorry comes from Bulgaria with finished appliances for the German market and then is loaded with reusable packaging and pallets from the production areas for the return journey.
- Multi-modal logistics concepts, which optimally combine the various modes of transport: road, rail and sea. We use rail transport whenever possible, for example to supply customers in Austria. Lienz has a direct rail connection, and the sites in Ochsenhausen and Radinovo (Bulgaria) have special stations for directly loading railway wagons.

In recent years, we have invested in efficient logistics centres. For example, the new logistics centre in Ochsenhausen has enabled us to save almost 8,000 lorry journeys a year between the external warehouses since 2009. This was supplemented in 2016 by the new logistics centre in Radinovo. It is located directly by the motorway that connects the capital Sofia to the coastal city of Burgas on the Black Sea. The logistics centre has 12 lorry loading ramps and two railway wagon loading stations with hydraulic loading ramps. The appliances produced are transported via a conveyor tunnel from the production hall to the finished goods warehouse, where they are prepared for further transport and dispatch. Numerous sustainability aspects were also taken into account during construction: for example, minimising heat loss. For this, the Radinovo logistics centre received the Building of the Year award in the Production and Logistics Buildings category from the Bulgarian Ministry of Regional Development and Public Works in 2016.

In logistics, the future challenges lie primarily in ever smaller consignment sizes and the associated longer transport intervals. Here we are faced with conflicting objectives. We want to meet customer demands for smaller, faster deliveries – but at the same time reducing emissions and environmental impact. This is why we work with specialised logistics service companies that group our shipments appropriately with those of other manufacturers.

The same applies to our overseas markets. We want to make transports more efficient in future and reduce their environmental impact. An integral approach to the supply chain is also becoming increasingly important. Digitalisation, processing and evaluation of logistics-related data are becoming increasingly significant too. This is why we have established a global supply chain management system and are also developing an integral logistics controlling and key performance indicator system. Our goal is to achieve the defined level of delivery service – with optimised costs and high distribution quality. Here, for example, we want to reduce damage during storage and transit. We also want to further optimise warehousing and are currently developing strategies for automating warehouse processes or eliminating them altogether. In our warehouses and plants, we now almost exclusively use electrically powered forklifts.

We are also continuously optimising the travel of our employees and reducing the number of business trips. We do this primarily by increasingly using video and telephone conferences. At our plants, we are promoting electromobility and equipping them with charging stations. An electric car has been added to the pool of vehicles at Ochsenhausen for local and regional journeys.

Travel between the plants is optimally combined and we reduce individual trips by means of carpools. At Lienz, an optimal foundation for carpooling was laid with the purchase of a minibus.

We support our employees in using local public transport: For example, we work with regional providers to coordinate our shift times with their departure times. In addition, we offer our employees separate parking facilities for carpools as well as covered and monitored parking for bicycles and motorised two-wheelers. In this way, we create low-threshold incentives for more environmentally conscious behaviour.

Getting through the Covid-19 pandemic with responsibility and team spirit

Since the start of 2020, the Covid-19 pandemic has been part of every-day work in our organisation and therefore part of our lives. From the very beginning of the pandemic, Liebherr-Hausgeräte has responded to the new requirements with a great sense of responsibility and consistency throughout.

Through comprehensive measures and transparent communication, we succeeded in getting our company and, above all, our employees safely through the acute phase of the pandemic.

And in the endemic phase that is now likely to begin, we will continue to do everything in our power to meet our responsibility for the health of our employees and their families.



10.1 Comprehensive health and hygiene measures

During the past two years, the health of our employees has naturally been paramount. This is why we designed and implemented numerous preventive measures and other work processes specifically for this situation. These include:

- Comprehensive hygiene and distancing management, resulting in a new field of expertise called “Hygienic Site”
- Postponement of business visits and business trips
- Strict rules for visitors to protect our employees
- Great flexibility for working from home

many employees were faced with completely new challenges. For example, they had to deal with the ergonomics of their workplace when working from home. The new situation meant that employees were increasingly in digital contact and it was possible to provide targeted webinars and online training units, for example. Solutions for the new work situation at home could be communicated using simple and cost-effective tips.

In addition, the company’s health management team provided special advice for everyone in the workforce on how to deal with the challenging situation.

To further increase safety for our team, in December 2020 we began setting up our own testing centres at each production site, where employees could be tested regularly and without fuss.

When vaccines became available in 2021, we offered them to all employees at our European sites. This meant they could get vaccinated during working hours – flexibly and without long waiting times. This way, we actively contributed to increasing the vaccination rate at Liebherr and throughout Europe.

With the preventive measures implemented in connection with the Covid-19 pandemic, the Radinovo site achieved second place in Bulgaria’s annual national occupational health and safety awards in 2020 in the category for companies with over 250 employees. The prevention practices were coordinated in advance with Liebherr’s European sites.

10.2 Doing good things in bad times

Particularly in times of crisis, it is important that companies live up to their responsibility toward people – their employees as well as society as a whole. For Liebherr, it was therefore only natural to supply both our workforce and local charitable organisations with protective face masks free of charge.

At our site in Lienz (Austria), we had the opportunity put our core expertise to good use. In November 2020, we supplied Lienz district hospital with a special ultra-low temperature freezer for drugs and laboratories free of charge, with a temperature range from –40 to –86 °C. It has space for up to 25,000 doses of Covid-19 vaccine.

10.3 Communication promotes safety

Communication is an important aspect of successful Covid management. This is why – and also because it is part of our corporate identity anyway – we have kept our employees regularly and clearly informed about all the developments and measures. To ensure comprehensive and modern communication, we have introduced an employee app specifically for this purpose. We can use it to quickly inform our employees at all sites about current developments. Of course, we also prepared important Covid-related information such as hygiene instructions, face mask sewing tips and working time regulations, and communicated it via the app.

At all our sites, we have worked closely with the local authorities to even better fulfil our responsibility to look after our employees and their families.

Facts and figures

Key figures

Refrigeration and freezing product segment

	2019	2020	2021
Sales performance in €m			
Total	983	1,007	1,051
Worldwide sales performance in millions of appliances			
Total	2.240	2.292	2.266
Investments in €m			
Total	51	38	59
Development of the entire workforce worldwide			
Total	6,190	6,298	6,618

Products

Percentage distribution of appliances according to the EU energy labelling law (by number of appliances)

	2019	2020	2021
A+++ and own A+++ label –20 %	27 %	25 %	
A++	61 %	63 %	
A+	10 %	10 %	
A and below (B, C, D)	3 %	2 %	

Percentage distribution of appliances according to the EU energy labelling law as of 1 March 2021 (by number of appliances)

A	0.1 %
B	0.3 %
C	1.8 %
D	18.5 %
E	31.3 %
F	44.7 %
G	3.3 %

Development and production sites

Trend in total energy consumption at the Ochsenhausen, Lienz, Radinovo and Kluang sites in MWh

	2019	2020	2021
Total	76,214	72,618	73,938

Consumption of main energy sources in MWh

Gas	22,883	21,733	22,383
Electricity	52,425	49,908	50,630
District heating	907	977	925

Carbon footprint in t CO₂

Total	14,377	16,290	16,808
Scope 1	6,296	5,757	5,913
Scope 2	8,081	10,533	10,895

Trend in total solvent emissions at the Ochsenhausen, Lienz, Radinovo and Kluang sites in t

Total	13.2	13.7	16.2
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Trend in total water consumption at the Ochsenhausen, Lienz, Radinovo and Kluang sites in m³

Total	88,009	79,620	86,295
Amount drawn from the well at Radinovo	43,018	41,086	41,214

Wastewater discharged at the Ochsenhausen, Lienz, Radinovo and Kluang sites in m³

Total	58,795	47,795	54,266
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Trend in total waste generated at the Ochsenhausen, Lienz, Radinovo and Kluang sites in t

Total	11,411	9,830	10,239
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Employees

Key HR figures for Ochsenhausen, Lienz, Radinovo and Kluang (on 31 December)			
	2019	2020	2021
Permanent staff	5,556	5,701	5,959
Trainees	100	91	94
Proportion of female employees	23.0%	24.0%	25.0%
Proportion of employees in management positions	10.2%	11.8%	12.0%
Proportion of management employees who are women	7.3%	7.1%	7.1%
Employee turnover rate	7.3%	7.9%	9.8%
Ø training hours	10.5	9.3	10.3
Notifiable work / commuting accidents	105	112	119

Suggestions submitted as part of the traditional idea management system (ESS) at Ochsenhausen (on 31 December)			
Total	255	177	97

Full-time and part-time employees in % (on 31 December)			
Part-time	5.2%	5.1%	4.7%
Full-time	94.8%	94.9%	95.3%

Women and men in technical and commercial training in % (on 31 December)			
Proportion of female trainees	22%	23%	22%
Proportion of male trainees	78%	77%	78%

Age distribution of permanent staff in % (on 31 December)			
Age			
≤ 29	17.3%	16.4%	16.7%
30 – 50	51.7%	51.6%	51.6%
≥ 51	31%	32%	31.7%

Supply chain

Proportion of the 75 % highest-volume suppliers with an environmental management system in %			
	2019	2020	2021
Total	76.8%	78.24%	85,2%

Number of supplier audits carried out (quality and environment)			
Total	29	13	24

Objectives

Our Corporate Responsibility Management will be continuously expanded over the next two years with the following measures.

Corporate Responsibility Management

Focus	Measure	Period
Dialogue with stakeholders	Ongoing dialogue with stakeholders in line with the new requirements of ISO 9001, ISO 14001 and ISO 50001	Continuous
	Proactive fulfilment of important requirements of our stakeholders and expected legal requirements	Continuous
Corporate Responsibility communication	Extending the scope of reporting on sustainability	2022/2023
	Extending external and internal communication on corporate responsibility	2022/2023
Awareness of sustainability	Optimising knowledge transfer between sites and departments regarding the refrigeration and freezing product segment corporate responsibility activities	Continuous
Integrated Management System	Recertification of the individual management systems including optimisation of monitoring and reporting	Continuous
Data protection	IT security training for new employees and annual update on current topics for relevant groups	2022/2023
	Implementing the extended regular basic training on the European General Data Protection Regulation (GDPR) for relevant groups	2022/2023
Sustainable Development Goals (SDGs)	Highlighting our contribution to achieving the Sustainable Development Goals (SDGs) of the United Nations	2022/2023

Sites

Focus	Measure	Period
Energy	Continuously reducing energy consumption at all sites and incorporating the results when planning new systems and processes	Continuous
	Further increasing use of the deep well at the Lienz site	Continuous
Emissions	Continuously reducing the CO ₂ emissions of the refrigeration and freezing product segment.	Continuous
	Climate neutrality at European sites (in Scopes 1 & 2)	2030
	Comprehensively recording and calculating all emission and consumption data relevant to sustainable reporting	2022/2023
Water	Identifying further potential for saving water in systems, processes and areas not specific to production	Continuous
Waste	Continuing and constantly improving the waste KPI cockpit and increasing the proportion of waste that can be recycled	Continuous

Employees

Focus	Measure	Period
Value-based corporate culture	Intensifying use of the Guidelines for Successful Cooperation at all locations	Continuous
Training and education	Demand-oriented expansion of training places and dual study courses at the locations	Continuous
	Encouraging female trainees in technical professions	Continuous
Recruiting young staff and ensuring qualification	Talent promotion programme for highly motivated employees with the aim of strengthening and developing their own skills	2022/2023
	Making managers aware of specific effects of demographic change as part of strategic personnel planning	Continuous
Diversity	Raising awareness of diversity and expanding measures to promote it	Continuous
Occupational health management	Continuously strengthening occupational health management (with a focus not only on physical but also mental health) using digital tools	Continuous
Safety at work	Regularly updating work safety training in a digital form and providing it to employees at all European sites	Continuous
	Progressively reducing the accident and illness rate	Continuous
Hygienic site	Forward planning and early initiation of further preparatory health protection measures regarding the local Covid-19 situation, as well as prompt and direct communication of required measures to employees	Continuous

Product

Focus	Measure	Period
Energy efficiency	Progressively reducing the energy consumption of our products in the European market	Continuous
Resource efficiency	Continuing with and actively supporting the Circular by Design research project and implementing the findings	2022/2023
	Finding ways to complete material cycles and initiating improvements to the product range in terms of design for recycling	2022/2023
	Continuing to take existing requirements into account while developing the products as far as possible and improving them in terms of resource efficiency, durability, ease of repair and recyclability	Continuous
Materials	Comparative analysis of existing materials and potential alternatives in terms of environmental compatibility, taking into account current and future end-of-life scenarios.	Continuous
	Investigations into increasing the proportion of recycled material used (especially post-consumer)	Continuous
	Step-by-step implementation of sustainable packaging materials/ components	2022/2023
	Not using HFOs as long as their environmental effects are not fully understood	Continuous
	Extending checks of the origin of materials classified as critical, in particular conflict minerals	Continuous
Pollutant-free products	Continuing to develop and manufacture products in compliance with the applicable regulations, in particular REACh, RoHS and food compliance	Continuous
Networks and digitalisation	Implementing a digital dashboard for customer-oriented support on network-connected devices	2022/2023
	Further establishing customer centricity to take the wishes and needs of customers even more strongly into account	Continuous
	Developing a service app to help service technicians make accurate and efficient diagnosis for repairs	2022/2023

Supply chain and logistics

Focus	Measure	Period
High environmental and social standards	Compliance with recognised environmental and social standards in the supply chain (inspections and possible expansion of the existing supplier selection and auditing processes)	Continuous
	Reducing emissions in logistics while also meeting our customers' requirements for flexibility	Continuous

GRI index

[102-55/56] The Liebherr-Hausgeräte GmbH Corporate Responsibility Report 2021 is based on the standards of the Global Reporting Initiative (GRI). In our opinion, this report fullfills the “Core” option of the GRI Guidelines. There has been no external verification by an independent third-party. In addition to the core requirements, further indicators are included in the report. Information on fulfilment of the indicators can be found on the relevant pages of the report, which are linked to here.

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Imprint

[102-53] We look forward to receiving your questions, suggestions or criticism regarding our Corporate Responsibility Report and our sustainability activities. Further publications and information about our company and our products are also available on the internet at home.liebherr.com.

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