

Annual Report 2015



LIEBHERR

Annual Report 2015

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Introductory Remarks by the Family Shareholders

The 2015 Business Year

Dear Readers,

Last year's turnover of 9.2 billion Euros was the highest in the history of our family-owned company, with increases in almost all our divisions. This is due first and foremost to the immense efforts of our employees, who now number more than 41,000. We take this opportunity of expressing our thanks to all of them, and also to our customers and business associates for the trust they placed in us.

There was progress in many areas in 2015: we strengthened our production facilities and our worldwide sales and service network, and pressed ahead with a number of major building projects. We also invested considerable sums in research and development, with significant success. We investigated many new technologies and extended and optimised our portfolio across all product areas. This annual report describes examples of our innovative activities and the people who undertook them, for instance the new LR 1100 crawler crane, which incorporates many technological innovations.

Our work on tomorrow's technologies is confirmed in particular here by portraits of a number of development teams. From the exceptionally powerful dockside material handling machine to the "smart refrigerator" or the air-cycle air conditioning system for rail vehicles – our innovative capabilities are greatly enhanced by close cooperation between members of staff from different product areas and departments, an approach that greatly enriches our work.

Joining others on tasks with intrinsic fascination: this principle holds true when we think outside the box and cooperate with other highly competent companies. A clear example is the joint venture between Rolls-Royce and our aerospace division: long-term cooperation on the development of new power gearboxes puts us among the companies that influence the future of aviation.



The family shareholders active in the Group (from left to right): Patricia Ruef, Stéfanie Wohlfarth, Jan Liebherr, Sophie Albrecht, Isolde Liebherr and Willi Liebherr

Our aim is to be a consistently trustworthy business partner for our customers. Liebherr's service-area staff all over the world work with exceptional determination to uphold this claim. We describe several such unusual customer support activities in this report.

The Liebherr Group supplies what is probably a unique variety of products and services, including several hotels, some with a long tradition. Back in the late 1950s Hans Liebherr built a guest-house in southwest Ireland to accommodate visitors to his new factory there. It was developed soon after into a full-scale hotel. Today the Group operates six hotels, in Ireland, Austria and Germany. We invest continually in them so we can offer guests the highest quality standards.

Top quality is indeed our objective in all our divisions, and this year is no exception to the rule. We will continue to invest in new technologies, but also in our network of production facilities and our sales and service organisation. At the end of the 2016 business year we expect our turnover to be approximately the same as in the previous year. The workforce is expected to increase slightly. We are confident that 2016 will be another good year for the Liebherr Group.

Dr. h.c. Dipl.-Kfm. Isolde Liebherr

Dr. h.c. Dipl.-Ing. (ETH) Willi Liebherr

Presiding Committee of the administrative board of Liebherr-International AG

Brief Portrait of the Group

Brief Portrait

The Liebherr Group

Hans Liebherr established the company that bears his name in 1949. Since then it has grown into a group of more than 130 companies on all continents, employing 41,545 people at the latest count.

Today, Liebherr is not only among the world's largest manufacturers of construction machinery, but is an acknowledged supplier of technically advanced, user-oriented products and services in many other fields of activity as well. The Group's holding company Liebherr-International AG, which is based in Bulle, Switzerland, is wholly owned by members of the Liebherr family. The Liebherr Group's corporate culture has been determined from its earliest days by its family ownership. For more than 60 years, Liebherr has demonstrated what this means in terms of stability and trustworthiness, and has striven for a close long-term relationship with its customers and business associates.

Liebherr shapes technological progress and aims to retain its position at the leading edge of future technology. All its activities have top quality as their central element. This principle is upheld by all the Group's employees in their day-to-day work. Liebherr's products are the outcome of its passion and dedication: tailor-made solutions that take the customer's needs and wishes as their starting point.

41,545
employees

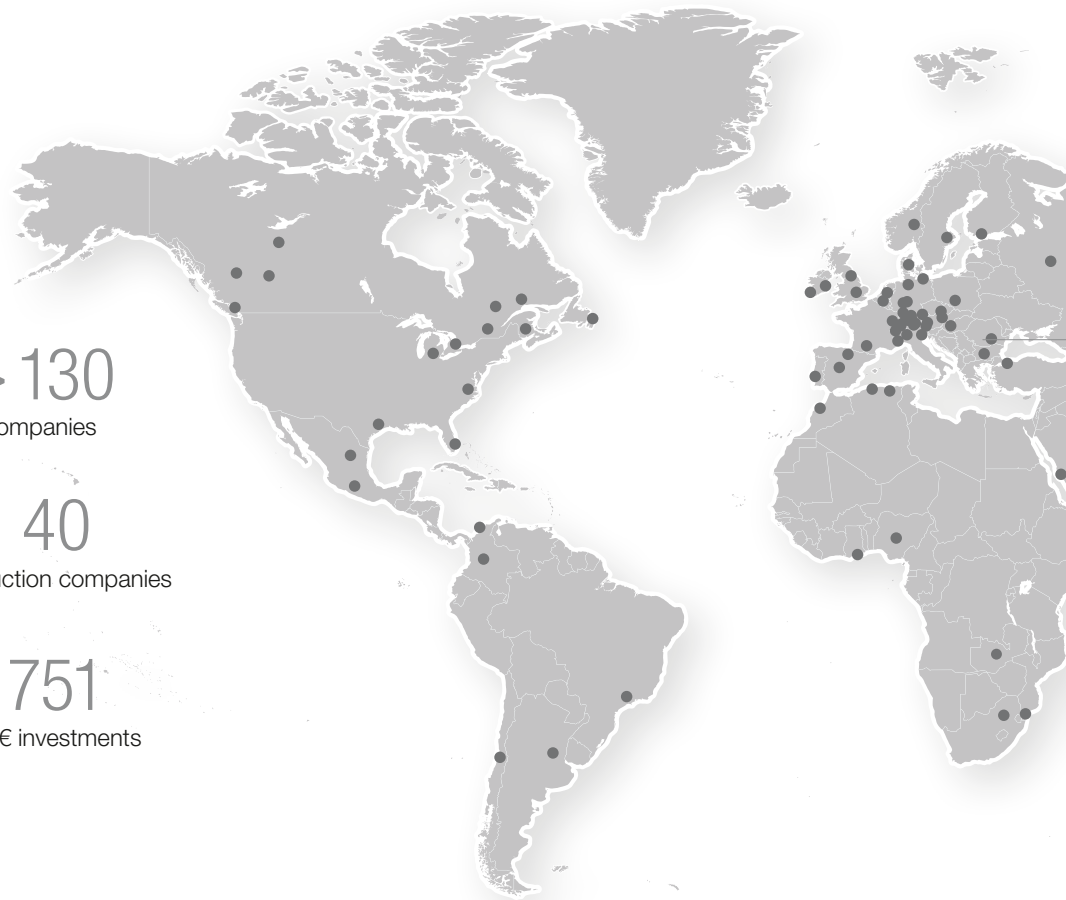
> 130
companies

11
divisions

40
production companies

9,237
m € turnover

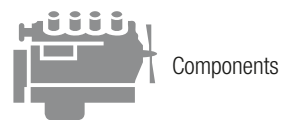
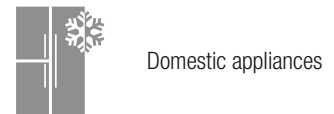
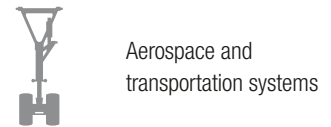
751
m € investments



Principal locations of Liebherr companies



The Group's Divisions



Self-conception

The Liebherr Group is wholly owned by members of the Liebherr family, and this situation is not about to change. The Group and the family are inseparable. Value-oriented corporate culture ensures close links among the employees, and inspires confidence among customers and business associates.

Hans Liebherr established the original company, and his ideas and untiring personal effort were the elements that led to its successful growth and sound structural basis. Liebherr has demonstrated its stability and trustworthiness for more than 60 years, and these vital factors derive from the personal efforts of its proprietors and the corporate character

of a family-owned business enterprise, the independence of which gives Liebherr ample freedom in all its actions and the decisions it takes. The shareholders in the family-owned group are Hans Liebherr's children and grandchildren, who play an active part in the management of various Group divisions. They uphold his tradition and ensure security and continuity.

The family, as the Group shareholders, is conscious of its business responsibility and pursues a clear, well-structured path that points the way toward sound ongoing development. Job security for the workforce and consistent integrity in business activity are elements of major importance in corporate management.

Liebherr-International AG: Company data

Head-office	CH-1630 Bulle/FR
Share capital	CHF 100,000,000
Shareholders	Liebherr family (100%)
Administrative board	Dr. h.c. Willi Liebherr, Chairman Dr. h.c. Isolde Liebherr, Vice-Chairman Hubert Liebherr Sophie Albrecht Jan Liebherr Patricia Ruef Stéphanie Wohlfarth
Managing directors	Andreas Boehm Stefan Heissler Uwe Rechtsteiner Denis Zosso
Auditors	Ernst & Young AG, Berne

From generation to generation

Liebherr is thus an independent family-owned business enterprise that is now managed jointly by members of the second and third generations. This continuity is a characteristic of the Group and a firm foundation for its success.

The highest level of decision-taking and management within the Group is a committee of partners made up entirely of members of the Liebherr family. All fundamental questions of corporate procedure and development, product, financial and investment policy come before this body.

In addition to Dr. h.c. Willi Liebherr and his sister Dr. h.c. Isolde Liebherr, members of this policy-making body are Jan Liebherr, Stéfanie Wohlfarth, Sophie Albrecht and Patricia Ruef, all representing the third Liebherr family generation. The active part played by the children and grandchildren of company founder Dr.-Ing. E.h. Hans Liebherr guarantees management continuity and will ensure that the Group remains insolubly linked with the Liebherr family in the future.

The family shareholders active in the Liebherr Group



Dr. h.c. Willi Liebherr
Chairman of the administrative
board of Liebherr-International AG



Dr. h.c. Isolde Liebherr
Vice-Chairman of the administrative
board of Liebherr-International AG



Jan Liebherr
Member of the administrative
board of Liebherr-International AG



Stéfanie Wohlfarth
Member of the administrative
board of Liebherr-International AG



Sophie Albrecht
Member of the administrative
board of Liebherr-International AG



Patricia Ruef
Member of the administrative
board of Liebherr-International AG

The Group's business model

User value

For more than 60 years Liebherr, as an independent family-owned group of companies, has stood for a high standard of user-oriented products and services in many technical areas. The Group offers customers all over the world, and in many different business sectors, access to leading-edge, innovative technologies with all the benefits of tailor-made solutions and genuine user benefits in the product and service areas.

Products and customer segments

For the construction and commodity extraction industries all over the world, the Liebherr Group builds and sells tower cranes, mobile and crawler cranes, hydraulic excavators, material handling machines, duty-cycle crawler cranes, wheel loaders, crawler tractors and loaders, pipelayers, telescopic-boom loaders, dumper trucks, concrete mixing plant, concrete pumps and truck mixers. In addition Liebherr develops, builds and maintains worldwide ship, pontoon, offshore, container and mobile harbour cranes designed to handle cargoes of the most varied nature. In the plant and machinery area its activities include machine tools, automation systems and engineering projects. For the aerospace industry it supplies undercarriages, flight control, actuating and air management systems. Its transportation systems business area produces equipment for rail vehicles. Liebherr's large, varied range of domestic and commercial refrigerators and freezers provides high levels of user benefit. In the components area, the Group specialises in the design, development and manufacture of technical products for mechanical, hydraulic and electric driveline and control systems. Last but not least, the Group operates six hotels in Ireland, Austria and Germany.

Distribution channels

Products and services are supplied by way of a widespread network of Group-owned sales and service companies, and also through reputable partners with which Liebherr has enjoyed many years of loyal cooperation.

Customer relations

Liebherr aims to build up and maintain close cooperation with its customers and business associates over a period of years or decades. Its aim is to respond quickly, flexibly and reliably to their needs and satisfy them by supplying top-quality technologies. This close relationship with customers and the high value that Liebherr attaches to user benefit are keys to the Liebherr Group's success and a firm element in its corporate tradition as a family-owned business.

Key activities

The Liebherr Group develops, produces and sells innovative, user-oriented products and services.

Key resources/added value chain and key partnerships

Liebherr invests unceasingly in research and development, and can therefore call upon considerable powers of innovation. To develop its capabilities, the Group undertakes partnerships with universities of applied science and similar institutions all over the world. Liebherr's international activities are backed by the skills and qualifications of more than 41,000 employees.

A network of more than 40 ultramodern production plants in 17 countries and many years of cooperation with suppliers within and outside the Liebherr Group have put it in a position to offer innovative products of impressive quality at competitive prices. Well-planned parts supply logistics and high standards of after-sales service are the final decisive links in the Liebherr business model.

Liebherr dedicates itself to mastery of key technologies down to the smallest detail, and can therefore claim a high degree of independence in technological areas.

Thanks to a high equity ratio, Liebherr is in a position to grow organically and rely on its internal strength.

Earnings and cost structure

Liebherr generates its earnings from product sales and rentals and from the supply of services.

Certain divisions within the Liebherr Group profit from economies of scale as their production volume rises. Others are more closely focused on the development of tailor-made solutions for individual customers. In such cases Liebherr concentrates on the creation of additional premium value for its customers and supplies services with a high degree of specific client relevance. The Liebherr Group benefits from synergies that derive from its broad product portfolio, its mastery of key technologies and other factors. In many cases the supply chain is global in character.

With its eleven divisions the Group pursues a policy of diversification that makes it independent of economic fluctuations in individual business sectors or markets. The profits

earned by the Group are re-invested internally with the aim of achieving long-term success in line with its management perspective.

Organisational structure

The Group's holding company is Liebherr-International AG, with its registered office in Bulle, Switzerland. The corporate structure ensures a unified approach to questions of central importance and permits a rapid response to market requirements at divisional level. The Group's decentralised structure offers a number of advantages. Besides customer proximity, the ability to adapt quickly to changes is made possible, since a minimum of hierarchical levels encourages the implementation of new ideas with no loss of time. Divisional management companies are responsible for overall operative management in the various product areas.



Service job at a crawler tractor

Magazine

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2015 – The Business Year

Highlights

In the past year Liebherr's product divisions and companies at home and abroad were active in many different areas.



January

Two awards at the 2015 "Intermat"

The new LiUP crane driver elevator system is awarded Gold at the "Intermat" construction machines exhibition in Paris, France. The Liebherr Demolition Control System (LDC) safety feature for demolition excavators is awarded Silver. Liebherr is the only manufacturer to claim two Innovation Awards.

February

Maiden flight of the Bombardier CS300

The Bombardier CS300 successfully completes its maiden flight. This is the largest model in the Bombardier C Series aircraft family. Liebherr equips the aircraft with the landing gear system and the integrated air management system.



© Bombardier



April

New parts depot in operation

The new global logistics centre at Kirchdorf an der Iller, Germany, supplies customers all around the world with spare parts for earthmoving machines. It has an area of 47,000 m² – as large as six football pitches. The hall features an automatic high-level racking system with 60,000 pallet spaces.



May

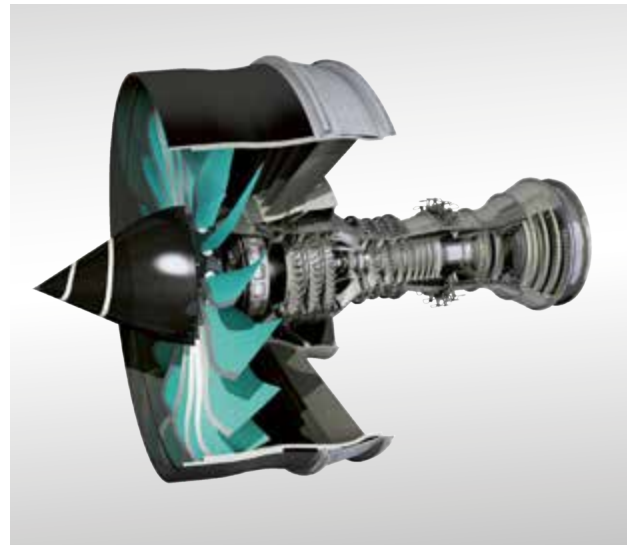
Successful trials of pre-series R 9200 mining excavator

The pre-series of the new R 9200 mining excavator has been operated successfully at different locations and in various applications including a coal mine in Indonesia and an iron mine in South Africa. This new 200-tonne excavator is equipped with a 12.5 m³ bucket to suit mining trucks in the 100-tonnes class.

June

Joint venture with Rolls-Royce

Liebherr-Aerospace and Rolls-Royce founded the 50:50 joint venture Aerospace Transmission Technologies GmbH based at Friedrichshafen, Germany. The joint venture will make available the production technologies for the components of the power transmission gear train of the UltraFan™ engine. The new engine design should be ready for operation from 2025. A single gearbox will be able to transmit the power of over 500 family cars. The joint venture's general managers are Heike Liebe and Dr. Rob Harvey.



June

New LR 1500 crawler crane

The new LR 1500 crawler crane is presented at Customer Days in Ehingen, Germany. The crawler crane makes load capacities in the 500-tonne category possible with dimensions and component weights that previously have only been possible in the 400-tonne class. Its engine output of 350 kW is even in the range of engines for 600-tonners.



August

150 EC-B flat-top crane is highest point in Germany

A 150 EC-B flat-top crane works on the Zugspitze, building the new Eibsee cable car. The crane was erected with the help of a helicopter. At 2,975 m, it is (for the time being) the highest point in Germany.

September

World's largest mobile harbour crane delivered

Liebherr supplies the first LHM 800 mobile harbour crane to the multipurpose Sea Cargo Complex Bronka near St. Petersburg, Russia. With a lifting capacity of 308 tonnes and 64 m outreach, the gigantic mobile harbour crane can handle up to 22 container rows. It is the largest mobile harbour crane currently available on the market.



September

Premiere of the "BluPerformance" domestic appliance series

At the "IFA" in Berlin, Germany, Liebherr presents numerous innovations from the domestic appliances division, including the new BluPerformance equipment line. Refrigeration and freezing units are characterised above all by the new energy efficiency class A+++/-20% and by the precise touch electronics.



October

New XPower generation of large wheel loaders

Liebherr presents its new generation of XPower large wheel loaders. The wheel loaders feature a power-split drivetrain, which combines hydrostatic and mechanical drive. The wheel loaders satisfy the Stage IV/Tier 4f emission standards and are particularly reliable and safe in their operation thanks to their powerful components.



October

European Table Tennis Championships in Yekaterinburg

At the European Table Tennis Championships in Yekaterinburg, Russia, Liebherr is not only the headline sponsor for the event, but also sponsor of the German and Austrian national teams. The teams win a total of four gold medals as well as one silver and one bronze medal.



December

Ground-breaking ceremony in Ettlingen

Liebherr starts the construction of a 2,500 m² factory hall at its plant in Ettlingen, Germany. This will allow the centre for remanufacturing drive components – which is located there – to be expanded. Liebherr expects demand to increase for overhauling customer components for construction machines, mining equipment, mobile cranes and maritime cranes.



Interview

“Technological Variety Is Our Strength”

*Questions to Dr. h.c. Isolde Liebherr, Vice-Chairman of the administrative board of
Liebherr-International AG, and Dr. h.c. Willi Liebherr, Chairman of the
administrative board of Liebherr-International AG.*





In 2015 the Group's turnover was more than 9.2 billion Euros. What is your verdict on the past business year?

Willi Liebherr: All in all, we can be very satisfied with last year's results. Turnover was higher than in any previous year in the company's history, despite the fact that the global economy lost impetus compared to 2014. We were especially pleased that there was growth in almost all our divisions.

Which were the growth markets?

Isolde Liebherr: We achieved satisfactory growth rates in Western Europe, America and the Far East/Australia in particular, and there was notably positive progress in Germany, the USA and Great Britain, in other words in well-established industrial countries.

How did business progress in emerging markets such as Brazil, Russia or China?

Isolde Liebherr: Although the business climate in China cooled down, we were able to achieve a positive result. We too have felt the effects of the downturn in Brazil and Russia. We have been active on the Brazilian market for more than 40 years, and have experienced several market fluctuations there. As soon as the level of business takes an upturn, we shall be ready and waiting. There is already promising development in Brazil's wind power sector, with a definite increase in demand.

What is the situation in Russia?

Willi Liebherr: Political tension between Russia and the West has markedly varied effects for us. Our total exports to Russia dropped further in 2015, though some product areas developed positively. At the same time, increasing pressure to use local content stimulated business activity at our factory in Nizhny Novgorod. We manufacture products for the domestic market there, but also supply locally made parts to our own factories in Western Europe. For us, Russia is traditionally a very important market and will remain so. For this reason we hope that a more relaxed political situation will prevail before long.

You mentioned that Liebherr's business volume in China has grown. How does this accord with current weaknesses in China's economic activity?

Willi Liebherr: China is gradually developing into a more mature macro-economy. This is in our interest too, since a well-developed market calls for products of high potential quality containing increasingly advanced technologies.



Our broad-based product portfolio enabled us to expand in China last year. In specific terms we position ourselves as a partner for clients in Chinese key industries such as aviation or automotives, who may be interested in our machine tools and automation equipment. We also see continued potential in China in the construction machinery and mining area, and for maritime cranes.

Isolde Liebherr, which milestones did you consider especially significant in 2015?

Isolde Liebherr: The International Consumer Electronics Fair in Berlin was certainly one of them. We had a totally new family of "BluPerformance" refrigerators and freezers on display there. They are environmentally acceptable and highly efficient in their use of energy.

Another highlight for me was delivery of our first Type LHM 800 mobile harbour crane to St. Petersburg. It is currently the largest mobile harbour crane in the world.

Further milestones were the 30th anniversary of the Inter-alpen-Hotel Tyrol and the event held to celebrate the 100th birthday of Hans Liebherr, our father. We met many of his contemporaries at this event, which was very impressive and emotional. Since the company's first product was a tower crane, it is a most gratifying coincidence that last year we secured the largest-ever individual order in the history of this product area.

“We can only assess a situation properly if we’re close enough to it”

And for you, Willi Liebherr?

Willi Liebherr: Last year we formed Aerospace Transmission Technologies GmbH, a joint venture with Rolls-Royce. It will supply the production technology for power gearbox components to be used in Rolls-Royce’s new UltraFan™ engine. This is another addition to our performance potential in the aviation area, and renewed evidence of our technological competence, since we were able to adapt existing in-house technology for the new application. If we were not in possession of the relevant gearbox know-how, Rolls-Royce would certainly not have considered us as a technology partner.

Another major landmark I would choose to mention again is our first large order from Boeing. For the 777X wide-bodied aircraft we will be supplying the wingtip folding system, the drive unit and hydraulic motor for the wing leading-edge actuating system and all the actuators for the high-lift divide system. This is a major success for us.

Yet another important milestone reached last year was a cooperation agreement with the Claas company. In accordance with its requirements, we will be developing and building a telescopic-boom loader for use in agriculture. The machines will be built at our factory in Telfs, with series production due to start within two years. Also high on my list was a major order in the wind power area, placed at the end of the year by Enercon. The volume of this order demonstrates yet again that our customers value reliable suppliers capable of delivering top quality consistently for many years.

Isolde Liebherr: And that is precisely where we are immensely strong.

Willi Liebherr: Correct – which reminds me to say a word or two here about our mining area. Although the extraction industries are currently in a difficult situation, there were nonetheless several welcome developments in this product area. We celebrated 20 years of mining truck manufacturing in Newport News, USA. We also delivered our hundredth Type T 282 C truck – a giant vehicle with a service weight of up to 600 tonnes – to Australia. Last but not least, the PR 776 crawler tractor for mining and extraction work was an important new product, the world’s largest crawler tractor with hydrostatic transmission. Although the market is still weak, we haven’t altered our targets; in fact we have optimised our extensive product range and enlarged it still further. For us, this had top priority.

Turnover was higher, but earnings went down again. Does this worry you?

Isolde Liebherr: Not in the least! We know precisely where we need to take action. We have three large divisions that are currently not achieving satisfactory results, though they are already back on the right path. Furthermore, our investments and depreciation are permanently at a very high level, which has an effect on results. Nevertheless, we have no intention of reducing what we regard as investments in our future. We shall continue to strengthen our Group systematically. Exchange-rate fluctuations also exert a considerable influence on results: this can be positive in one year, negative in the next. The operative result was better than in the previous year; the drop in earnings is entirely due to the financial result. All in all, we regard the future with equanimity.

What was your investment focus?

Willi Liebherr: We have invested considerable sums in all our divisions. One of our objectives is to optimise logistics processes at various locations. Components were another priority. We reorganised this division in recent years with the aim of strengthening its ability to compete. This has involved extensive investment, for example in Biberach, Bulle and Deggendorf.





“We know how important freedom of action is for our staff”

Which technologies did the Liebherr Group mainly work on in the past year?

Isolde Liebherr: Despite the enormous diversity of our product programme, the main topics are often very similar, for example using energy more efficiently and reducing the weight of our products. Other important areas are digitising, networking and automation, and also making the machines and systems solutions we supply easier to service.

Can you give us an example?

Isolde Liebherr: Certainly! Let's take the term “digitising” as it's applied to the planning and monitoring of our customers' construction sites. As systems provider, our task is to network the individual construction processes by means of suitable IT tools, and support the work undertaken by everybody concerned wherever this can bring practical benefits. It's already possible for construction companies to survey a site automatically. We in turn can use this survey data for our planning tools and on this basis recommend the ideal machine for the specific task. We can also offer our custom-

ers an opportunity to test the chosen machine in conditions close to reality – in a simulator that resembles the ones the airlines use. We can go even further, with systems that combine the correct positions of the construction machines and the process data. We then have the answer to questions such as where the machine is standing and precisely where the next operations have to be performed.

So you're looking at the construction site of the future...

Willi Liebherr: Yes we are, but of course digitising and integration of our machines on networked construction sites are only one part of the picture. We also aim to extend our existing know-how to new applications. This can for example mean using aviation technologies in space travel, for the automobile industry or on rail vehicles. In response to a commission from the German Environment Agency, we are currently working on a project for the sustainable air conditioning of public transport vehicles. It makes use of technology from our aerospace business area.

This is one of our true strengths: the wide variety of technologies we have mastered and our skill in adapting them for use in other applications. But technological competence is not everything: the decisive factor is the complete package we offer our customers. My sister has emphasised our determination to maximise the efficient use of energy, and to make our products easier to maintain. A high-quality product is not an end in itself; we must back it up with customer support throughout its operating life. This starts by offering prospective customers an advisory service, supplying an economical machine and reliable after-sales support and in due course reconditioning certain components and selling the machine second-hand at the highest possible value.

Our aim, in other words, is to offer greater value for money in every phase of the product's life and support the customer reliably with practical suggestions and recommendations. You could call it Liebherr's "all-round carefree package". We work hard on this matter not only in the construction machinery sector but in all the Group's divisions.

In a recent opinion poll you were both chosen as being amongst Germany's most popular company executives. The Liebherr Group has also been praised in several employer surveys. What does this mean to you?

Isolde Liebherr: We're naturally pleased to be chosen for distinctions like these, but they're not the focal point of what we do. We concentrate instead on the quality of our work. For us, the company and its employees are the most important factors, and if we and they succeed together, then we're on the right track.

Are there any internal family rules that all the active shareholders are expected to comply with?

Willi Liebherr: Our company has been growing for more than 60 years, and in that time certain rules have emerged for the executive members of the family. For example, it's very important for the emphasis to be on the company as a whole, not on individuals. We have to keep a clear head so that we can devote ourselves to business activities. One of our principles is that you have to get close to a situation in order to assess it properly. This calls for all the family partners to be prepared to accept a high degree of responsibility.

What value is attached to personal responsibility in the Group's corporate culture?

Isolde Liebherr: The employee's personal responsibility is one of our management guidelines. Our task is to create appropriate general conditions for this purpose. Personal responsibility is much more motivating than any set of rules. People often say how impressed they are by the amount of freedom of action we give our staff. We're convinced that this policy is a key to our success. At the moment we are working on widely different strategic human resources and employer branding projects. What many young people expect of an employer has changed a lot, and we are taking this into account.

This year Liebherr is celebrating 66 years of vocational training; what value does the company attach to training?

Willi Liebherr: We have always considered initial and follow-up training to be important. The current tendency is to complain about the shortage of skilled employees, which goes to show how essential a high-quality training programme is for every company. We offer young people an extremely broad range of initial or follow-up career training in technical and commercial trades. We also provide various opportunities for dual-system study.

Last but not least: will you risk a forecast for the current year?

Isolde Liebherr: We expect our total turnover to be at the previous year's level. We shall continue to expand our worldwide activities and invest considerable sums again in our production facilities and our sales and service network. And we won't depart from our principles: we will remain a trustworthy partner in the customer support area – one that puts its technological know-how at the customer's disposal.

Isolde Liebherr and Willi Liebherr – thank you for this interview.

Focus on Development Teams

“Innovative – That’s Us!”

Shaping technological progress in many areas is one of the Liebherr Group's principal objectives, and a passion shared by all employees. From the initial idea to the finished product, the aim is to concentrate know-how from business sectors that may differ widely. Developing something new is always the outcome of teamwork.



On the new LH 110: team members for the material handling Port product line

“Our tradition pledges us to innovation”

Since the 1960s Liebherr has developed and built material handling machines in various sizes and equipped for a variety of tasks. Bernd Wager, Product Line Manager for dockside material handling machines at Liebherr-Hydraulikbagger GmbH in Kirchdorf an der Iller, Germany, sums up the initial situation: “About four years ago we began to sketch out a development concept for an entirely new model: the LH 80 was considered small and the next model higher up the scale too large. Obviously what we needed was a machine to fill the gap between the existing models.”

The solution of the development team at the Liebherr factory in Kirchdorf: the LH 110, a machine rated to move loads weighing up to about 10 tonnes at working radii of more than 20 m. Sarah Wetzel, who was in charge of project development, says: “In our planning we put the emphasis on versatility.” As a result the LH 110 is not only available in an industrial scrap-metal handling version but also to “Port” specification for dockside load movements.



The LH 110 working at the dockside

The new model underwent a systematic development process conventionally used in the earthmoving division; this determines and accompanies product development as a series of phases. Various teams from Sales, Product Management, Development, Purchasing, Manufacturing and After-sales Service work simultaneously on their contributions to the project. Sarah Wetzel: “Each team has its own priority task, so that every aspect of development is taken into account.” At this specialised level, the exchange of know-how with other Liebherr Group companies is especially important. High quality standards are achieved by using in-house sources, for example the diesel engine and the hydraulic cylinders, pumps and motors, but also large diameter bearings and transmissions from companies within the components division. As a company based on tradition, Liebherr knows the value of consistent, well-proven methods, but as Bernd Wager points out: “Part of that tradition is our ability to come up with innovative products and ideas. Research and development has very high status in the Liebherr Group.”

In the early stages of development, only a small team worked on the new model, but this later grew to about 50 – all with different backgrounds. There were team members who had been with Liebherr for 20 years or more, and others who had joined the Group only a few months previously. “And cooperation between colleagues from various departments makes the whole project much more effective”, Sarah Wetzel is convinced.

In the technical office, the engineers faced a challenge specific to the Port version of their new LH 110: increasing load capacity and working radius, and at the same time optimising the weight of various mechanical components.

Bernd Wager explains what this involves: “At the dockside the machines aren’t worked as intensively as in industry. Reducing the tare weight of the Port version boosts its load capacity by about 20%.” The first version of the LH 110 will start volume production early in 2017, but the team in Kirchdorf is already working on additional items of equipment for the new model. “It’s typical of us engineers”, says Bernd Wager. “We spend a lot of our time thinking about product innovations that could improve customer benefit still further!”



Tobias Riedmiller and Monja Albrecht during the new machine's concept stage



Design work on the computer: Dennis Einsiedler, Engineer



Sarah Wetzel and Bernd Wager examine a hydraulic installation



The smart refrigerator can be controlled directly from a tablet or smart phone

The networked refrigerator is coming

Last year Liebherr took the initial step in the direction of a digital commercial model in the domestic appliances product area. With the “SmartDeviceBox”, available as an option, Liebherr-Hausgeräte can now supply a means of networking many of its refrigerators and freezers.

How does Andreas Giesa, “Connectivity” Project Manager at Liebherr-Hausgeräte Ochsenhausen GmbH, Germany, view this innovation? “Networking our appliances establishes a fundamental basis for a digital commercial model. The hardware and software have been developed and the underlying IT structures are in place. Now comes the next step with the focus on additional innovative features.” With its internet connection, the SmartDeviceBox can contact the owner of an appliance by e-mail if it detects a malfunction – for instance, if the refrigerator door is accidentally left open. The customer can then react quickly to ensure optimal storage of groceries. He or she can also regulate the temperature and the refrigerating programs with a tablet, smart phone or other terminal.

The “MyLiebherr” portal gives registered customers one-click access to after-sales service. A service staff employee can be reached directly and can check the appliance’s data by computer and make a remote diagnosis.

Both Liebherr and the customer benefit from this new principle, which avoids loss of time.

Since this is a complex topic, the development team from Liebherr’s domestic appliances division cooperated closely with other specialist areas, in particular the Group’s IT experts. For the connectivity project innovation can be regarded not only as the target, but also as the correct way to achieve it. The project team tackled the task flexibly: only the objective was clear from the beginning, the process itself was shaped by the very latest developments. Andreas Giesa explains: “Aligning Liebherr-Hausgeräte as a provider of digital services confronted us with totally new challenges, for which we needed a new development process and new concepts. But the benchmark for the project remained the customer, whose lifestyle and requirements we had to take into account when we developed our new technology.”

Martin Rogg from Liebherr-IT Services GmbH in Kirchdorf an der Iller, Germany, agrees. “This is the background for several new developments we’re working on – for instance an ‘app’. In order to compile a shopping list automatically in the future, it would be necessary to register the items of food in the refrigerator. The user would then only need to look at his or her smart phone to see what is needed.”



The SmartDeviceBox is simple to install and operate



After-sales functions can be selected easily on the customer portal



Networked experts: members of the core team from the domestic appliance and IT business areas

A project such as this runs up against a special problem: a refrigerator is designed to last for a very long time, whereas communication technologies are sometimes out of date within a matter of months. For this reason Liebherr has developed the SmartDeviceBox, which can easily be inserted into or removed from the refrigerator. New software can then

be loaded, and the appliance remains always up to date. Martin Rogg: “Customers who buy our smart refrigerators are making a reliable investment in the future. Liebherr’s typical ‘long-term thinking’ approach blends perfectly with its claim to technological leadership.”

Technology transfer on rail

An air conditioning system that uses the surrounding air as its medium – an absolute quantum leap forward in the rail vehicle manufacturing industry. Unlike conventional systems, this one needs no refrigerant and imposes no burden on the environment. The aerospace industry has already decided in favour of such systems. Following an enquiry from Deutsche Bahn (German Rail) at the end of 2013, work began on adapting this technology for rail use. The team at Liebherr-Transportation Systems GmbH & Co KG in Korneuburg, Austria, based its plans for a rail-vehicle air-cycle air conditioning system on work previously carried out by colleagues in Lindenberg, Germany.

Deutsche Bahn's target is an environmentally acceptable, reliable and more efficient air conditioning system for the first build of its ICE 3 high-speed passenger train fleet. Avoiding adverse effects on the environment was at the top of the list of priorities, since the promotion of 'green' technologies is one of Deutsche Bahn's future projects.

For the Liebherr team too, protecting the environment was a powerful motive. "Even when we were still at the bidding stage, our enthusiasm for pro-environmental technologies got us off to a flying start", says Alexander Foederler, Project Manager in Korneuburg. The installation that Liebherr has developed for these Deutsche Bahn vehicles has only a few components and is therefore lightweight, compact and easy to service. Alexander Foederler: "Low operating costs and minimum overall energy consumption are important factors, but maximum reliability is an absolute essential." Air-cycle systems have been used on aircraft for some time, but they are new to the rail transportation area, and currently the only alternative to those containing a chemical refrigerant.

Transferring the air-cycle system to a rail-vehicle setting was the first joint project for the six members of the core team seconded from the Design, Purchasing, Industrialisation and Quality Assurance departments. However, they all agree that the project took off without problems and went ahead harmoniously. "It was certainly a good idea for us to occupy a single project office, and to move directly into the



Martina Kreuz and Michael Canori examine air conditioning components again before the initial sample test

manufacturing area when the prototype was being built”, convincing words from Michael Canori, Managing Engineer in Korneuburg. Some of the team had only joined the company a few months previously when a bid for the first build of the ICE 3 had to be submitted at the end of 2013. But Alexander Foederler is convinced: “Companies with a long tradition like Liebherr need employees of long standing who have acquired the necessary know-how over a lengthy period. But there are also times when a fresh wind has to blow, because projects like this one call for a dynamic approach and new ideas.”

The team developing the air-cycle air conditioning system for rail vehicles in Korneuburg cooperated closely with the customer and with its Liebherr Group colleagues in Lindenberg. In March 2015 the first pro-environmental cold-air system was delivered for installation on an ICE 3 high-speed passenger train. In the summer of that year trials lasting several months started, with the train operating according to a

regular daily schedule. In order to collect extensive operating data, the team from Liebherr Transportation Systems installed various sensors and measuring devices on the air-cycle installations. Performance was scrutinised especially closely in the hot summer months of July and August.

The collected data was analysed very thoroughly in cooperation with German Rail before the official trial phase came to an end in September 2015. Alexander Foederler comments on the results: “As well as environmental acceptability, the railway company attached great importance to a high level of reliability. Both these requirements were confirmed by the trials, and we can now offer the customer a ‘green’ alternative system that needs no refrigerant.” Looking ahead, the Korneuburg-based team is already working on plans to adapt air-cycle air conditioning technology for other mobile and industrial applications.



Joint planning of the delivery chain



Already on trial in this train: the new air conditioning system



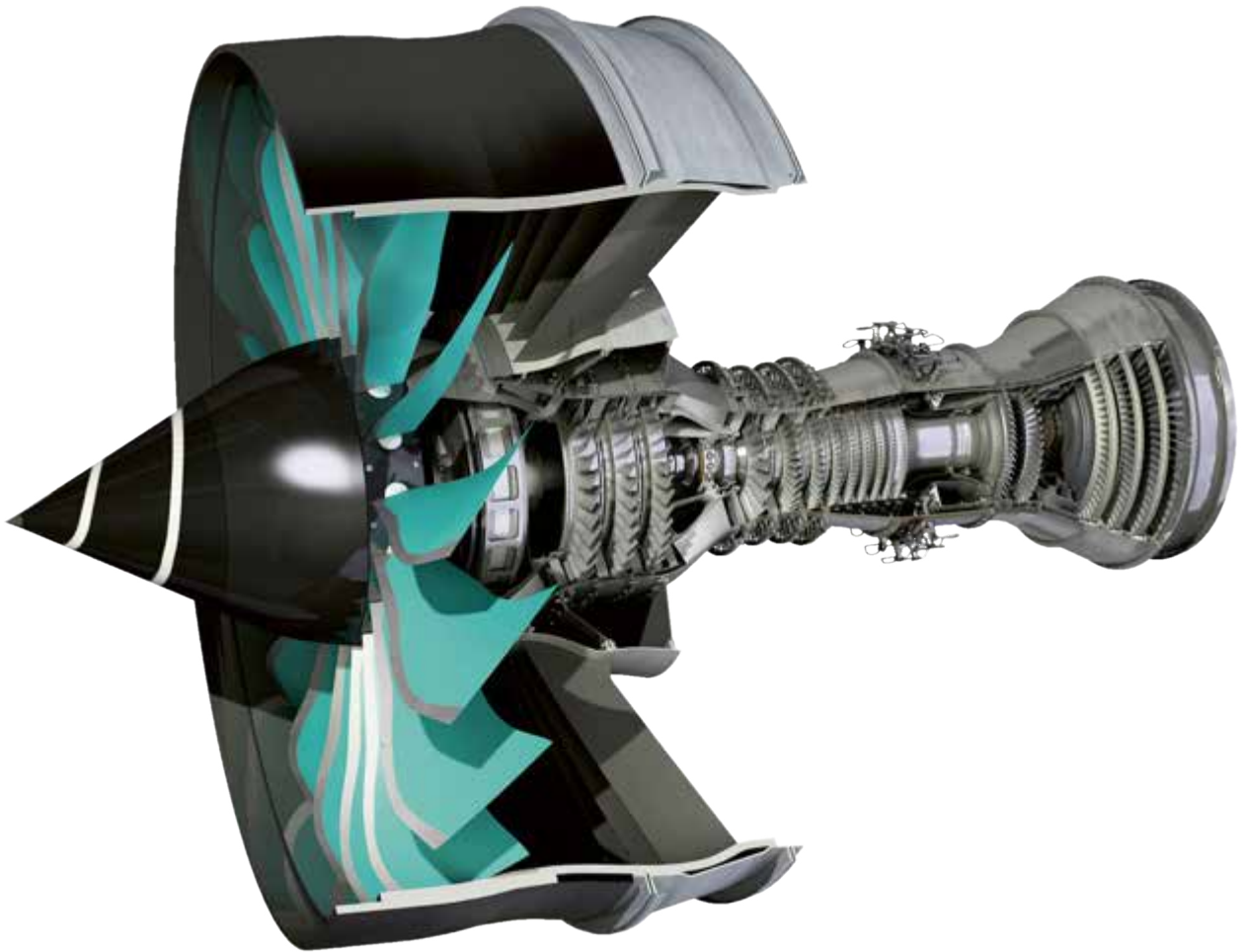
Environmentally acceptable technology and the team behind it: Michael Canori, Kristina Schmidt, Martina Kreuz and Alexander Foederler with the finished product



Joint Venture

On Course for the Future

The highly reputed British engine manufacturer Rolls-Royce plans to launch a new engine design, the UltraFan™, by 2025. It is to combine outstanding performance and fuel consumption in a manner not so far achieved in the aviation industry. With this objective in mind, Rolls-Royce looked for an experienced, well qualified partner in gearbox manufacturing – which led it to Liebherr-Aerospace. The companies have now set their sights on the future by forming a joint venture.



© Rolls-Royce

The UltraFan™ engine design is based on technologies that could be in operation by 2025

Rolls-Royce's vision is to be the market leader in high-performance propulsion systems and with its engineers' expertise, its global activities and its business sector know-how to be in a position to maintain an excellent relationship with its customers providing them with the solutions they need. Rolls-Royce counts over 400 aviation and leasing companies in more than 120 countries amongst its customers.

The company intends to offer them an aircraft engine that sets new standards of performance and efficient use of energy. Compared with the first version of the Trent engine family, the new UltraFan™ design will consume at least 25 % less fuel. In the words of Dr. Norbert Arndt, Rolls-Royce's Executive Vice President Structures & Transmissions: "Airlines will be able to reduce their operating costs significantly, and there will be other advantages too, namely reduced NO_x emissions and a noise carpet distinctly smaller in area."



Heike Liebe (right) and Dr. Rob Harvey are the joint venture's General Managers

An important UltraFan™ design component is a power gear drive train of a size and complexity not previously attempted. To build this gearbox, Rolls-Royce looked for a partner with the practical ability to interpret its innovative draft design in practical shopfloor terms. For its UltraFan™ project, however, the British company group was not searching for technical production know-how alone. In view of the lengthy development phase – up to ten years – it was at least as important to guarantee reliable cooperation over this period.

Rolls-Royce and Liebherr combine their relevant know-how

"Aerospace Transmission Technologies GmbH" is the name chosen for the joint venture that will develop manufacturing technologies for the gearwheels in this new gearbox. When installed on a typical engine for a long-distance airliner, the gearbox will be required to transmit as much power as 500 midsize car engines. Dr. Norbert Arndt defines Rolls-Royce's role in the joint venture's work as follows: "As one of the world's leading manufacturers of propulsion systems we have immense experience in the use of gear drive trains. We have already installed them on many thousands of engines all over the world. For this reason Rolls-Royce will be responsible within the joint venture for design definition in each successive phase, integration of the power gear drive train and testing activities."

Liebherr will contribute its extensive production technology know-how, including the competence possessed by Liebherr-Aerospace Lindenberg GmbH. This production company, based in Lindenberg and Friedrichshafen, manufactures integrated systems for the aerospace industry and supplies landing gear systems, flight control and actuating systems to all leading manufacturers of aircraft and helicopters. Specialised know-how in the gearbox production area will come from Liebherr-Components Biberach GmbH. Its factory in Biberach produces drive components of high quality, and delivers 35,000 gearboxes and rope winches annually, as well as other related components.

The joint venture also benefits from the Liebherr Group's machine tools and automation systems division in Kempten, Germany, which has for many years built the gear shaping machines and tools that are used to manufacture these gearboxes. According to Arndt Schoenemann, Managing Director at Liebherr-Aerospace Lindenberg GmbH: "Our combined specialist knowledge in aviation, large gearboxes and machine tool construction puts us in an ideal position to apply our production techniques to the new power gear drive train." In the course of the joint venture Liebherr will explore new territory and add another highly advanced, innovative technology to its activities.

Specific milestones to the finished product

The joint venture partners hold equal shares in Aerospace Transmission Technologies GmbH, which has its headquarters in Friedrichshafen on Lake Constance. The joint General Managers are Heike Liebe from Liebherr-Aerospace and Dr. Rob Harvey from Rolls-Royce. Its engineers are currently taking over product planning, technical documentation and

iteration from Liebherr. To suit the needs of the large UltraFan™ engine, the basic technology used in smaller engines has to undergo a quantum leap forward. Arndt Schoenemann: "This is uncharted terrain for us. To master the technological challenge, we will optimise suitability of the gearbox for production and its performance ratings until we arrive at a stable product that can be operated safely and reliably on scheduled air services." Before this, a series of milestones

have to be passed: one is the new power gear drive train testing centre. This will be built at Rolls-Royce's German location in Dahlewitz, where more than 100 engineers are already working on development of the gearbox. This is scheduled to have its first trial run in 2016 – a challenging deadline, but one that shows the joint venture agreed by Rolls-Royce and Liebherr to be well on its way into the future.

"Many parallels from the start"

Three questions to Dr. Norbert Arndt, Executive Vice President Structures & Transmissions, Rolls-Royce



Dr. Arndt, UltraFan™ stands for the Rolls-Royce engine concept of the future. How will the airlines benefit?

Our UltraFan™ engine concept will achieve a significant increase in thrust efficiency. Compared with the first member of the Trent family, the Trent 700, the UltraFan™ design will use about 25% less fuel. This improvement in consumption will directly benefit the airlines' operating costs. In addition,

NO_x emissions will be lower and the noise carpet smaller. The UltraFan™ concept therefore makes a major contribution to the achievement of our "Flightpath 2050" targets.*

Which technological challenges will the new joint venture have to overcome before it can manufacture the power gear drive train for the UltraFan™ engine?

The power gear drive train for the UltraFan™ engine will set new standards in its power-output category for power density, that is to say torque transmission related to installed space and weight. It is therefore essential for the gearwheels that transmit this torque to be manufactured to the very highest quality standards.

Which criteria led to your choice of Liebherr-Aerospace as a partner in the new joint venture?

Rolls-Royce was looking for a competent partner for gear-wheel production, already active in the aviation field and like itself, prepared to devote the necessary time to product development. In our discussions with Liebherr it was clear from the start that the two companies have much in common. We have now established the joint venture and look forward to a long period of successful cooperation.

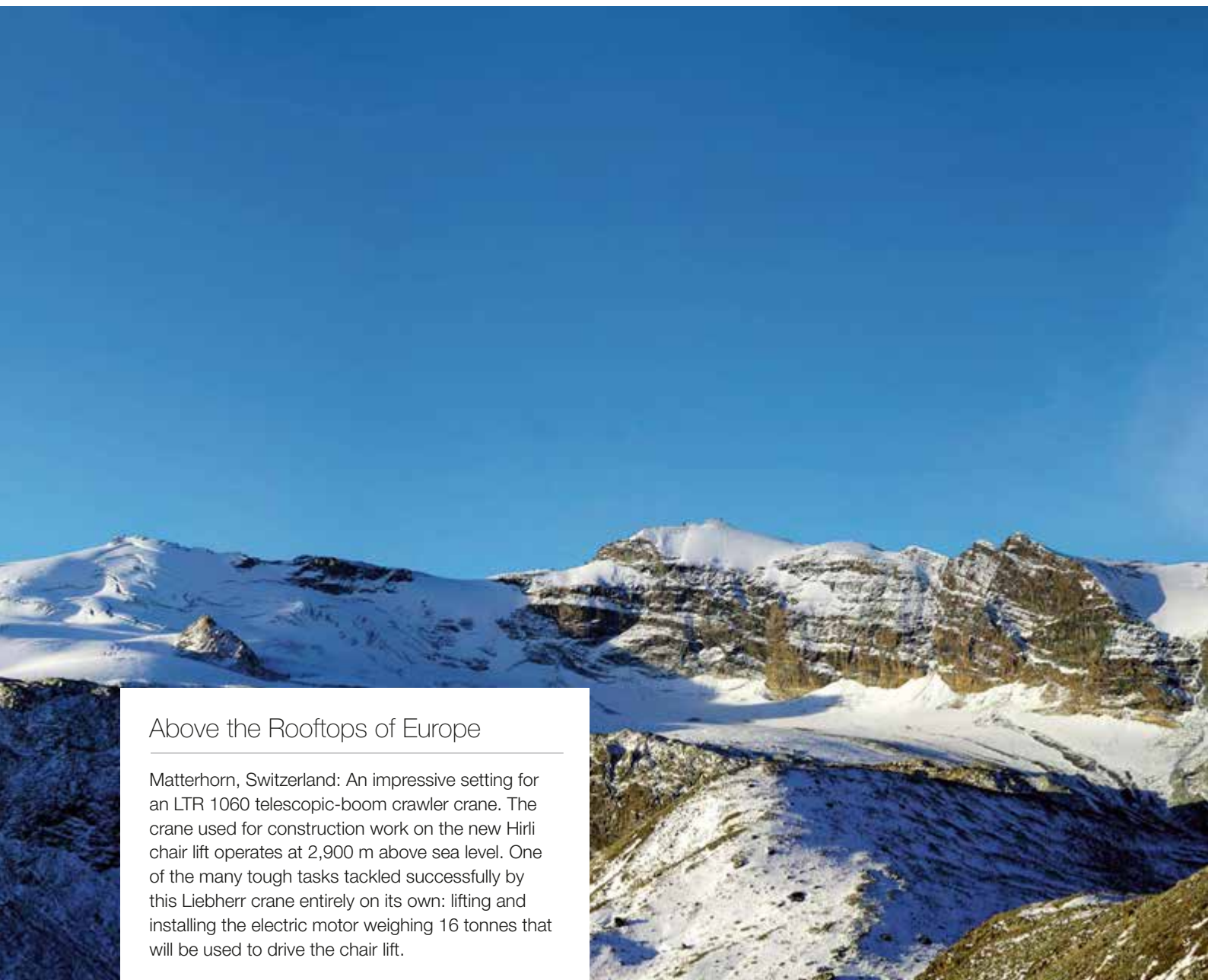
* Flightpath 2050

The European Aerospace Research Advisory Board ACARE has drawn up Flightpath 2050 as a technology road map at European level. Its members come from industry, research and politics. The Flightpath 2050 plan defines aviation research, development and innovation management targets and calls for them to be achieved by midway through the 21st century.

Extraordinary Deployment Scenarios

Action Is What You Get

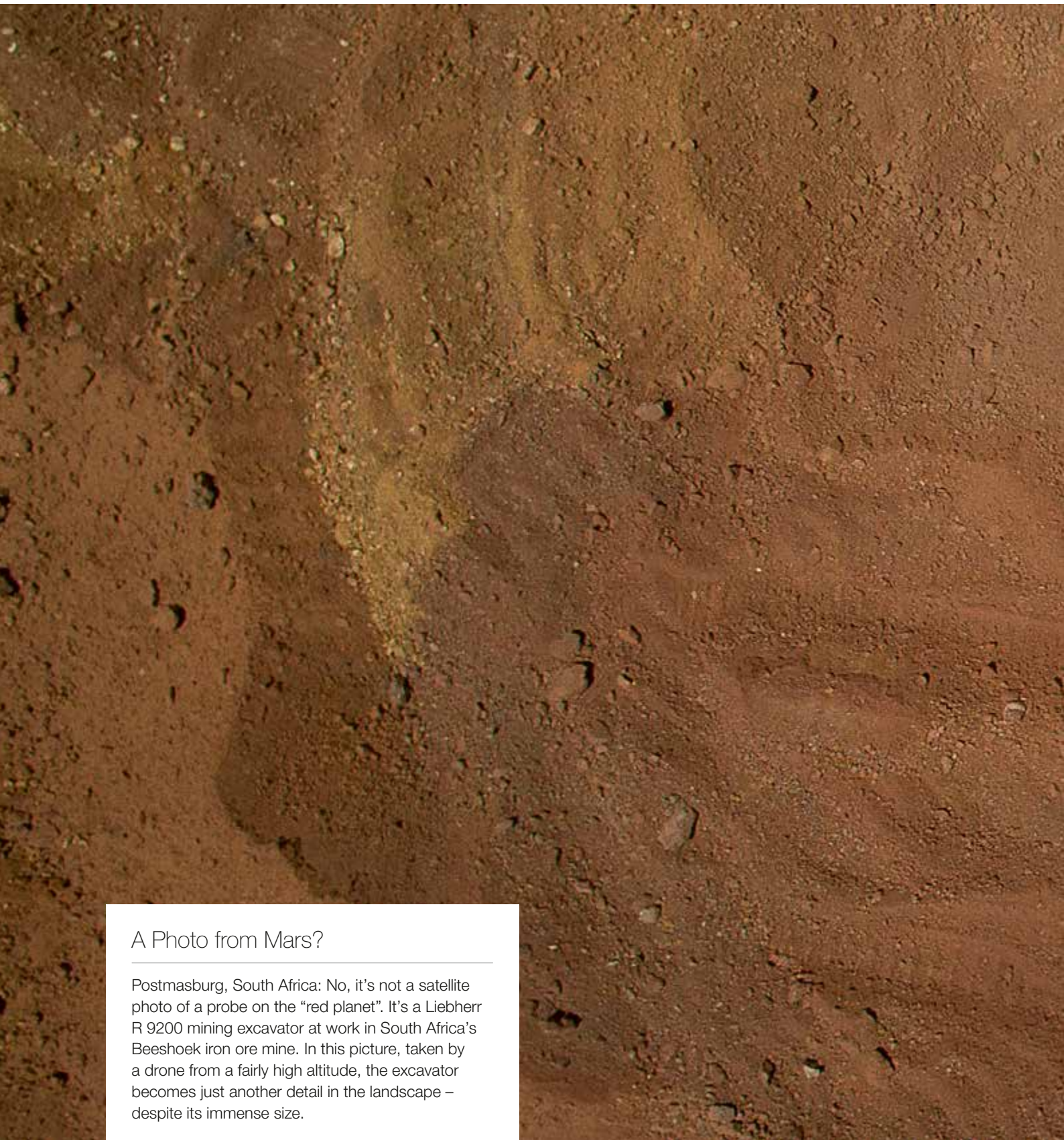
They climb mountains and work reliably on terrain that looks more like Mars than Earth. Construction machinery and mining equipment from Liebherr operates all over the world, in the most widely varying conditions. But with one aim always in mind: top performance that contributes to success.



Above the Rooftops of Europe

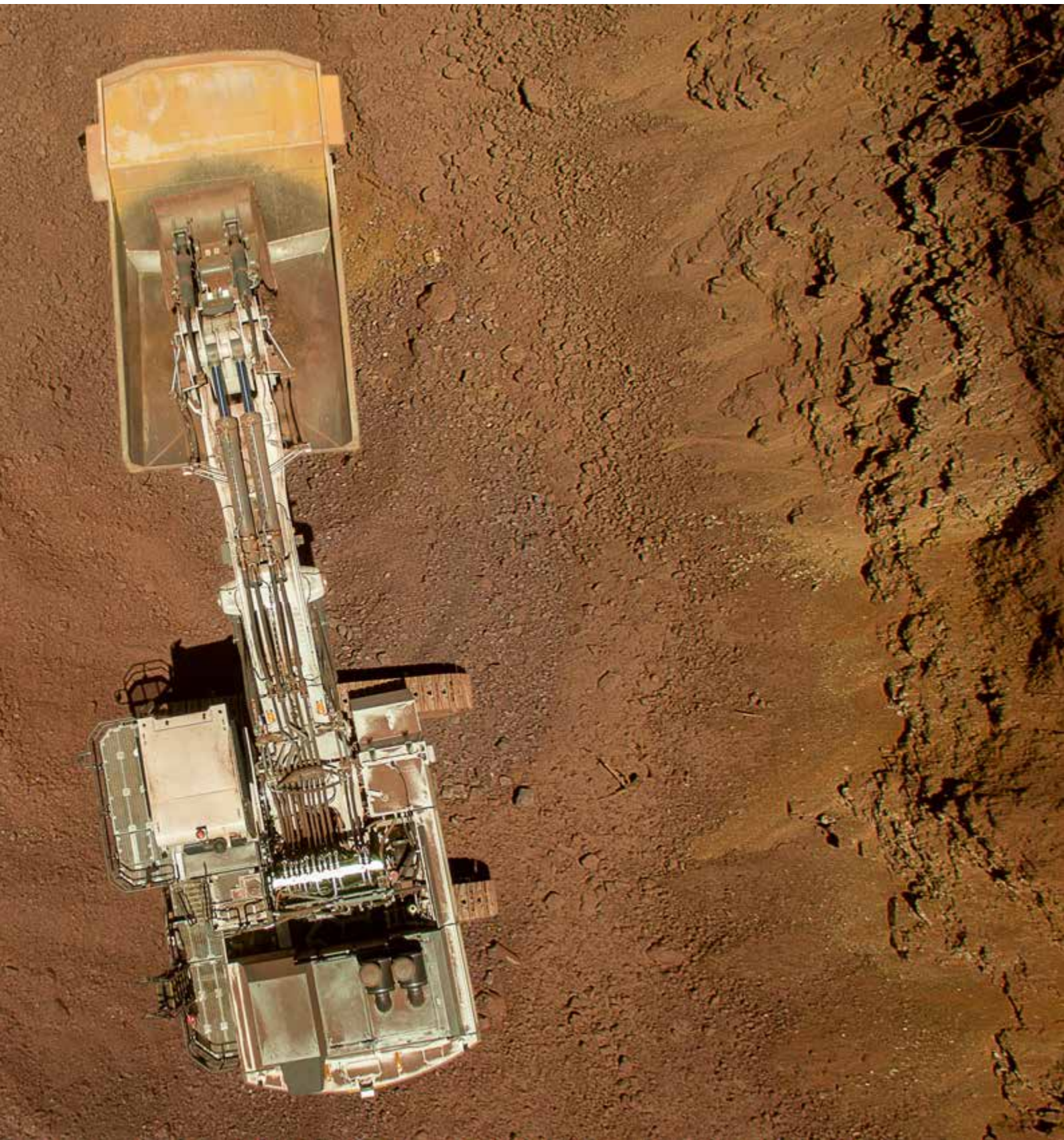
Matterhorn, Switzerland: An impressive setting for an LTR 1060 telescopic-boom crawler crane. The crane used for construction work on the new Hirli chair lift operates at 2,900 m above sea level. One of the many tough tasks tackled successfully by this Liebherr crane entirely on its own: lifting and installing the electric motor weighing 16 tonnes that will be used to drive the chair lift.





A Photo from Mars?

Postmasburg, South Africa: No, it's not a satellite photo of a probe on the "red planet". It's a Liebherr R 9200 mining excavator at work in South Africa's Beeshoek iron ore mine. In this picture, taken by a drone from a fairly high altitude, the excavator becomes just another detail in the landscape – despite its immense size.



Through the Mountain

Aschaffenburg, Germany: Since 1854 trains have passed through the “Schwarzkopftunnel” and under the mountain of the same name in Northwest Bavaria. Such a long tradition is impressive, but the tunnel costs too much to maintain and is to be replaced by a more modern one, due for completion in 2017. Construction work is already in progress, with earth-moving machines from Liebherr playing their part.





A large tower crane is shown against a vast, blue sky filled with soft, white clouds. The crane's lattice structure is visible, extending from the bottom right towards the center of the frame. The overall scene conveys a sense of height and industrial scale in a natural setting.

Peak Performance

Garmisch-Partenkirchen, Germany: At 2,975 m above sea level, the atmosphere is frosty, to say the least. The snow-covered 150 EC-B 6 Litronic flat-top tower crane bears this out. It will be operating on the Zugspitze, Germany's highest peak, until the end of 2017. And since it's 13 m higher than the mountain on which it's standing, Liebherr can claim for some time at least to be the highest point in Germany.



Concentrated Power

A Crawler Crane with Many New Features

When Liebherr starts an innovation process, it is often in response to specific customers' wishes.

"To put these into effect is a welcome challenge for us! In Product Management we draw up the details of what's needed, then pass them on to our Technical Office, which decides on the best way to reach the target." This concise summary comes from Maria Kotzerek, who is Head of Crawler Crane Product Management at Liebherr's factory in Nenzing, Austria.



Premiere in Munich, Germany: the new crawler crane in the 100-tonne category at the Liebherr booth

The LR 1100 – innovation as a joint project

Interview with Maria Kotzurek, Head of Crawler Crane Product Management at Liebherr-Werk Nenzing GmbH



Liebherr built the prototype LR 1100 at the beginning of 2016. Can you give us a picture of what form the development process took?

Our point of departure is always what the customer needs. Members of our sales organisation are never far away. Product Management takes note of the customer's requirements and compiles a product specification. What follows then is a structured innovation process; it lays down a direction for us to follow and involves all the specialist departments in the relevant project stages.

What exactly is the advantage of this method of work?

It coordinates different areas of competence. In this case, Product Management had drawn up the requirement specification by the end of 2013, and thus formulated the precise values that the new LR 1100 would have to satisfy. After this our internal Technical Office compiled a corresponding product specification, which acted as a basis for the subsequent development process. The complete design for the new crawler crane, of which we are extremely proud, was the work of our Technical Office. But since a new crawler crane such as the LR 1100 has to function in reality as well as on the computer screen, our colleagues from Production are brought into the picture from the very start. We also have the support of staff from Purchasing, Controlling, Sales and Marketing. And when the finished product leaves our assembly shop and is exhibited at its first trade fair, this is a very gratifying moment for us all.

How does Liebherr test the LR 1100's suitability for its task?

In two stages. The prototype is first inspected on the test rig here in Nenzing. We commission two certification companies to perform this work, and they subject all the new model's qualities to a tough test. Since the LR 1100 is the first model from Nenzing with the new driver's cabin, this is tested directly at the same time, including such aspects as freedom from leaks or the operation of the new air conditioning system. When all these tests have been completed successfully, we invite customers to Nenzing to see the new model in action, or make it available to them for practical assessment of its day-to-day performance potential.

The latest example of this innovation process is based as usually on the user's requirements. A powerful crawler crane in the 100-tonne category was called for; it had to be versatile in its potential applications and easy to move from place to place. The answer is the new LR 1100, a crawler crane available worldwide from the summer of 2016. At every stage, from the initial idea at the end of 2013 to the finished prototype, Liebherr employees contributed their specialised know-how, competence and a wealth of ideas to the project. The result is a model that completes the lower end of the Liebherr crawler crane family – with a totally new equipment concept.

Systematic innovation

From the very earliest stages, LR 1100 development involved input from Innovation Management at Liebherr-Werk Nenzing GmbH, where the construction machinery portfolio consists of crawler cranes, duty-cycle crawler cranes as well as piling and drilling rigs. Andreana Batlogg-Kovacevic heads this department, which was formed in 2012, and sums up its work as follows: "One of the core tasks of Innovation Management is to establish systematic innovation with the aim of achieving transparency and reproducibility. For a new and highly radical development such as the LR 1100, we always pass through all eight phases of the innovative process we have defined. This process is tailored to the standards we

expect our new developments to reach." All relevant company business areas participate in product development, from Product Management, the Technical Office and Production Engineering through Production, Purchasing and Controlling to Sales and Marketing. Innovation Management has a supporting function: to consult with executive staff from Product Management, the Technical Office and Production Engineering during the entire development process. Batlogg-Kovacevic: "Together with Product Management and the Technical Office, specific meetings are planned for the successive phases. At these, development quality and user appeal are examined and compared with scheduling constraints and the resources needed."

Many new ideas were put forward with a view to interpreting the vision of the forthcoming 100-tonne crawler crane more closely, and combining users' wishes in a single new product. For some of the LR 1100's development targets, recourse to the Liebherr Group's existing technologies as used for other machines was possible. Other objectives called for our own in-house development work. Maria Kotzurek: "The key to success is to yield an optimal balance between innovation and function." The LR 1100's new features are the outcome of this process and also impressive evidence of its complexity.



The LR 1100 with its new driver's cabin and swing-out ballast system



Dr. Ilaka Mupende presents the new synthetic-fibre rope

Boosting load capacity

If a crane's load capacity has to be increased, this means optimising its structural steelwork and stability. On the LR 1100 this was achieved by a new steelwork design with the shortest and most favourable power-flow paths. The swing-out ballast system is a genuinely new feature; it acts as a counterweight at the rear of the crane and gives the LR 1100 a higher static moment and about 20 % greater load capacity.

The prototype of a new high-strength rope made from synthetic fibre will also have a direct influence on load capacity; it will reach series-production maturity at the end of 2017. The new rope is very light in weight, extremely strong and winds easily on to its drum. Dr. Ilaka Mupende, Research and Testing Manager at Liebherr-Components Biberach GmbH, Germany, explains its key advantages: "It is as strong as a steel rope, with the same load capacity, but as much as 80 % lighter. Operating life is ten times longer, and because it uses synthetic material it does not need to be protected against corrosion." This high-strength synthetic-fibre rope will be available in the future as an option for the new LR 1100 and other models too. It is the result of a development project in which crane experts from four Liebherr Group companies with extremely different product priorities joined forces with Teufelberger, a rope manufacturer.

Easier transport, quicker assembly

To move a crane from one place to another, the catwalks on the cabin and in the servicing area often have to be removed. The LR 1100 crawler crane has no such problem: they are simply folded out of the way. The boom foot and crawler track assemblies stay in position when the crane is moved to a new site. With the patented "boom foot manipulator" the crane's transport headroom can be reduced even further – a decisive advantage when it has to pass under low bridges or be moved through a hatch into a ship's hold. Ease of transportation and rapid assembly at the worksite make the new LR 1100 an ideally versatile machine.

For all such innovations as these, Liebherr never departs from the principle that safety comes first and foremost. The LR 1100 uses the latest Litronic control system. This has an integrated load-moment limiter and calculates load capacities automatically during operation. This is of great benefit on smaller crawler cranes in particular, since they have to tackle a wide range of tasks and their configuration changes repeatedly. Above all, users on construction sites will value this feature if the LR 1100 has to be operated in a seldom-used position or at an unusual working radius.

The additional features that Liebherr installs on its crawler cranes are perfectly integrated into the control system. Options on the LR 1100, for example, include two new assistance systems that Liebherr has developed: with the "Vertical Line Finder" the rope can be seen to be absolutely vertical before lifting the load, so that there is no risk of

it swinging. “An invaluable safety feature if the load is too far away or unevenly distributed, or if boom flexing makes it impossible to see that the rope is at an angle. If the hoisting movement is continued, the load could swing out of control.” This explanation comes from Walter Mietschnig, Manager of the Crawler Crane Product Development area. The Vertical Line Finder, incidentally, is especially useful for tandem lifting operations: since the system detects if a rope is not vertical, the crane operator is able to avoid possibly excessive lateral loads on both cranes.

With the second assistance system, the “Horizontal Load Path”, loads can be moved efficiently and accurately along a horizontal path to the point where they are to be set down, even if this point is difficult for the crane operator to see. Walter Mietschnig: “Our Litronic control system is known to be user-friendly. We have applied the same principles to the two new assistance systems, and made them easy to operate and highly automated.”

The LR 1100 has many new features in other areas too, for instance enhanced comfort and convenience for the operator. Andreana Batlogg-Kovacevic: “We can reasonably claim that the LR 1100 is a highly radical new model. It illustrates the level of additional customer benefits that can be achieved. Our aim when we undertake a project of this kind is to move forward into new areas and be the leaders in innovation.”

New solutions for the digitised construction site

To decide on the most suitable construction machine for a specific task is often far from easy. With its Crane Planner software, Liebherr supports customers when construction projects are planned and equipment selected. The correct answers depend on various data obtained from digital survey models or BIM (Building Information Modelling). The data enables the most suitable crane – for example the new LR 1100 – to be selected. Closely linked with the Crane Planner is the LiPOS system, which determines the precise position of a machine on the construction site. If the user company compares Crane Planner and LiPOS data, it can arrive at the optimal work sequences: planning, validation and implementation are then digitally networked. This shortens the processing paths, cuts machine operating times and prevents errors when the construction work is carried out.



The Vertical Line Finder ensures a perfectly vertical lift

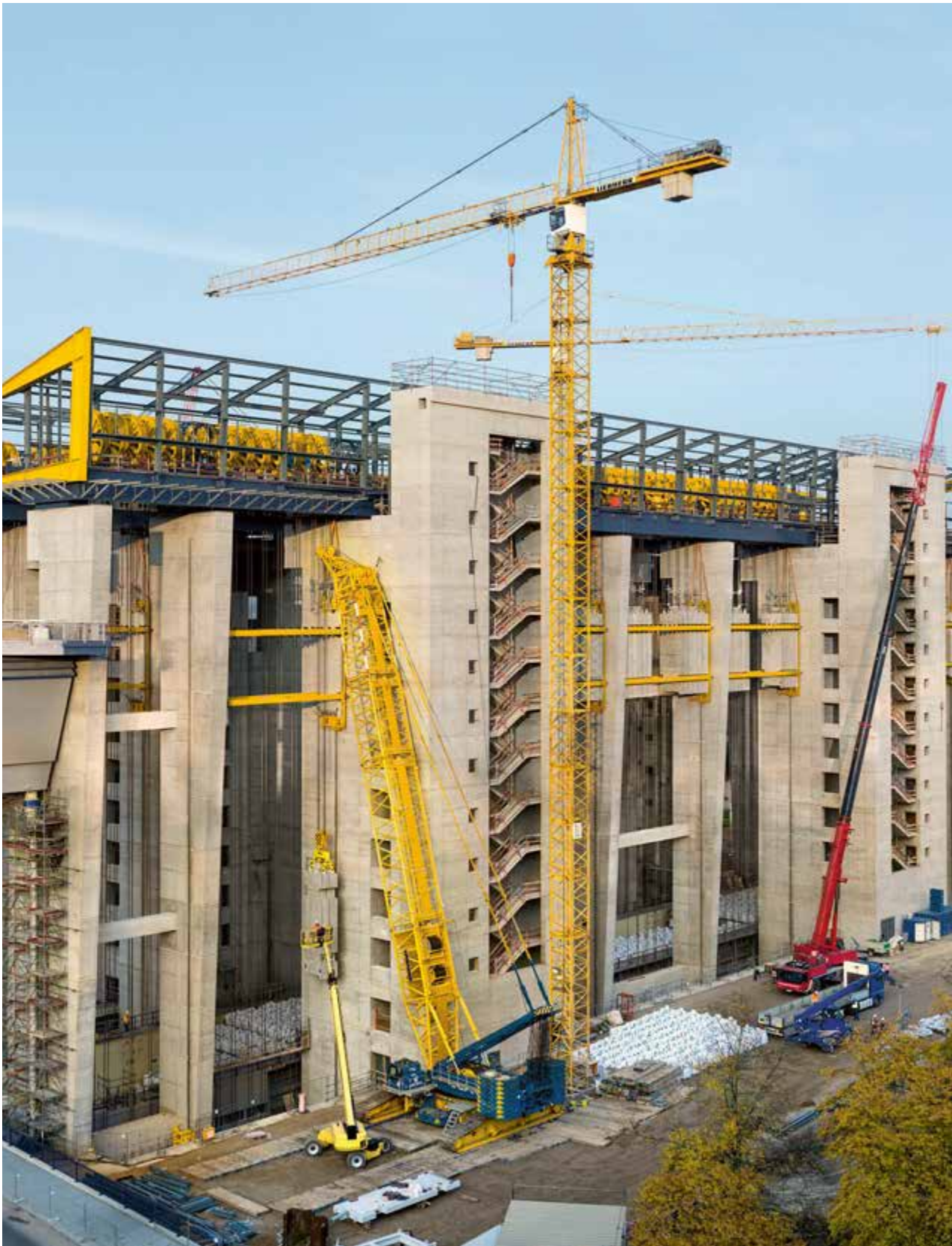


Support for accurate horizontal movements of loads

Individual Service

Close to the Customer

Liebherr regularly carries out complex projects successfully. Its service experts cooperate closely with the customer to obtain the best possible results. Here are some examples of this effective procedure in the mobile and crawler cranes, transportation systems and mining areas.



Three types of Liebherr cranes work on this construction project



An LR 1600 / 2 in action

Helping to build Germany's largest ship lift

Germany's largest ship lift is due for completion in 2017. As the name implies, it raises ships like a lift or elevator in a single operation and overcomes a difference in height that would otherwise need a succession of conventional locks. There is already a ship lift dating from 1934 in Niederfinow, but the new lift replacing it will accommodate larger ships, up to 110 m long and 11.4 m wide.

For the construction work necessary, Liebherr-Werk Ehingen GmbH, Germany, supplied two Type LR 1600/2 crawler cranes – and a lot of know-how and practical experience. The cranes were used to install the 220 counterweights that raise the giant trough with the ship inside. Together, the concrete counterweights weigh about 10,000 tonnes and are suspended from rope pulleys.

Another special feature of this project was that the customer asked for a special masthead or “nose”, 5 m long, with a load capacity of 104 tonnes. This special unit was developed and built at Liebherr-Werk Ehingen GmbH. Steffen Schwertle, Construction Engineer in Ehingen, recalls: “We had to determine the correct design ratings and check that the necessary load capacity would be achieved.” He also supervised the on-site work. “A major challenge in Niederfinow was the high level of sand in the soil. We had to stabilise it sufficiently to accept the crane’s operating loads.” Another problem, solved successfully, was getting the two cranes as close as possible to the lift structure. The crane booms had to be manoeuvred under the ship lift to an accuracy of just a few centimetres. Schwertle: “We had to avoid any risk of the lift mechanism losing its equilibrium. We did this by filling the trough with sandbags to simulate the ship’s weight.”



The ship lift's main axis



Steffen Schwertle, Construction Engineer

Direct support for a non-stop operation

In Kalimantan Timur, an Indonesian province, the rainy season lasts from September to March. In the course of the year, 2,200 litres of rain fall on every square metre on average. This is not only a major factor influencing day-to-day life; it also has to be considered when construction machines are operated. In the mining area, a second challenge has to be faced: round the clock operation.

A coal mine on the east coast of Kalimantan currently operates a large number of Liebherr machines more or less continuously: 19 Type R 996 and R 996 B large hydraulic excavators, three giant excavators of Type R 9800 and 31 Type T 282 B mining trucks. The trucks have a service weight of up to 600 tonnes and are the largest built by the Liebherr Group.

The R 996 and R 996 B excavators, for example, account for 70% of the material extracted, and therefore directly determine the mine's productivity. If a machine comes to a halt unexpectedly, the mine operating company's earnings are at risk.

This explains why employees from the Indonesian Liebherr company are on site 24 hours a day. They check the machines and monitor their performance, draw up maintenance schedules and supply spare parts if needed. They renew components and eliminate defects. In the words of Rick Lockyer, production manager at PT. Liebherr Indonesia Perkasa: "We're right there if needed. This keeps maintenance costs down, and the machines can start work again much sooner." Thanks to this efficient servicing concept, a standard maintenance routine for a Type R 996 excavator, for example, is possible in a minimum time of only four hours. Liebherr has supported the mining company in this way for the past 20 years: employees of PT. Liebherr Indonesia Perkasa took over this maintenance work in 1996, and the team has now grown to 170 people.



The PT. Liebherr Indonesia Perkasa service team



A well organised team: excavator and mining truck

Greater journey comfort – a shared objective

“A pleasant climate in the train adds greatly to journey comfort. Air conditioning manufacturers and the companies that build and operate the trains are all agreed on this”, says Alan LePatourel, UK Sales Director at Liebherr-Transportation Systems. “At Liebherr, we therefore attach the greatest importance to keeping our air conditioning systems operational, reliable and in perfect condition.”

Consistent development work is one factor that boosts availability, but effective after-sales service is also essential. Liebherr cooperates directly with train operators and manufacturers. The Group’s transportation systems product area signed a major long-term contract at the end of 2015: Siemens PLC commissioned Liebherr to perform maintenance work, initially for a period of ten years, on the new Class 700 urban train fleet. This comprises 115 trains made up of 1,140 vehicles in all, and is due to enter service in the next few years. The Thameslink operating company will use these trains on the north-to-south route from Bedford through London to Brighton.

To optimise customer support, Liebherr has built a new service centre in Gatwick, England. With a site area of 900 m², it is immediately adjacent to the Siemens maintenance depot. From the new centre Liebherr supplies materials, provides support and carries out repair work. Five members of staff are on hand to ensure that customers’ needs are given expert attention round the clock. Since the new centre opened in 2014, the team has already handled several tasks successfully, for instance system maintenance on three complete Class 159 trains for the Wabtec Rail Group. Alan LePatourel has a clear picture of what’s needed: “The air conditioning systems are an essential part of the train’s equipment and therefore have to be serviced without any loss of time. We discussed the work with our customer and produced a joint plan for removal of the equipment, servicing and installation on the trains within one week.”



© Bombardier

Also serviced in Gatwick: trains from the “Southern Electrostar” fleet built by Bombardier



Detail of a cooling component



Inspection of an air conditioning system



System prepared for maintenance

The Family-Owned Group's Hotels

Liebherr Welcomes Its Guests

Hans Liebherr laid the foundation stone for today's Liebherr Group in 1949. His first product was the TK 10 tower crane, but his powers of innovation were not limited to machines for the construction industry. In 1954 he began to manufacture refrigerators as well. The key to Hans Liebherr's business success was his ability to select the most promising idea from those that he encountered at any given time, and develop it with great skill and determination. This explains why he entered a totally different business area: hotels.



"Ard na Sidhe" means "the fairies' hill" in the local language

While visiting Ireland in the late 1950s, Hans Liebherr discovered the lakes in the southwest, near the town of Killarney. It was love at first sight. In 1958 he established Liebherr (Ireland) Ltd., despite the region's rural infrastructure and its distance from the nearest seaport. In 1960 he faced the problem of accommodating employees from Germany, as there was nothing suitable anywhere near his new crane factory. He therefore decided to build his own guest-house, initially for his company's employees and visiting customers. Two years later, Hans Liebherr's instinct for identifying promising markets and sales opportunities led to the guest-house being opened to the public as "The Europe" – making a virtue of necessity, one might say. The owner tackled the task with his customary enthusiasm: guests should lack nothing, the rooms were generous in size, the service was to be courteous and helpful. One of Hans Liebherr's personal preferences was for the premises to be spacious in their layout. His son Willi Liebherr remembers that nothing irritated his father more than "if you're walking down a hotel corridor with a big suitcase and someone comes the other way, you can't

get past them!" Hans Liebherr built a second hotel in 1965, "The Dunloe", close to the ruins of Dunloe Castle and not far from his first hotel. The pace of development speeded up still further when the "Ard na Sidhe Country House" opened, a luxurious country house dating from 1913, on the shore of Caragh Lake, Killorglin.

Hans Liebherr took immense care to ensure that each of his hotels retained its unique charm and was situated in spacious grounds close to nature. The target customer profile also changed: instead of hosting crane drivers or members of the staff of construction companies who tended to weigh performance against economy, guests with widely varying preferences began to arrive and needed to be won over. In these three hotels, Hans Liebherr and his employees offered visitors to Southern Ireland a high standard of accommodation. For twenty years these establishments in County Kerry were the Group's only hotels.



The redesigned foyer of "The Europe Hotel & Resort"



The lounge of the “Löwen Hotel Montafon”, which was completely renovated in 2013

The largest hotel in the Alps takes shape

Hans Liebherr took the initiative in 1981 and began to plan a new hotel, an imposing three-wing edifice on a mountain-top not far from Telfs, Austria. But numerous obstacles had to be overcome first. It took several years to obtain a building permit for this exposed site. Helmut Kopp, then Mayor of Telfs, recalls: “There was no stopping him. He simply had to have his hotel.”

The plans tell us that in his heart of hearts Hans Liebherr remained a master builder. He determined even the smallest architectural and interior design details of “his” hotel personally. Isolde Liebherr remembers this period well: “We must have visited at least ten manufacturers in South Tyrol before we bought the tiles for the fireplaces, stoves and floors. To find the right marble for the bathrooms, my father drove down to Italy. He even chose the parquet floors and wall-to-wall carpeting himself.”

By 1985 the “Interalpen-Hotel Tyrol”, Hans Liebherr’s vision of a hotel for Austria that would not merely be large but grand

in every other respect, had become reality. True to his space concept, every double room has a floor area of at least 45 m² and a balcony. The hotel’s cuisine is superb and its location in the midst of the Tyrolean mountains quite magnificent. It provided jobs for many local people and, when it opened, was Austria’s most environmentally acceptable hotel, for instance with its own heat recovery system. The aim was to keep the building’s influence on nature as low as possible. All cars are parked in an underground garage, to avoid unsightly parking lots. With 282 rooms and suites, this hotel was still the largest in the Alps in the early 21st century.

A passion for the hotel industry

This was not to remain the Group’s only hotel in Austria: the next acquisition, in 1982, was what is now known as the “Löwen Hotel Montafon”, situated in Schruns in the south of the Vorarlberg region. To round off the hotel family, the “Hotel Falken” in Memmingen, Germany, was also acquired. Hans Liebherr allowed the hotel managements to operate more or less independently of the other Group divisions, though he insisted on Liebherr’s high quality standards being



Hans Liebherr, master builder – seen here discussing the “Interalpen-Hotel Tyrol”



Hans Liebherr with Barbara Mayer, who was the hotel's first Director

maintained. This policy was continued by Hans Liebherr's daughter Isolde Liebherr when she took over responsibility for the Group's six hotels in 1993. She has developed them continually in order to take guests' changing preferences into account. The Interalpen-Hotel Tyrol, for example, now has the most extensive “wellness oasis” in the entire Alpine region, with a floor area of more than 5,000 m² – worthy in every respect of the hotel's place among the 450 “Leading Hotels of the World”.

High levels of investment and innovative power are common to all the Group's product areas. The hotel trade is not

only vigorous but also constantly changing. Hotels have to be modernised and renovated regularly if they are to keep ahead of the rest. Isolde Liebherr sums this up well: “It's important to identify trends in the sport, cultural and spa areas and put them into practice without delay. Quality can be considered as a permanent trend, just like personal contact, true sincerity and hospitality.” The third family generation is currently taking on management duties since, as Isolde Liebherr says: “As with all the other Group companies, we intend to keep the hotels family owned.”



Isolde Liebherr with Director Karl Brueggemann at the event held to celebrate the Interalpen-Hotel Tyrol's 30th anniversary

Progress and Outlook

The Group in 2015

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Business Progress

The Group in 2015

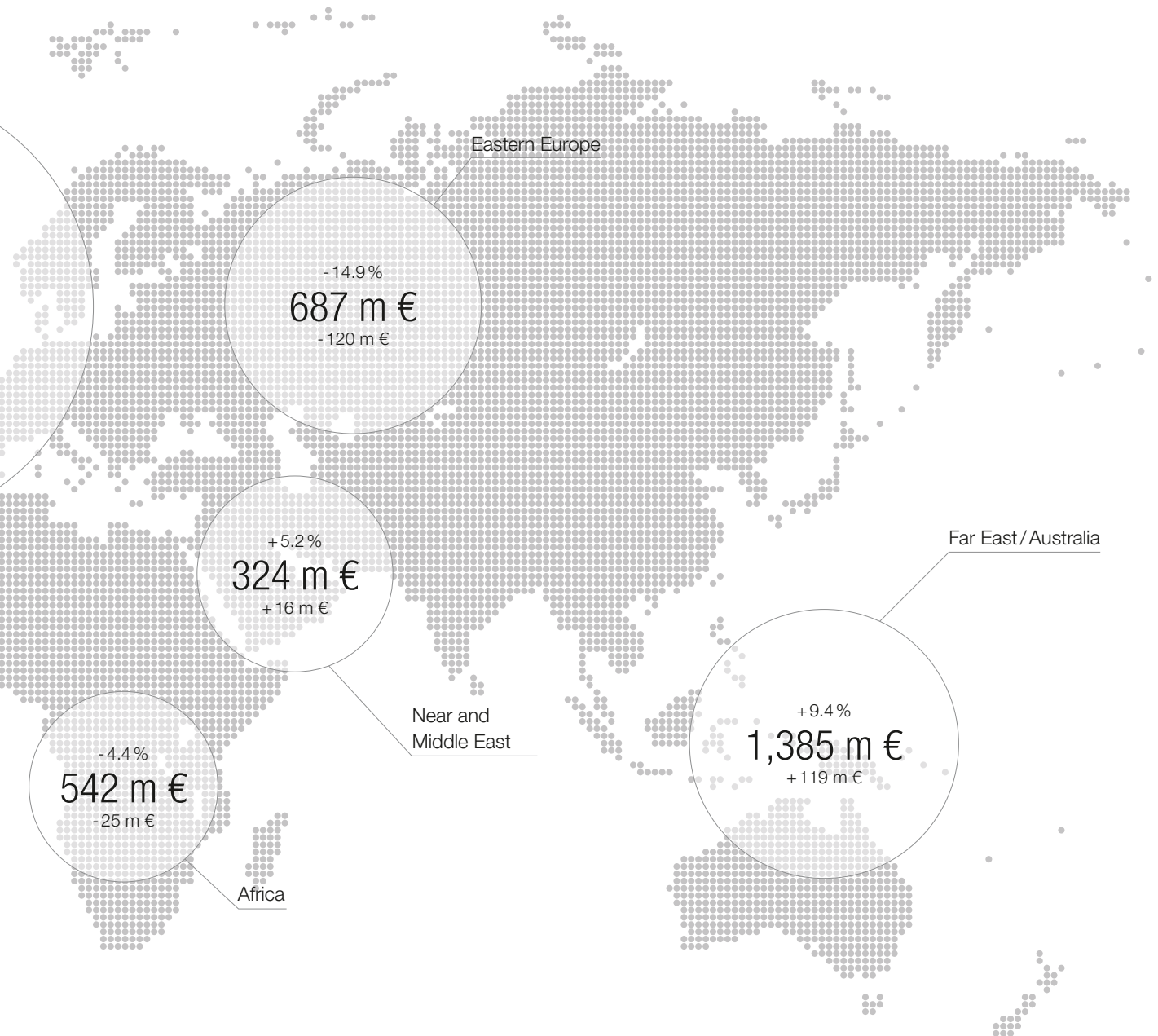
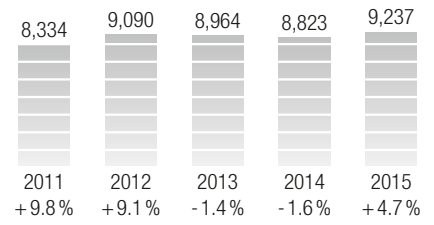
Liebherr's total turnover in 2015 was 9,237 million €, the highest figure in the Group's history and an increase of 414 million € or 4.7% compared with the previous year.



+4.7%
9,237 m €

+414 m €

Turnover worldwide m €

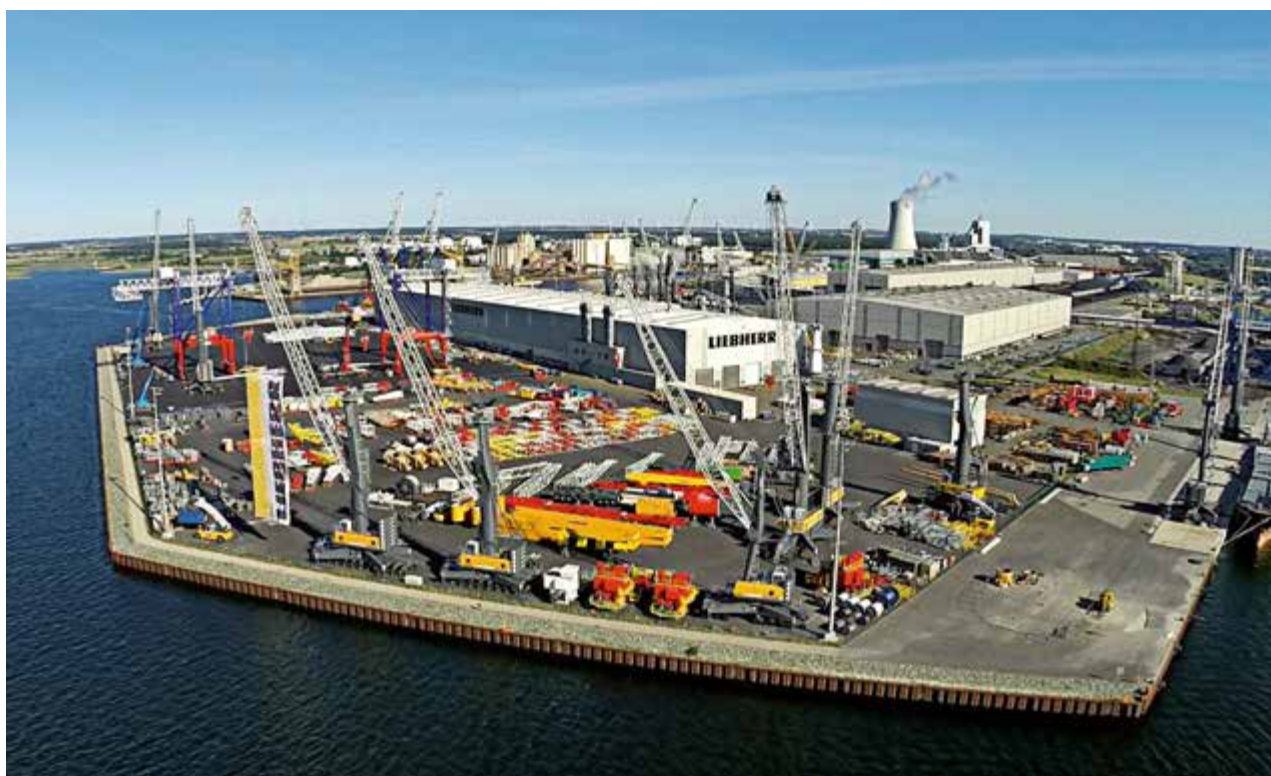


Worldwide economic growth lost some of its momentum over the past year: after 3.4% in 2014, the figure last year was 3.1%. Whereas growth in the industrial nations as a whole was 1.9% and therefore slightly more positive than in the previous year, it worsened again in the emerging markets and developing nations and was in the region of 4.0%. The economic slowdown in China also had an adverse effect on growth in other countries; Brazil and Russia were even in a phase of recession.

Developments in turnover according to region

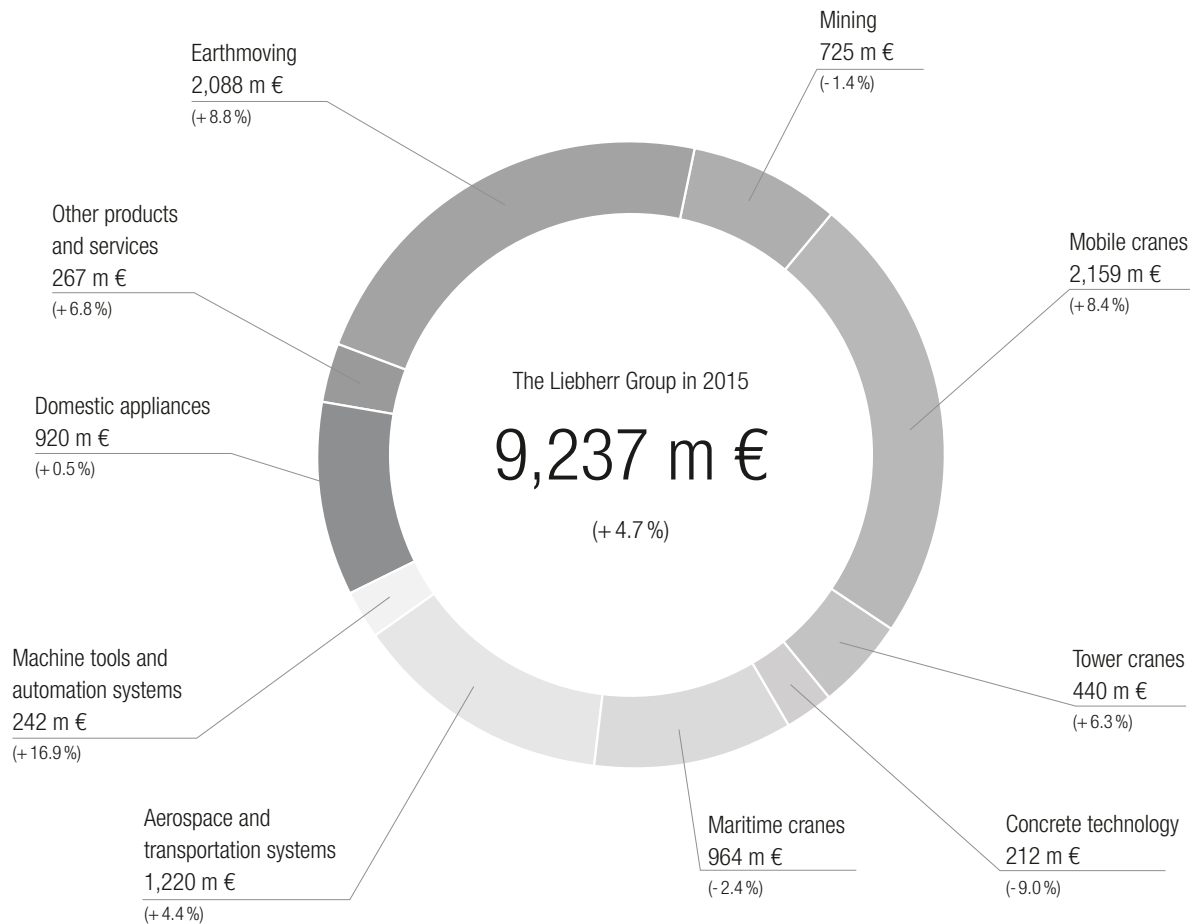
Business developed quite differently in the various sales regions: in Western Europe, the most important of these for Liebherr, an increase in turnover was recorded. Among the contributing factors were positive developments in Germany, Great Britain and the Netherlands. Sales revenue dropped, however, in France, the Group's third-largest market.

Turnover increased in volume in America and in the Far East/Australia region, and Liebherr also enjoyed a satisfactory year in the Near and Middle East. A downturn was recorded in Eastern Europe and on certain African markets.



Liebherr site in Rostock, Germany

Turnover by product groups (variation compared to the previous year in %)



Developments in turnover by product areas

Liebherr achieved growth in the construction machinery and mining area and also in the area comprising maritime cranes, aerospace and transportation systems, machine tools and automation systems, domestic appliances, components and hotels. Turnover from construction machinery and mining equipment, including the earthmoving, mining, mobile cranes, tower cranes and concrete technology divisions, rose by 330 million € or 6.2% to 5,624 million €. Sales revenue in divisions not included in the construction machinery and mining area rose by 84 million € or 2.4% to 3,613 million €.

Results for the business year

In 2015 the Liebherr Group recorded a surplus of 294 million €, 22 million € below the 2014 figure. The operating result was slightly above the previous year's level. The financial result was lower, primarily because of negative exchange-rate influences.

Employees

With their qualifications, enthusiasm and dedication, the employees of the Liebherr Group are one of the keys to its corporate success. Liebherr's long-term commitment to the well-being of its employees is based on its tradition as a family-owned company.

In 2015 the workforce increased slightly: at the end of the year, Liebherr employed 41,545 people, 706 or 1.7 % more than at the end of 2014.

Among last year's activities were the new human resources development principles known as "STEP – Learning and Development at Liebherr". They are aimed at maintaining or further developing employees' skills and personal competencies. The e-learning platform available to employees for initial and follow-up training has been extended, and ideas management renewed.

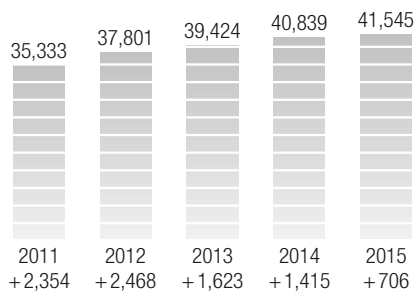
Sustainability

It is the Liebherr Group's objective to generate sustainable value for employees, customers, suppliers and society. As an independent family-owned company, it is in a position to take the long view, and is aware of its responsibilities. It is dedicated to sustainable development, with products, processes and infrastructure geared to minimum consumption of resources. In all its business areas it focuses on safety, economy and environmental compatibility. In the past year, many Group companies worked on projects with the emphasis on social, ecological and economic sustainability.

Employees by regions compared with previous year



Employees worldwide



41,545 employees

+ 706

Research and development

As a high-technology group, Liebherr aims to make a significant contribution to technological progress in all the relevant industries. With this in mind, the Group invests considerably in research and development: last year, expenditure in this area was in the region of 563 million €, a large proportion of which was allocated to product development. Numerous research projects were initiated or continued with universities, colleges of advanced education and research institutes.

For some years, certain topics have been important across the Group's extensive programme of products and services, for instance enhancing the efficient use of energy, networking, automation and reduced product weight. A project of significance to several divisions was the development of an innovative type of high-strength fibre rope in which the component and crane divisions cooperated with an external partner company. It is planned to use this rope in the future on tower, mobile and crawler cranes and also on the Group's maritime cranes.



Employee in the hydraulic excavator assembly area



Logistics centre in Kirchdorf an der Iller, Germany

Investments

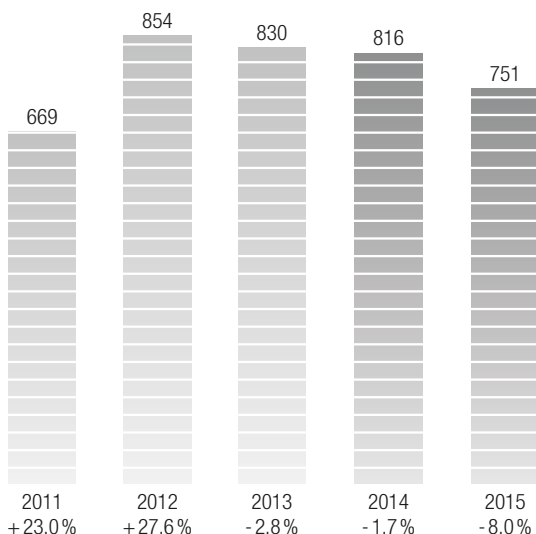
The Liebherr Group has always put emphasis on investing in its production facilities and in the international sales and service network. Last year, investments totalled 751 million € and thus maintained the existing high level. Offset against this figure was depreciation valued at 448 million €.

For several years now, the ongoing expansion of the Liebherr Machines Bulle SA production company in Switzerland has been among the major investment projects. In the spring of 2015, the new logistics centre for spare parts supply of several divisions was opened in Kirchdorf an der Iller, Germany. The Group also continued its expansion of Liebherr-Aerospace Lindenberg GmbH, Germany.

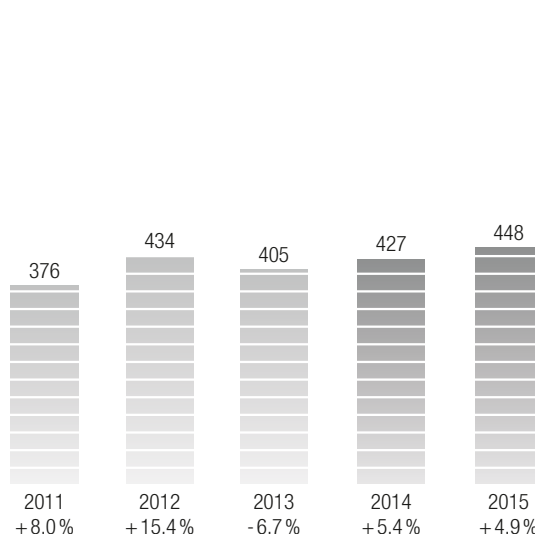
Liebherr invested in sales and service in all its sales regions. Liebherr-Australia Pty. Ltd. completed its extension project in Adelaide, and its new branch in Auckland, New Zealand, went into operation. The Canadian Liebherr company extended its premises in Burlington and opened a mining component remanufacturing centre in Acheson. Sales activities in Switzerland were strengthened by expanding the branch in Daillens. Liebherr opened new after-sales service centres in Durban (South Africa), in the Russian Kuzbass region and in Bogotá (Colombia), amongst others.

A reorganisational measure took place in early 2016: Liebherr USA, Co. was opened as a new sales and service company. Its aim is grouping together the sales activities of eight Liebherr Group divisions in the USA: earthmoving, mining, mobile cranes, tower cranes, concrete technology, maritime cranes, domestic appliances and components. Liebherr USA, Co. will take over the activities of five existing companies.

Investments m €



Depreciation m €



Risk management and internal monitoring systems

To ensure the consistent success of the Liebherr Group, opportunities and risks are identified, evaluated and monitored at an early stage.

Liebherr complies with operative, market-related and statutory requirements in this respect with the aid of a risk management system at Group level and an internal monitoring system that is continually optimised by systematic improvement processes.

For the complete recording, analysis and evaluation of risks, all executives with this responsibility are included in the individual Group companies' risk management and internal monitoring systems. Risks are identified and assessed decentrally in the various companies, whilst counter-measures to limit their effects are initiated, and the consequences are evaluated.

This decentralised approach also makes it possible to identify and assess opportunity areas efficiently. Information on market-related and technological developments is included in opportunity management as a decision factor when determining future business activity areas and production processes.

At Group level, the current risk situation is examined regularly, and the efficacy of the systems and processes currently employed is evaluated.

The internal auditing department confirms that Group directives are complied with and risk management and internal monitoring systems are implemented.

As a family-run business, Liebherr places great importance on behaving with integrity. Above all, this includes the expectation that employees behave in a manner compliant with the applicable legislation, and furthermore also observe internal standards and adhere to a code of conduct. The Group understands the term compliance to entail not only combating corruption but also, in particular, adherence to the rules in relation to competition law and foreign trade law.

Supplementary report

Events of special importance that occur after the annual accounts have been closed, and their effects on the asset, financial and earnings situation, must be described. The Liebherr Group encountered no such events following conclusion of the 2015 business year.

Outlook

The 2016 Business Year

Global economic development in the current year will probably be similar to 2015 with approximately the same rate of growth as in the previous year in both industrial countries and emerging markets. The Liebherr Group expects its turnover to reach the previous year's level.



Liebherr cranes at work in Paris, France

For 2016, the International Monetary Fund once again anticipates stable international economic growth, probably of 3.4% globally with an increase of 2.1% in the industrial nations and 4.3% in the emerging and developing markets. The German economy is expected to develop rather more satisfactorily than in 2015, at a forecast rate of 1.7%. However, the emerging markets in particular could again be adversely affected by slower business activity in China.

According to the World Trade Organisation, there will be a 3.9% increase in the volume of worldwide trade in the current year, and worldwide production is estimated to grow moderately.

In many European countries, there will again be more construction industry activity this year. In the USA as well, the building trade is estimated to develop positively, though with a lower rate of growth than in the previous two years. In the extraction industry however, with its dependence on commodity prices, a worldwide recovery is still not expected in 2016.

Growth in international air freight had already slackened in 2015, and this trend is expected to continue. On the other hand, according to information supplied by the International Air Transport Association, international air passenger volume will increase.

Opportunities and risks

Individual opportunities and risks are summarised into those of similar character, and those relevant to the development of Group divisions are described in the corresponding chapters.

Global economic opportunities are in particular likely to arise from positive indications of US economic growth. Geopolitical uncertainties in the Middle East, those of an economic nature in Russia, and also persistently low commodity prices could give rise to risks.

Risks affecting the Liebherr Group's performance could necessitate specific changes in cost due to volatile commodity prices that cannot be passed on as index-linked contractual price indices.

In the operative business area, market price risks may arise in particular from exchange and interest rate fluctuations. Liebherr continually monitors these risks and protects selected transactions by means of suitable financial instruments. The Liebherr Group only undertakes financial transactions associated with its operative business activity and for hedging purposes. In no circumstances does it engage in transactions with a speculative background.

Global alignment of business activities, broad product diversification and the risk management system anchored at Group level together ensure that the relevant risks can be managed successfully. Based on information currently available, no further risks can be identified that in the 2016 business year could significantly affect the asset, financial or earnings situation and threaten the survival of the Group as a whole.

Forecast for the Liebherr Group

In the current year, the Liebherr Group expects the turnover to be at the previous year's level. The construction machinery and mining area should continue to develop at the previous year's level; other areas are expected to make a positive overall contribution to turnover. Growth can be expected from the earthmoving, tower cranes and concrete technology divisions as well as from the aerospace and transportation systems, machine tools and automation systems and domestic appliances divisions. A definite increase is also anticipated from the Group's other products and services, which includes drive and control technology components and hotels.

The Liebherr Group will continue to invest considerably in its international production sites and its sales and service network. There will again be a slight increase in the numbers of employees at the Group's companies.

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Earthmoving

In 2015 the earthmoving division recorded a turnover of 2,088 million €, an increase of 168 million € or 8.8% compared with the previous year's figure.

Within the earthmoving business sector, there was clearly negative development on all the major sales markets. The overall numbers of machines delivered dropped significantly, with Germany and the USA as the sole exceptions. Business volume in the material handling business sector was further decreasing.

There was an upturn in the division's turnover in Western Europe, reaching a highly dynamic level in Germany and the Netherlands in particular. In Turkey, the turnover developed positively as well. In America and in the Far East and Australia region, Liebherr recorded significant success. Within these regions, the business year was especially successful in the USA and Canada, as well as in some Southeast Asian countries and Australia.

These increases in turnover contrasted with decreases in Eastern Europe and Africa, and also in the Near and Middle East.

Liebherr recorded distinct growth in the duty-cycle crawler crane, material handling machinery, crawler tractor and wheel loader areas. Sales revenue from crawler excavators remained at the previous year's level, while wheeled excavators underwent a downward trend. Increased sales revenue was also achieved in the spare parts and service area.

A major contract was the delivery of 51 Type HS 825 HD duty-cycle crawler cranes to a Turkish customer. The first two Type HS 8300 HD 300-tonne duty-cycle crawler cranes were shipped to Italy and Mexico during the same period.



Development priorities included projects in driveline technology, work-cycle automation and driver and service assistance system areas. The division also examined questions relating to autonomous machines and digitised construction sites. Modular machine concepts are to be drawn up for all product lines. Furthermore, Liebherr continued development work on modular control systems.

Among the principal product development activities were the introduction of machines complying with level IV exhaust emissions and the validation of new machines for emerging markets. Parallel to this, development work began on machines that comply with level V exhaust emission limits.

In the crawler excavator area, Liebherr continued development work on a hydraulic hybrid machine, and on a new hydraulic system for excavators with a service weight above 40 tonnes. Last year, the division began work on a new concept for the crawler excavator programme with service weights between 20 and 40 tonnes. The production company in Telfs, Austria, enlarged its telescopic loader programme. Further priorities were the ongoing development of Generation 6 crawler tractors and loaders complying with level IV exhaust emission limits, and drawing up options for specific markets. Generation 6 model development also began in the pipelaying product area. The new XPower large wheel loaders with level IV exhaust emission compliance were a milestone in the technical history of Liebherr's wheel loaders. XPower is an innovative, integral machine concept for Types L 550 to L 586. Its power-split travel gear is a standard feature. A new material handling machine is the LH 110 C High Rise Port.

In April 2015, Liebherr-Werk Nenzing GmbH, Austria, announced the new HS 8130 HD hydraulic duty-cycle crawler crane for special deep-foundation and material handling work with further improvements to the hydraulics compared with previous models. In the same month, the company introduced the new LRB 355 piling and drilling rig, developed specifically for full-displacement drilling. An important development in the deep-foundation area was the LV 20 hydraulic vibrator.

In April 2015 too, Liebherr opened a logistics centre for earthmoving machine parts in Kirchdorf an der Iller, Germany. Liebherr-France SAS built a new service facility in Pons and in 2016 the company will establish a further sales and service subsidiary in Rognac, Southern France. In Bischofs-hofen in Austria, Liebherr enlarged its production capacity and its rental equipment fleet.

A cooperation between Liebherr-Werk Telfs GmbH and the Claas Group was announced in June 2015. There are plans to develop, manufacture and supply telescopic-boom loaders. Series production of these machines is scheduled to start in 2018. This cooperation will give Liebherr access to sales potential in agriculture.

For 2016 the division expects its turnover to rise slightly despite a difficult business climate.

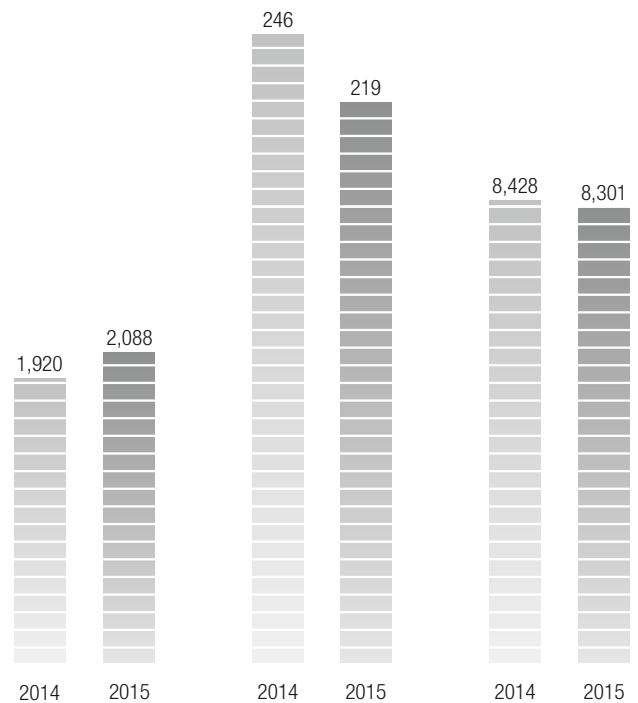
Turnover by sales regions



Turnover
+ 8.8 %
m €

Investments
- 11.0 %
m €

Employees
- 1.5 %





Mining

The crisis in the worldwide extraction industries continued in the past year. With this as a backdrop, the mining division recorded a turnover of 725 million €, a slight decrease of 10 million € or 1.4%.

In 2015 it once again proved impossible to halt the highly negative trend that has prevailed in the worldwide mining industry since 2013. There was a further noticeable reduction in the number of machines delivered. In total, the proportion of large dumper truck deliveries was distinctly higher than that accounted for by large hydraulic excavators. In 2015 as before, investments were again postponed, and many companies in this business sector undertook cost-saving measures. Enormous overcapacity in the extraction area caused severe competition on price: the collapse of prices obtainable for coal, copper and oil continued.

In Africa, Liebherr enjoyed a positive business year. Growth resulted in particular from sales of mining excavators in South Africa. In Far East/Australia on the other hand, the division's most important sales region, turnover dropped again. In Eastern Europe and on the American continent as well, sales revenue was slightly below the previous year's figure.

Overall demand last year was mainly centred on the smaller excavator product lines. Fewer orders were received for the larger models. Mining truck orders were primarily for the T 282 C, Liebherr's largest model in this product area. The division's turnover in the spare parts and service area developed positively.



A notable anniversary last year was the twentieth year of large dumper truck production: mining trucks have been built in Newport News, VA/USA, since 1995. Another recent milestone was the delivery of the hundredth Type T 282 C to Australia as part of a new customer's major order for 14 of these trucks.

The new R 9200 large hydraulic excavator, with an engine rated at 810 kW, began testing in South Africa and Indonesia early in 2015. Following very good results from these tests, approval for the sale of pre-series models was granted in 2015.

Another new model is the PR 776 crawler tractor for mining and extraction purposes. In Telfs, Austria, this model is developed and built. It is the company's first crawler-track model in the 70-tonne class. A special feature for a machine in this class is its continuously variable hydrostatic travel drive, as fitted to all of Liebherr's crawler tractors.

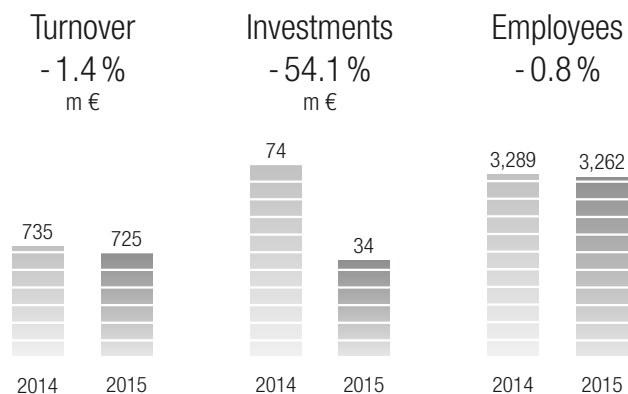
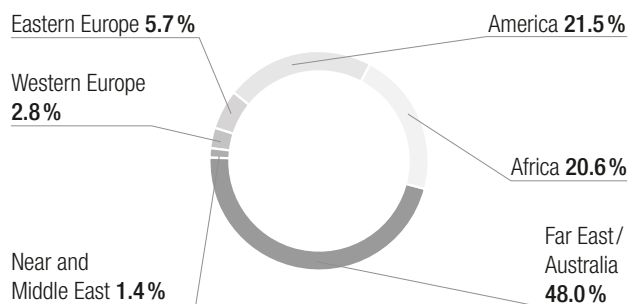
One of the principal research and development activities concerned components and technologies for automated dumper truck driving motions. The first motions of this kind were undertaken last year. The division also undertook development projects on energy management, the efficient use of energy, machine monitoring and diagnosis, driver assistance systems and partial automation, and the use of new weight-saving materials. A further priority was the integration of the Liebherr D98 series of diesel engines. In the product development area, Liebherr Mining Equipment Newport News Co. worked on a new dumper truck in the 290- to 300-tonne class, and Liebherr-Mining Equipment Colmar SAS worked on the development of dumper trucks with smaller payloads.

A centre for reconditioning mining components was opened by Liebherr-Canada Ltd. in Acheson, Canada. In Colmar, France, the mining excavator production company commissioned a prototype vehicle testing ground with a site area of 8,000 m². The Australian sales and service company, which is based in Adelaide, received certification in accordance with the ISO 9001 quality management standard.

In the current year, the downturn in the worldwide extraction industries is expected to persist and the level of investment will to therefore drop further still. Despite this, Liebherr estimates that its mining division will match the previous year's turnover. A positive feature is an increasing demand for smaller mining excavators in the 100- to 200-tonne class, in which Liebherr supplies three models, the R 9100, R 9150 and R 9200. Existing and new products and services are also expected to boost turnover in the after-sales and service area.

The R 9200 and the PR 776 were shown to the public for the first time in the spring of 2016. The division will also exhibit new machines at the "Minexpo" trade fair to be held in Las Vegas, NV/USA, in September 2016, including the new midsize dumper truck.

Turnover by sales regions





Mobile Cranes

In 2015 Liebherr's turnover from mobile and crawler cranes was 2,159 million €. Despite the absence of upward movement in the mobile cranes market, the division's turnover rose by 167 million € or 8.4%.

Development on the world market for mobile cranes was at the same level in 2015 as in the previous year. Liebherr mobile cranes were primarily in demand for projects in the energy sector, the petrochemical industry and for infrastructural work.

In the Far East region, the division's business year was extremely satisfactory, with significant increases in turnover especially in Asia. Sales revenues from the Near and Middle East rose too.

In Western Europe, the division's turnover developed positively, with especially positive results in Great Britain, Germany and the Netherlands. Turnover in America was slightly below the previous year's figure. In Canada, in particular, there was a drop in turnover. Sales revenue from Russia declined noticeably.

Sales of used Liebherr cranes reached a distinctly higher volume compared to the previous year. Demand for new machines was also stronger, and turnover from spare parts also grew slightly.



The world market for telescopic and lattice boom cranes stagnated in 2015. This was reflected in the division's order situation. The strongest demand for all-terrain cranes was in the four- and five-axle categories.

The division's share of the world market for all-terrain cranes was above 50% and Liebherr was one of the three highest-volume manufacturers of lattice boom crawler cranes.

The LTC 1050-3.1 and updated LR 1750 cranes reached the market. At the Customer Days in Ehingen, Germany, the 250-tonne LTM 1250-5.1, the most powerful five-axle mobile crane on the market, and the LR 1500 crawler crane were presented for the first time. The LR 1500 can lift loads in the 500-tonne crawler crane class over its entire working range, yet its dimensions and component weights are what would previously have been expected in the 400-tonne class. Priorities during the development of this crane were easy operation in all work areas and economy. A new eight-axle crane is ready for its market launch.

Among the crawler cranes with a load capacity up to 300 tonnes, the LR 1100 was an important new model. This crane, in the 100-tonne class, has a new steel structure, a swing ballast option and a 230-kW Liebherr diesel engine that complies with Level IV/Tier 4f exhaust emission limits.

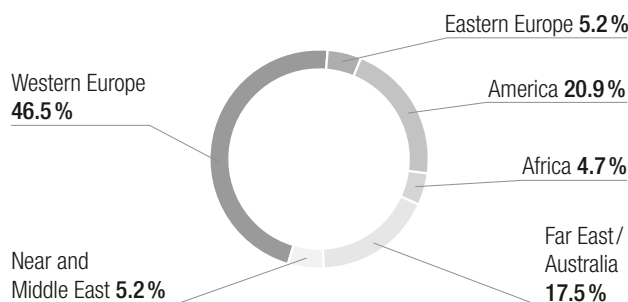
Last year, the division again enlarged its product programme. An important step forward, applicable to many crane types, was compliance with Level IV/Tier 4f exhaust emission limits of diesel engines. Work also continued on software for planning the use of machines on construction sites. The development department examined the basic functions needed to display the site environment as a graphic user interface. Parallel to this, a technological analysis for simulation software was undertaken with cloud distribution and the recording of actual environmental data as its topics. Liebherr announced two new operator assistance systems, the "Vertical Line Finder" and the "Horizontal Load Path". These systems make the crane operator's work easier.

Liebherr-Werk Nenzing GmbH cooperated with Dresden University of Technology on the development of a hydraulic cylinder made from carbon-fiber-reinforced plastic, and with the Group's earthmoving division on a new control-system computer.

Liebherr's investments in Ehingen, Germany, and Nenzing, Austria, were primarily in machines and plant. To further improve the support offered to mobile and crawler crane customers in South America, Liebherr Colombia SAS opened a new sales and service branch in Bogotá, Colombia, in April 2015; it also oversees the market in neighbouring Ecuador.

In 2016 the division's turnover is expected to be almost equal to the previous year's figure.

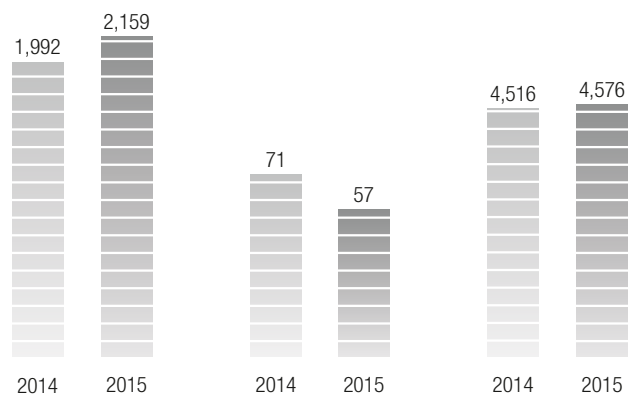
Turnover by sales regions

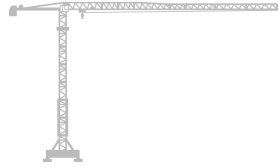


Turnover
+ 8.4 %
m €

Investments
- 19.7 %
m €

Employees
+ 1.3 %





Tower Cranes

The tower cranes division recorded a gratifying increase in turnover of 26 million € or 6.3% to a total of 440 million € for the 2015 business year.

Notable overall features of the world tower cranes market in the past year were greater price awareness and increased competitive pressure. Some European competitors increasingly introduced cranes built in emerging markets to the European market.

The division's turnover rose in Western Europe: there was an upward trend in sales revenue in the Netherlands, Belgium and Switzerland in particular. Although turnover went down in Germany, there was a very dynamic development in Turkey. The division's turnover from the American continent went up, and in the USA in particular, the business year was most successful. The highest growth rates in the Near and Middle East were recorded in the United Arab Emirates and

in Qatar. In the Far East and Australia region, the division achieved high rates of growth in Thailand, and was therefore able to record an increase in total turnover. Sales revenue was distinctly lower in Eastern Europe and in Africa.

Deliveries of top-slewing cranes and mobile construction cranes were both higher than in the previous year, however fewer bottom-slewing cranes were delivered.

In May 2015, the division secured its largest individual order to date for no fewer than 58 tower cranes to work on the new airport in Istanbul, Turkey. Another significant order was placed with the division in connection with the new Lakhta Tower in St. Petersburg, Russia, which at 462 m will



be the highest building in Europe. For construction work on this building the division supplied four luffing cranes, together with six top-slewing cranes to be used at the base of the tower on the building.

Liebherr was also granted an order by a customer in Azerbaijan for four luffing cranes for a tower building complex in Baku.

The division's research and development work was devoted to a number of projects: the production company in Pamplona, Spain, developed a new tower system and also a crane intended for the Indian market. The Indian production company began to build a prototype of this crane early in 2016.

Among the innovations in the bottom-slewing crane area was the L1-24, the first model in a new series of hydraulic construction cranes, and one notable for easy assembly. Series production commenced early in 2016 and the crane was exhibited to the public for the first time in March.

Liebherr built the first examples of the Liebherr 150 EC-B 8r top-slewing crane at its Russian production company. Also in 2015, the first Type MK 140 mobile construction cranes were delivered to customers in Switzerland, England, France and Germany.

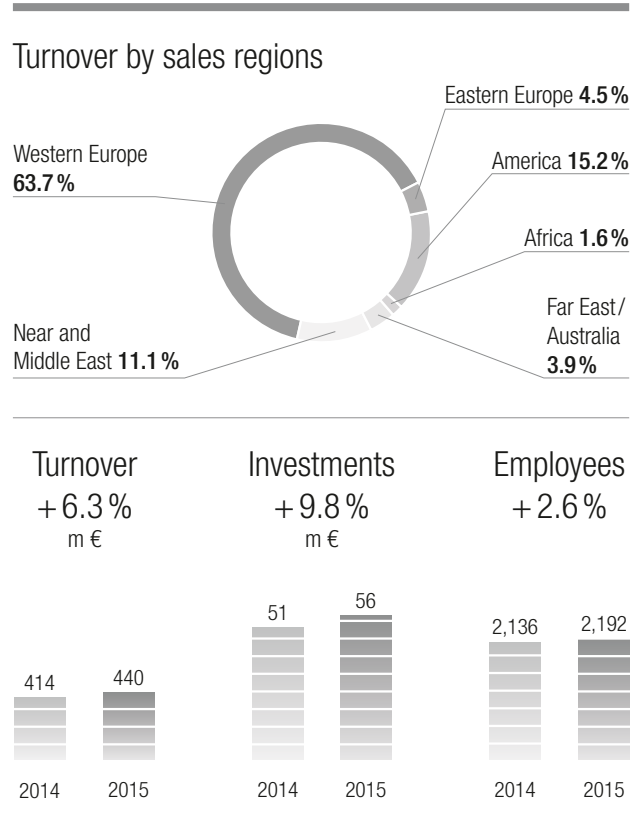
For the 357 HC-L 12/24 and 542 HC-L 18/36 luffing cranes, the division developed a 160-kW driveline that increases speed by 25% when there is no load on the hook. The 710 HC-L was extremely well received by the market. As an option this crane has a second hook that can be used to turn the load.

At the 2015 "Intermat" trade fair in Paris, France, Liebherr exhibited a new development, the LiUP 200 crane driver elevator. The lift system is powered by a lithium-ion battery. Since the LiUP is located inside the tower, it has definite advantages when being assembled and dismantled compared with competitors' products.

At the end of 2015, the division added a small dismantling crane to its product programme. It provides the customer with a straightforward, safe means of removing the building struts used with Liebherr top-slewing cranes. Of modular-element design, it consists of the dismantling device and a specific type of support arm for the tower in question.

The division undertook various investments during 2015, especially in Biberach an der Riss, Germany. In summer, work began on replacing the existing painting equipment for large items with a highly automated powder-coating plant for large structural steelwork elements. In addition, the division expanded its fleet of equipment for hire, especially in France and South Germany. There was also further investment in machinery and in the plant in Pamplona.

In 2016 the division expects its turnover to increase again, due, among other factors, to the introduction of new products and technologies to the market. These include the new L1 crane series. In the current year, the division will again pursue its activities in a business climate notable for severe competition and pressure on prices.





Concrete Technology

Last year, Liebherr's turnover from truck mixers, concrete mixing plants and concrete pumps was 212 million €, a drop of 21 million € or 9.0%.

Manufacturers of construction materials worldwide expected turnover in 2015 to reach the previous year's level. Demand in the form of new infrastructure projects in this business area was absent, and both customers and manufacturers were exposed to competition in pricing. The German Ready-Mixed Concrete Association registered a slight drop in turnover.

Liebherr's individual product areas developed in very different ways. Revenue from concrete mixing plants was distinctly lower, but turnover from truck mixers rose slightly and there was a noticeable increase in the contribution to turnover made by concrete pumps.

In Western Europe, the division's turnover was slightly higher than in the previous year, with increases in the concrete mixing plant and concrete pump areas. Reduced demand for truck mixers was evident, however, especially on the French market.

The business year progressed well in the Near and Middle East, and Liebherr was able to record strong growth in the United Arab Emirates and Kuwait in particular. Sales revenue in the Far East remained at approximately the same level as that of the previous year. Higher turnover was achieved on the African continent, mainly due to increases in Egypt and South Africa. In America and Eastern Europe, on the other



hand, turnover decreased noticeably. This was caused by reduced business volume in Brazil and Russia, countries suffering from economic recession.

In 2015 lightweight truck mixers continued to gain in importance in Central Europe. Ultra-light versions with weight-optimised chassis have only played a relatively minor role in the market until now.

Among the major projects undertaken was the development of a new truck mixer. The emphasis was on optimised functions for easy operation of the controls and safety of the operating personnel. Further, there was a project on the reduction of weight for a new generation of truck mixers. Comprehensive customer analysis was undertaken for the development of the new truck mixer generation.

A special innovation was presented for the first time in early 2016: a truck mixer featuring a novel, versatile platform concept for the installation of attachments such as tool boxes, and also the new LICRO 500 grade of steel for the mixer drum. Development also went ahead on a ring-pan mixer for various special grades of concrete with continuously variable mixing and agitator speeds.

The conveyor belt product family has established itself extremely well on the market over the past ten years. Unique sales features are the drive layout with two ball slewing rings and the supports, which are similar to those used on the mobile cranes.

In the mobile mixing plant area, changing market demand was catered for with the folding Mobilmix concept. It has a twin-shaft mixer holding 2.5 m³. New horizontal mixing plant concepts were developed for various growth markets.

A vibration damping concept for the concrete pumps was assessed. Its feasibility for mechanical and hydraulic elements and its integration into the control concept were explored.

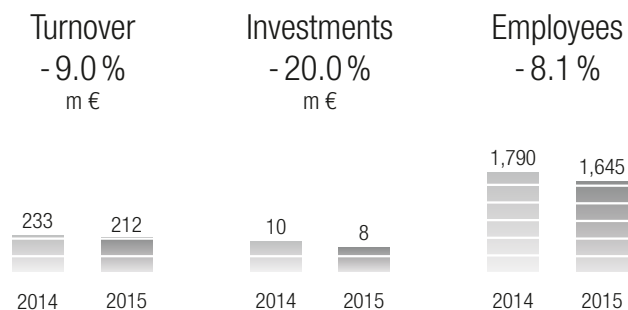
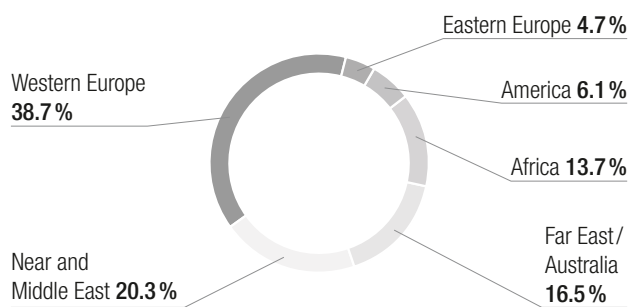
In the measurement technology and control system areas, the LWS3 measuring amplifier reached series production readiness after extensive field testing, which continued around the clock for a period of ten months and has yielded a highly stable, reliable device.

Another major innovation was the development of a digital streaming sensor, which permits plant and machinery manufacturers to integrate measured values directly into their control systems. This sensor is already being used in the animal food industry and on plot combine harvesters in the seed cultivation area.

The division's main investments were in machines and plants. Liebherr expanded its truck mixer production in Saudi Arabia. Since 2016 the division has been represented in Bulgaria by the Alki-L dealership, which has been performing this function for other Liebherr divisions for some time.

The introduction of new products and a recovery in demand for concrete mixing plants enables a forecast of a distinct increase in the division's 2016 turnover. Risks may arise from a more severe competition.

Turnover by sales regions





Maritime Cranes

Following a most welcome increase in 2014, the maritime cranes division recorded a turnover at approximately the same level in 2015. Sales revenue totalled 964 million €, a slight drop of 24 million € or 2.4%.

The division achieved distinct growth in Eastern Europe, an area in which, in contrast to the general pattern of economic development, Russia proved to be an especially dynamic market. In the Far East/Australian region, on the other hand, sales revenue did not reach the previous year's total. The business year as a whole was very satisfactory on the American continent: turnover grew strongly in the USA and Chile but was lower in Brazil and Canada.

In Western Europe, turnover was slightly above the previous year's figure. Considerably more business was obtained with mobile harbour cranes, especially in the Netherlands, Spain and Great Britain. In Africa, overall turnover decreased.

Liebherr was able to maintain its clear position as world market leader despite a drop in turnover from mobile harbour cranes. In the classic ship crane area, excess fleet capacity continued to depress demand to a below-average level. Results from the strongly contended heavy-duty ship crane area were rather more gratifying, with some individual high-volume orders being received. In the market segment for ship-to-shore container cranes, a trend toward more powerful cranes with longer booms and greater lifting heights was recorded. Liebherr secured large-volume orders and therefore succeeded in maintaining its satisfactory market position.



Sales of floating and portal cranes remained weak on the important Indian and Indonesian markets in 2015. The continual drop in the price of oil had an adverse effect on the offshore crane category, with some major projects being postponed indefinitely. Nonetheless, the thousandth Liebherr offshore crane, a Type RL-K 4200 subsea crane, was ordered in the summer of 2015.

New customers were secured in the various product areas last year and new markets accessed. For example, the first ship-to-shore container cranes were supplied to Mexico, India and Puerto Rico.

In 2015 the division introduced a number of new products. They included the LHM 800, an addition to the top end of the mobile harbour crane programme, with which Liebherr is able to offer a crane providing exceptionally high performance for heavy loads and able to handle containers from Super-Post Panamax ships. The first LHM 800, with a load capacity of 308 tonnes, was delivered in September 2015 from Rostock, Germany, to St. Petersburg, Russia, in fully assembled form.

At the "TOC Europe" in Rotterdam, Netherlands, the most important maritime trade fair, the LRS 545 reachstacker was exhibited for the first time. Powered by a 270-kW diesel engine, this freight handling machine can stack up to five high containers in the first row, and lift up to 45 tonnes. Pre-series versions were built toward the end of 2015 and made available to selected customers for testing. Deliveries of the first serial reachstackers, some with a hybrid driveline option, will start in mid-2016.

A significant order was received from Sydney, Australia, for three container cranes with articulated booms to customer's special order. They have an outreach of 57 m and a lifting height of 45 m, and among other innovations, feature an anti-swing system that makes automatic loading cycles possible. A ship-to-shore container crane with articulated boom, used at Sydney harbour for the first time, enables this large crane to operate near the airport, where height restrictions apply. The crane has also been prepared for optional automation of the load handling cycle.

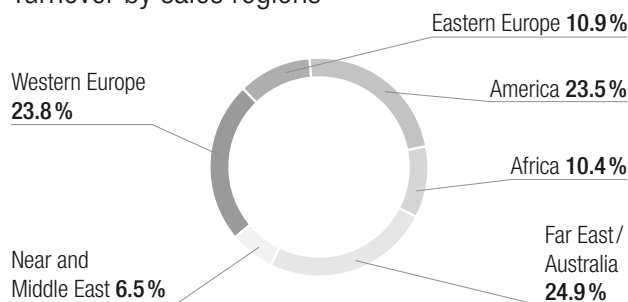
For container handling gantries and stacking cranes, Liebherr has developed a new-generation all-electric driveline using liquid-cooled frequency converters. Intended specifically for the crane industry, it is strongly built and versatile. Its modular-element design minimises maintenance and spare part costs and results in higher crane availability.

Investments were mainly allocated to Rostock, Germany, and Killarney, Ireland: at both these locations there was increased investment in production areas. In addition, construction of a dispatch building began at the port of Fenit, Ireland.

Within the division, there was a major organisational change: activities in the maritime product area were moved from Nenzing, Austria, to Rostock. A further milestone was reached in January 2016, when the main sales and design work was transferred to Rostock.

In the current year, the ship crane area is expected to continue its moderate growth, this being determined by continued over-capacity on the world's sea routes. In view of the low price of oil, a noticeable revival of the offshore market is to be anticipated only in the medium term. Liebherr expects turnover from dockside handling machines to reach a similar level to the previous business year.

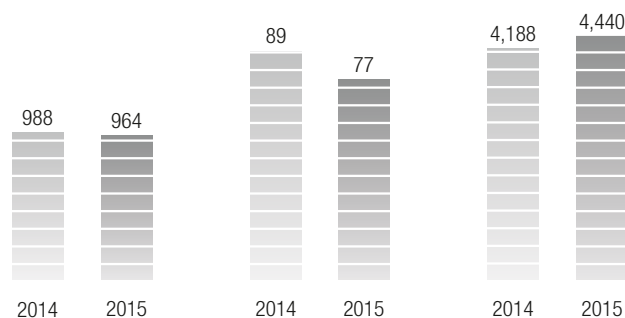
Turnover by sales regions



Turnover
- 2.4%
m €

Investments
- 13.5%
m €

Employees
+ 6.0%





Aerospace and Transportation Systems

In 2015 the aerospace and transportation systems division increased its turnover by 51 million € or 4.4% to 1,220 million €; sales revenue from both business areas was higher, with slightly more growth from transportation systems than from aerospace.

Demand for international passenger air travel rose in 2015 to the highest level in the past five years. Only very moderate progress, however, was recorded in the air freight area. The global rail industry enjoyed modest growth. Features of this market were over-capacity and strong consolidation tendencies.

In addition to other important items of equipment for the Boeing 777X, Liebherr received an order to develop and supply components of the fold subsystem for the new Boeing wide-bodied aircraft. This system folds up the wing-tips after the aircraft has landed, and in this way reduces the wingspan of the B777X by 7 m – 3.5 m on each side.

A milestone reached during the business year was the maiden flight of the CS300 regional jet airliner. Liebherr supplies the landing gear and integrated air management systems for this aircraft, which is the largest in the Bombardier CSeries. The COMAC C919 had its first public rollout; it uses Liebherr landing gear and an integrated Liebherr air management system. Another notable rollout concerned the Embraer 190-E2, the first aircraft in that company's new E-Jet E2 family. Liebherr developed and supplies the high-lift device and air management systems for these regional aircraft from Brazil.



© Boeing

A further milestone was passed when the Airbus A350 entered service with several airlines. For this most recent member of the Airbus family, Liebherr has developed various important components, including the nose landing gear and the front slat actuation mechanism. As in all other programmes, the company provides comprehensive OEM after-sales service based in its worldwide network, comprising repair and maintenance services, technical support, documentation and spare parts.

The division supplies air management systems for the AC312 series of helicopters built by the Chinese manufacturer Hafei-Harbin.

In the transportation systems area, Deutsche Bahn (German Rail) placed an order with Liebherr in 2014 for a multiple unit from the first build of its ICE 3 fleet to be equipped with an air cycle air conditioning system. This system's trial phase was completed in 2015. In this regard, the division undertook a public transport vehicle air conditioning project on behalf of the Federal German Ministry for the Environment with the aim of analysing the extent to which such systems are competitive compared with those of conventional design. In addition, a demonstration air cycle air conditioning system is being tested in an SNCF (French Rail) regional train.

Bombardier Transportation commissioned Liebherr to supply nine cooling systems for the lithium-ion batteries intended for use in the Primove® electric bus. Further, Liebherr received two orders from China for tram anti-buckling systems.

In the service area, Liebherr also obtained numerous orders from rail vehicle manufacturers, including one for the development and supply of equipment for the British Thameslink passenger-vehicle rail fleet. For a Czech operator, Liebherr is to overhaul numerous split air conditioning units in mainline passenger-train vehicles. The local passenger transport operator in Montpellier, France, has commissioned Liebherr to supply spare parts and also complete new control systems in connection with the planned overhaul of its vehicle fleet's air conditioning systems.

Liebherr's extensions to the Lindenberg, Germany, location continued according to schedule. There were investments in machines and plants in Toulouse (France), Korneuburg (Austria), Saline (MI/USA) and Guaratinguetá (Brazil).

A significant achievement last year was the establishment of a 50:50 joint venture by Liebherr-Aerospace Lindenberg GmbH and Rolls-Royce with the aim of developing competence and capacity for the production of power gear drive trains for the Rolls-Royce UltraFan™ engine. This is a new product area for Liebherr's aerospace business.

The division expects to increase its turnover in the current year. Liebherr will continue to benefit from the prevailing high demand for aircraft that can be operated as economically as possible. The positive trend worldwide in the rail travel business sector is also expected to continue.

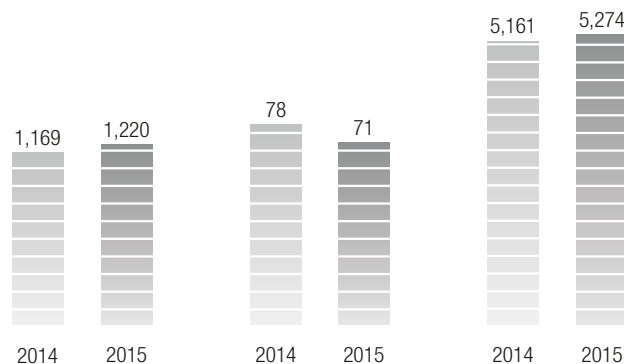
Turnover by sales regions

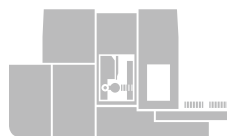


Turnover
+ 4.4 %
m €

Investments
- 9.0 %
m €

Employees
+ 2.2 %





Machine Tools and Automation Systems

The machine tools and automation systems division made substantial progress in the past business year: turnover rose by 35 million € or 16.9% to 242 million €.

In 2015 the German machine tool industry received orders slightly above the previous year's level. According to the Association of German Machine Tool Manufacturers (VDW), orders both from the domestic market and those from other countries rose by 3%. In the USA, orders were significantly below the 2014 level.

Liebherr's turnover from machine tools, and in particular from automation systems, rose significantly. Tool business maintained the same level as in the previous year.

The division's turnover dropped in Western Europe, with a marked reduction in Great Britain and Germany, but a significant increase in Sweden. The business year progressed positively in Eastern Europe, in America and above all in the Far East and Australia region. Exceptionally strong growth, primarily obtained from the automation systems product area, was recorded in China. Growth rates were also very high in South Korea and India.



Further options were made available last year for the LGG 180/280 gear grinding machine introduced in 2014. They included new grinding heads in response to ongoing market demand, and the 'clean factory' option for drip-free work-piece production. In the machine control area, the division prepared the LHGe@rTec gear milling operator's interface for introduction in the current year.

The product highlight in the automation systems area was the new PHS 10000 heavy-duty pallet handling system. It can move workpieces weighing up to 16,000 kg under process control from the pallet store to the machining point and back. In this way, automated production without personnel or extended production shifts becomes possible even for large, heavy workpieces.

At the 2015 "EMO" trade fair in Milan, Italy, the division received a major order for 22 gear shaping machines from the South Korean DIC DAE-IL Corporation. Most of the machines will be operated by its Chinese subsidiary company.

The division's product development work was mainly devoted to further development of a gear shaping process for the aerospace industry.

Important options for the LGG gear grinding machine programme were also completed and a further priority was a gear milling machine with reduced entry-level cost; this is to have its market launch in 2016.

In the automation area, Liebherr added the LP 100 version to its loading gantry product range. To satisfy customer requirements in the light-duty area – i.e. in the automobile industry – the loading gantry can represent a lower-cost automation application. The bin picking automation system is used to pick up parts arranged at random in the transport bins. In co-operation with the Fraunhofer Institute, the user-friendliness of the system's operating interface was further enhanced.

Last year the division's investment was primarily devoted to machining centres automated by a heavy-duty pallet handling system developed in-house. The production area also received a new grinding machine and a new trimming press.

The division extended its sales channels successively in all product areas. In the spring of 2015, Liebherr concluded an agreement for local representation of its gear shaping machines on the Mexican market. A new joint venture in South Korea began in April 2016. From the second quarter of the year onward it enables the division to offer industrial services in the gear shaping area directly on the local market.

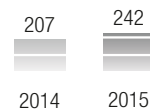
In Japan, the automotive industry has become a promising market for gear shaping machines. Therefore, Liebherr Japan Co. Ltd. is going to open a sales and service office for the division's products in 2016. For gear shaping tools, it there are plans to explore new potential in North America and China by means of partnerships with leading toolmaking companies.

For 2016 the German machine tool industry expects only a slight increase, whereas the outlook for the US market is more positive. For the current business year, the division expects turnover to reach the previous year's level.

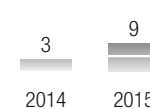
Turnover by sales regions



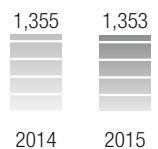
Turnover
+ 16.9 %
m €



Investments
+ 200.0 %
m €



Employees
- 0.1 %





Domestic Appliances

The domestic appliances division's turnover in 2015 was 920 million €, 5 million € or 0.5% above the previous year's figure.

In 2015 the worldwide market for large electrical appliances grew slightly in terms of sales volume; this was also evident in the refrigerator and freezer area. There were definite variations between the regions in Europe. While development was vigorous in Germany and France, the largest markets, there was a severe downturn in some Eastern European countries.

Progress in the division's two most important regions, Western and Eastern Europe, also varied considerably. Sales revenue rose in Western Europe compared with the previous year, especially in Great Britain, Switzerland and the Netherlands. In Eastern Europe, on the other hand, the division suffered a drop in sales revenue that was mainly due to lower demand in Russia. Turnover in Africa and the Near and Mid-

dle East rose. Sales revenue also increased in the USA and Australia; in Asia, it reached the previous year's figure.

In 2015 the division's research and development department placed the emphasis of its work on systematically reducing the appliances' energy consumption and noise emissions.

The "BluPerformance" model line was a highlight in the division's product development; an entirely new generation of standalone appliances with which Liebherr is setting new standards of economy, sustainability and design. Thanks to innovative cooling technology, all BluPerformance models are notable for their high environmental acceptability and comply with the highest A+++ category for efficient use of energy. Some models are in fact a further 20% more



economical than the previously highest rated models. In addition, the refrigerators and freezers are very quiet, with more space available for food storage since the compact refrigerating technology is integrated into the plinth. As an option the new generation of standalone models can be connected by WLAN to “Smart Homes”, and controlled conveniently via Internet. Using the SmartDeviceBox as an accessory, additional functions can also be used: temperature, SuperCool or SuperFrost can be adjusted, or alarm signals received.

Product development work on the two temperature-controlled wine cabinets for 45 cm wide spaces was focused not only on efficient use of energy but also on timeless, classic design. The two compact temperature-controlled wine cabinets (WKEgw 582 and WKEgb 582) can be integrated most effectively into kitchen furniture schemes without handles. These appliances use the latest in refrigeration technology, comply with energy efficiency class A+ and include every feature for optimal storage of wine at the ideal temperatures.

In the commercial area, Liebherr exhibited two new models of refrigerators and freezers (BKv 5040 and BG 5040) at the “Internorga” trade fair in Hamburg, Germany. These models have been designed specifically for use in bakeries and confectioners, and are notable for the quality of their low-temperature components, ease of operation, strong construction and economy. The GKPv 6573 model with insulating glass door also features LED lighting in the roof with a separate switch. This is possible because LED lighting generates less heat, lasts considerably longer and uses much less electricity than conventional lighting.

The German consumer advisory organisation “Stiftung Warentest” confirmed the outstanding technological quality of three Liebherr appliances and voted them test winners in their respective classes. The GNP 3666 freezer cabinet, the GTP 2356 freezer chest and the IGN 1654 built-in freezer cabinet came in ahead of competitors’ models on account of their temperature stability and efficient use of energy. In addition the IKBP 3550 refrigerator for integrated installation and the UWT 1682 under-worktop wine cabinet received the “Red Dot award” in the “product design” category.

In the past business year, the division particularly invested in tooling for the production of BluPerformance appliances. In spring 2016, the production company in Radinovo, Bulgaria, completed construction of a new logistics centre.

The GfK market research institute expects this business sector to increase its turnover slightly in 2016. Liebherr also anticipates positive growth and good prospects in the domestic appliance area from the new BluPerformance range of standalone models. In the commercial market segment, the recently introduced refrigerator and freezer chests for supermarkets, in particular, have further growth potential.

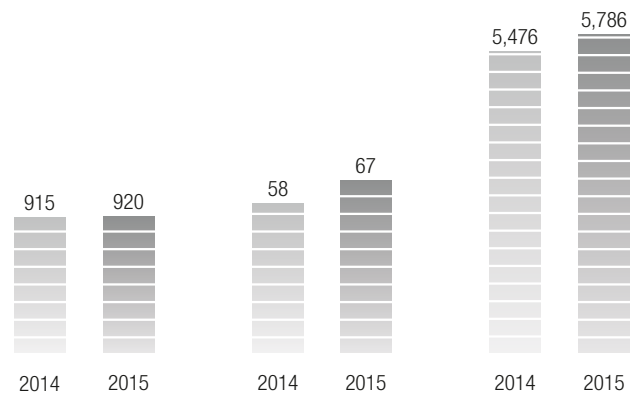
Turnover by sales regions

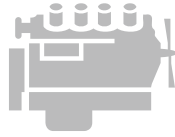


Turnover
+ 0.5 %
m €

Investments
+ 15.5 %
m €

Employees
+ 5.7 %





Components

In the past year, the components division benefited in particular from strong growth of the wind power industry. It also expanded its range of activities in numerous product areas, and extended its production facilities at various locations.

In 2015 Liebherr considerably increased the proportion of components it produced for the wind power industry. In most cases, these were large diameter bearings and drives.

The division also received numerous orders from maritime customers, including one for a segmented roller slewing ring of more than 9,700 mm in diameter and a large order for transmissions to be used on two offshore cranes with a maximum load capacity of 10,000 metre-tonnes.

For the first time, Liebherr exhibited at the “electric&hybrid” trade fair in Amsterdam, Netherlands, and at “SPS IPC drives” in Nuremberg, Germany, where it displayed innovations in control technology and electrical machines. At “SPS

IPC drives” the control technology business area announced a new series of innovative power modules with eight categories covering the range from 110 to 1,100 kW. They can be extended to form a modular frequency converter system. Control systems for Liebherr’s tower and container cranes with optimised safety features were also developed.

The fuel injection systems product programme was extended in 2015 by the second generation of common rail systems. These have a newly designed pump and a continuous rail for inline engines, and there is an additional installed version with pressure infeed from the top.



For its modular engine programme, the division introduced new engine management units and SCRFilter exhaust emission control. With this system, Liebherr is prepared for compliance with the EU Level IV emission directive for diesel engines, valid from 2019 onwards. It is already in use for tunnelling work and in Switzerland.

At the "Agritechnica" trade fair in Hanover, Germany, the axial-piston hydraulics business area exhibited a medium-pressure pump. With a nominal pressure of 280 bar, this pump is ideal as a fan drive or for the power hydraulics on mobile machines. Hydraulic assemblies were also added to the hydraulic components programme. They are initially used for tower crane climbing systems. A research priority in this business segment is the automation of hydraulic applications with the aid of intelligent electronic sensors and actuators.

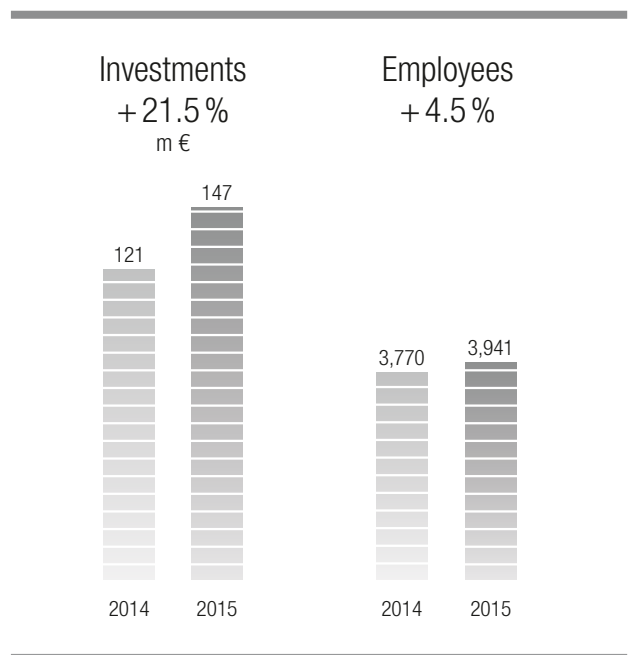
The division invested a total of 147 million € in 2015. In Biberach an der Riss, Germany, Liebherr-Components Biberach GmbH successfully completed construction work on its branch production plant. Liebherr Machines Bulle SA, Switzerland, continued its major investment project. The new logistics centre for the diesel and gas engine production company has now begun operation, and construction work on the extension to the test rigs has been completed.

To meet the demand from international companies in the wind power industry more effectively, construction work began in Brazil on a large diameter bearing manufacturing facility, which is scheduled to start work in mid-2016. In addition to Liebherr-Components Biberach GmbH and Liebherr Monterrey, S. de R.L de C.V. in Mexico, which delivered the ten thousandth large diameter bearing in the summer of 2015, the new facility in Guaratinguetá, Brazil, will be the third in this product area.

The division continued to develop the international character of its remanufacturing (Reman) business area. Equipment for component reconditioning was also installed in Guaratinguetá. The increasing importance of component reconditioning is borne out by an investment project in Germany: at the end of 2015, construction began in Ettlingen on an extension workshop with a floor area of 2,500 m².

In Deggendorf, Germany, in May 2015, a ground-breaking ceremony was held for a production facility dedicated to micro-precision parts and injectors for common rail fuel injection systems. Completion is scheduled for mid-2016. In Kirchdorf an der Iller, Germany, construction work started at the beginning of 2016 on a plant for the assembly, testing and painting of the complete hydraulic cylinder programme.

In 2016 good utilisation of available capacity is expected once again in the wind power equipment components area in particular. Liebherr also anticipates positive progress in the gas engine and hydraulic cylinder areas, as well as increased after-sales service business.



Group Companies

The Group

Summary of Group Companies

Western Europe

Austria

Hotel Löwen Schruns GmbH

Schruns

Interalpen-Hotel Tyrol GmbH

Telfs

Liebherr-Hausgeräte Lienz GmbH

Lienz

Liebherr-International Austria GmbH

Bischofshofen

Liebherr-MCCtec GmbH

Nenzing

Liebherr-Transportation Systems GmbH & Co KG

Korneuburg

Liebherr-Werk Bischofshofen GmbH

Bischofshofen

Liebherr-Werk Nenzing GmbH

Nenzing

Liebherr-Werk Telfs GmbH

Telfs

Denmark

Liebherr-Danmark ApS

Hedensted

Finland

Liebherr-Finland Oy Ab

Helsinki

France

Liebherr-Aerospace Toulouse SAS

Toulouse

Liebherr-Aerospace & Transportation SAS

Toulouse

Liebherr-Components Colmar SAS

Colmar

Liebherr-France SAS

Colmar

Liebherr-Grues à Tour SAS

Niederhergheim

Liebherr-Grues Mobiles SAS

Niederhergheim

Liebherr-Location France SAS

Niederhergheim

Liebherr-Malaxage & Techniques SAS

Niederhergheim

Liebherr-Mining Equipment Colmar SAS

Colmar

Liebherr-Mining Equipment SAS

Colmar

Liebherr-Nenzing Equipements SAS

Niederhergheim

Germany

Liebherr-Aerospace Lindenberg GmbH

Lindenberg

Liebherr-Baumaschinen

Vertriebs- und Service GmbH

Kirchdorf an der Iller

Liebherr-Betonpumpen GmbH

Neu-Ulm

Liebherr-Components Biberach GmbH

Biberach an der Riss

Liebherr-Components Deggendorf GmbH

Deggendorf

Liebherr-Components Kirchdorf GmbH

Kirchdorf an der Iller

Liebherr-Elektronik GmbH

Lindau

Liebherr-EMtec GmbH

Kirchdorf an der Iller

Liebherr-Ettlingen GmbH

Ettlingen

Liebherr-Hausgeräte GmbH

Ochsenhausen

Liebherr-Hausgeräte Ochsenhausen GmbH

Ochsenhausen

Liebherr-Hydraulikbagger GmbH

Kirchdorf an der Iller

Liebherr-International Deutschland GmbH

Biberach an der Riss

Liebherr-IT Services GmbH

Kirchdorf an der Iller

Liebherr-Logistics GmbH

Kirchdorf an der Iller

Liebherr-MCCtec Rostock GmbH
Rostock

Liebherr-Mietpartner GmbH
Ludwigshafen am Rhein

Liebherr-Mischtechnik GmbH
Bad Schussenried

Liebherr-Nenzing Service GmbH
Hamburg

Liebherr-Purchasing Services GmbH
Kirchdorf an der Iller

Liebherr-Transportation Systems Mannheim GmbH
Mannheim

Liebherr-Verzahntechnik GmbH
Kempten

Liebherr-Werk Biberach GmbH
Biberach an der Riss

Liebherr-Werk Ehingen GmbH
Ehingen/Donau

Liebherr-Wohnungsbau GmbH
Kirchdorf an der Iller

Ireland

Killarney Hotels Ltd.
Killarney

Liebherr-Construction Equipment Ireland Limited
Rathcoole

Liebherr Container Cranes Ltd.
Killarney

Italy

Liebherr-EMtec Italia S.p.A.
Lallio

Liebherr-Italia S.p.A.
Monfalcone

Liebherr-Utensili s.r.l.
Collegno

Netherlands

Liebherr-Maritime Benelux B.V.
Amersfoort

Liebherr-Nederland B.V.
Amersfoort

Portugal

Liebherr-Máquinas de Construção Portugal, Lda.
Benavente

Spain

Liebherr Iberica, S.L.
Azuqueca de Henares

Liebherr Industrias Metálicas, S.A.
Pamplona

Sweden

Liebherr-Sverige AB
Västerås

Switzerland

Liebherr-Baumaschinen AG
Reiden

Liebherr-Components AG
Nussbaumen

Liebherr-Component Technologies AG
Bulle

Liebherr-Export AG
Nussbaumen

Liebherr-Hotels AG
Bulle

Liebherr-Industrieanlagen AG
Bulle

Liebherr-International AG
Bulle

Liebherr-Intertrading AG
Bulle

Liebherr Machines Bulle SA
Bulle

Liebherr-Service AG
Nussbaumen

Turkey

Liebherr Makine Ticaret Servis Limited Şirketi
İstanbul

United Kingdom

Liebherr-Great Britain Ltd.
Biggleswade

Liebherr-Rental Ltd.
Biggleswade

Liebherr Sunderland Works Ltd.
Sunderland

Eastern Europe

Azerbaijan

Liebherr-Azeri LLC

Baku City

Bulgaria

Liebherr-Hausgeräte Marica EOOD

Radinovo

Liebherr-Transportation Systems Marica EOOD

Radinovo

Czech Republic

Liebherr-Stavební stroje CZ s.r.o.

Brno

Hungary

Liebherr-Építőipari Gépek Magyarország Kft.

Győr

Kazakhstan

Liebherr Kasachstan TOO

Almaty

Poland

Liebherr-Polska sp. z o.o.

Ruda Śląska

Romania

Liebherr-Romania S.R.L.

Bucharest

Russia

Liebherr-Aerospace Nizhny Novgorod OOO

Nizhny Novgorod (75.1 %)

Liebherr-Nizhny Novgorod OOO

Nizhny Novgorod

Liebherr-Russland OOO

Moscow

Near and Middle East

Saudi Arabia

Saudi Liebherr Company Ltd.

Jeddah (60%)

United Arab Emirates

Liebherr Middle East FZE

Dubai

America

Argentina

Liebherr-Argentina S.A.

Buenos Aires

Brazil

Liebherr Aerospace Brasil Ltda.

Guaratinguetá

Liebherr Brasil Ltda.

Guaratinguetá

Canada

Liebherr-Canada Ltd.

Burlington, ON

Chile

Liebherr Chile SpA

Santiago de Chile

Colombia

Liebherr Colombia SAS

Bogotá D.C.

Mexico

Liebherr Mexico, S. de R.L. de C.V.

Mexico City

Liebherr Monterrey, S. de R.L. de C.V.

Monterrey

Liebherr Servicios Monterrey, S. de R.L. de C.V.

Monterrey

USA

HL Farm, LLC

Newport News, VA

Liebherr Aerospace Saline, Inc.

Saline, MI

Liebherr-America, Inc.

Newport News, VA

Liebherr Automation Systems Co.

Saline, MI

Liebherr Components North America Co.

Saline, MI

Liebherr Construction Equipment Co.

Newport News, VA

Liebherr Cranes, Inc.

Newport News, VA

Liebherr Gear Technology, Inc.

Saline, MI

Liebherr Mining & Construction Equipment, Inc.

Newport News, VA

Liebherr Mining Equipment Newport News Co.

Newport News, VA

Liebherr Nenzing Crane Co.

Medley, FL, and Houston, TX

Liebherr USA, Co.*

Newport News, VA

Africa

Algeria

Liebherr Algérie, EURL

Algier

Ghana

Liebherr-Ghana Ltd.

Accra

Morocco

Liebherr-Maroc SARL

Casablanca

Mozambique

Liebherr-Mozambique, Lda.

Maputo

Nigeria

Liebherr-Nigeria Ltd.

Abuja (90 %)

South Africa

Liebherr-Africa (Pty) Ltd

Springs

Zambia

Liebherr Zambia Ltd.

Lusaka

Far East/Australia

Australia

Liebherr-Australia Pty. Ltd.

Adelaide

India

Liebherr Appliances India Private Limited

Mumbai

Liebherr CMCTec India Private Limited

Pune

Liebherr India Private Limited

Mumbai

Liebherr Machine Tools India Private Limited

Bangalore (60 %)

Indonesia

PT. Liebherr Indonesia Perkasa

Balikpapan

Japan

Liebherr Japan Co., Ltd.

Yokohama

Malaysia

Liebherr Appliances Kluang SDN. BHD.

Kluang

Liebherr Sales Kluang SDN. BHD.

Kluang

New Caledonia

Liebherr-Nouvelle-Calédonie SAS

Nouméa

PR China

Liebherr (HKG) Limited

Hong Kong SAR

Liebherr LAMC Aviation (Changsha) Co., Ltd.

Changsha (50 %)

Liebherr Machinery (Dalian) Co., Ltd.

Dalian

Liebherr Machinery (Xuzhou) Co., Ltd.

Xuzhou

Liebherr Machinery Service (Shanghai) Co., Ltd.

Shanghai

Liebherr Purchasing (Dalian) Co., Ltd.

Dalian

Xuzhou Liebherr Concrete Machinery Co., Ltd.

Xuzhou (50 %)

Zhejiang Liebherr Zhongche

Transportation Systems Co., Ltd.

Zhuji (70 %)

Singapore

Liebherr-Singapore Pte Ltd

Singapore

South Korea

Liebherr Mobile Cranes Korea Ltd.

Seoul

Thailand

Liebherr (Thailand) Co., Ltd.

Rayong

The company marked * was founded in 2016.

Consolidated Financial Statements

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Consolidated Balance Sheet

Assets in m €	Notes	Dec. 31, 2015	%	Dec. 31, 2014	%
Intangible assets	3.1	53	0.4	46	0.4
Tangible assets	3.2	3,512	28.6	3,384	28.6
Shares joint ventures and associated companies	3.5	13	0.1	12	0.1
Non-current financial assets	3.5	96	0.8	96	0.8
Deferred tax assets	7	239	1.9	199	1.7
Non-current assets		3,913	31.8	3,737	31.6
Inventories	4.1	3,459	28.3	3,563	30.1
Receivables	4.2/4.3/4.5	1,910	15.6	1,842	15.5
Income tax paid in advance	7	74	0.6	61	0.5
Current financial assets	4.4	1,242	10.1	1,212	10.2
Liquid funds	4.6	1,664	13.6	1,433	12.1
Current assets		8,349	68.2	8,111	68.4
Total assets		12,262	100.0	11,848	100.0
Equity and liabilities in m €					
Subscribed capital		62	0.5	62	0.5
Revenue reserves	2.3/5	6,684	54.5	6,449	54.5
Equity of Liebherr-International AG shareholders		6,746	55.0	6,511	55.0
Non-controlling interests		15	0.1	14	0.1
Equity		6,761	55.1	6,525	55.1
Non-current financial liabilities	6	1,357	11.1	1,471	12.4
Post-employment benefits	8	609	5.0	590	5.0
Deferred tax liabilities	7	55	0.4	68	0.6
Non-current provisions	9	48	0.4	45	0.4
Other non-current liabilities	6	157	1.3	127	1.1
Non-current liabilities		2,226	18.2	2,301	19.5
Current financial liabilities	6	1,021	8.3	833	7.0
Payments received in advance		353	2.9	373	3.1
Income tax liabilities	7	49	0.4	52	0.4
Current provisions	9	556	4.5	546	4.6
Other current liabilities	4.5/6	1,296	10.6	1,218	10.3
Current liabilities		3,275	26.7	3,022	25.4
Total equity and liabilities		12,262	100.0	11,848	100.0

Consolidated Income Statement

in m €	Notes	Dec. 31, 2015	%	Dec. 31, 2014	%
Sales revenue	10	9,237	94.7	8,823	94.2
Increase or decrease of work in progress and finished goods		- 11	-0.1	- 17	-0.2
Other own work capitalised		346	3.6	276	2.9
Other operating income		173	1.8	286	3.1
Operating income		9,745	100.0	9,368	100.0
Cost of materials		-4,871	-50.0	-4,487	-47.9
Personnel expenses		-2,331	-23.9	-2,181	-23.3
Depreciation on non-current assets	3	- 448	-4.6	- 427	-4.6
Other operating expenses		-1,562	-16.0	-1,754	-18.7
Operating expenses		-9,212	-94.5	-8,849	-94.5
Operating result		533	5.5	519	5.5
Finance income		992	10.2	557	5.9
Finance cost		-1,092	-11.2	-576	-6.1
At equity result		1	0.0	1	0.0
Finance result		-99	-1.0	-18	-0.2
Result before tax		434	4.5	501	5.3
Taxes on income	7	- 140	-1.4	- 185	-2.0
Result after tax		294	3.1	316	3.3
of which shareholders of Liebherr-International AG		290	3.1	312	3.3
of which non-controlling interests		4	0.0	4	0.0

Consolidated Statement of Comprehensive Income

in m €	Dec. 31, 2015	Dec. 31, 2014
Result after tax	294	316
Post-employment benefits	1	- 145
Deferred tax	1	38
Items not recycled to profit or loss	2	- 107
Foreign exchange translation differences	3	- 47
Change in fair value of cash flow hedges	- 56	- 88
Deferred tax	21	31
Items recycled to profit or loss	- 32	- 104
Other comprehensive income	- 30	- 211
Comprehensive income	264	105
of which shareholders of Liebherr-International AG	259	100
of which non-controlling interests	5	5

Consolidated Statement of Changes in Equity

in m €	Subscribed capital	Value fluctuations on financial instruments	Foreign exchange translation differences	Other revenue reserve	Equity of Liebherr-International AG shareholders	Non-controlling interests	Group equity
Dec. 31, 2013	62	42	102	6,226	6,432	10	6,442
Result after tax				312	312	4	316
Other comprehensive income		- 58	- 47	- 107	- 212	1	- 211
Comprehensive income		- 58	- 47	205	100	5	105
Dividends				- 21	- 21	- 1	- 22
Dec. 31, 2014	62	- 16	55	6,410	6,511	14	6,525
Result after tax				290	290	4	294
Other comprehensive income		- 34	1	2	- 31	1	- 30
Comprehensive income		- 34	1	292	259	5	264
Dividends				- 24	- 24	- 4	- 28
Dec. 31, 2015	62	- 50	56	6,678	6,746	15	6,761

Consolidated Cash Flow Statement

in m €	Dec. 31, 2015	Dec. 31, 2014
Result after tax	294	316
Depreciation on non-current assets	448	427
Value fluctuations marketable securities (current assets)	-9	-42
Gain/Loss on disposal of non-current assets	1	-1
Change of provisions and post-employment benefits	24	-16
Other non-liquid expenses/income	-118	15
Decrease/Increase of stock	111	-1
Decrease/Increase of receivables and other current assets	-88	-9
Change of other liabilities	78	63
Decrease/Increase rental fleet	-127	-115
Net cash flow from operating activities	614	637
Payments for investments in intangible assets	-18	-16
Payments for investments in tangible assets	-450	-529
Payments for investments in financial assets	-2	-5
Payments for investments in marketable securities (current assets)	-108	-634
Proceeds from sales of intangible assets	2	0
Proceeds from sales of tangible assets	18	21
Proceeds from sales of financial assets	0	0
Proceeds from sales of marketable securities (current assets)	91	491
Other proceeds from investing activities	-1	0
Net cash flow from investing activities	-468	-672
Dividends paid, other distributions and equity capital repaid	-28	-22
Proceeds from current or non-current financial liabilities	476	308
Repayment of current or non-current financial liabilities	-385	-256
Net cash flow from financing activities	63	30
Net increase/decrease in liquid funds	209	-5
Foreign exchange translation difference on liquid funds at beginning of period and on cash flows	22	5
Liquid funds at beginning of period	1,433	1,433
Liquid funds at end of period	1,664	1,433
Income tax paid and reimbursed	-195	-204
Interest paid/Interest received	-9	-9
Payments for investments in leased assets	0	-8

Notes to the Consolidated Financial Statements

1 Corporate information and business activity

The company was founded in 1949 by Dr. Hans Liebherr. Currently, the family business has more than 41,000 employees working in more than 130 companies around the world. The share capital of Liebherr-International AG, Bulle, Switzerland, amounting to 62 million € (100 million CHF) is held exclusively by the Liebherr family.

For the construction sector and the mining industry, the Group develops, produces and distributes worldwide construction cranes, mobile cranes, crawler cranes, hydraulic excavators, material handlers, duty-cycle crawler cranes, wheel loaders, crawler loaders and tractors, pipelayers, telescopic handlers, mining trucks as well as concrete mixing plants, concrete pumps and truck mixers. In addition, Liebherr develops, produces and distributes worldwide ship cranes, floating cranes, offshore cranes, container and mobile harbour cranes for the cargo handling industry. The activities range across machine tools, automation systems and engineering projects in the machine and plant construction industry, and landing gears, flight control and actuation systems as well as air management systems in the aerospace industry. Furthermore, Liebherr manufactures equipment for rail vehicles in the transportation technology area. For household and commercial refrigeration and freezing, Liebherr produces a variety of products with great benefits for end-users. In the component area, the Group specialises in the development, design and manufacture of products in the mechanical, hydraulic and electric drive and control categories. Moreover, Liebherr operates six hotels in Ireland, Austria and Germany.

2 Accounting policies

2.1 General principles

The Group's consolidated financial statements for the year ended December 31, 2015 are prepared following the standards of the International Accounting Standards Board (IASB) in London.

They are in accordance with all International Financial Reporting Standards (IFRS) and interpretations by the International Financial Reporting Interpretations Committee (IFRIC) applicable for annual periods beginning on or after January 1, 2015.

The accounting and reporting principles applied to these consolidated financial statements comply with Swiss Corporation Law as well as with IFRS. The prior year values are prepared in accordance with the same principles, insofar as newly applicable standards also apply to prior periods.

The annual financial statements are prepared according to the historical cost principle with transactions being recognised and reported in the period when they occur. Any divergence from this principle is specifically mentioned. The reporting period of Liebherr-International AG and its subsidiaries ends on December 31. The functional currency is the Euro, as it is the predominant currency in the Group.

To improve comprehensibility and relevance, several details required by IFRS are summarised in the notes. These details are disclosed correctly in the original group consolidated financial statements.

2.2 Basis of consolidation

The consolidated financial statements are prepared based on the individual financial statements of Liebherr-International AG and its subsidiaries, which are audited by independent auditors and prepared using consistent accounting policies. The consolidated financial statements include the annual financial statements of Liebherr-International AG as a parent company and of all subsidiaries in which Liebherr-International AG directly or indirectly holds a majority of voting rights, or otherwise controls according to IFRS 10.

No companies have newly been established during the financial year 2015 by means of start-up, acquisition or restructuring.

Acquired companies are fully consolidated from the time when the Group has control according to IFRS 10. They are accounted for using the purchase method under which identifiable assets, liabilities and contingent liabilities are measured at fair value on the date of acquisition. Any remaining residual value is recorded as goodwill in the respective functional currency of the company acquired. Any goodwill is not systematically amortised, but is reviewed for impairment at least on an annual basis. Sold companies are deconsolidated at the time the Group ceases to have control and any gain or loss is recognised in the income statement.

Investments for which the Group does not exercise control but a significant influence, are classified as associates or joint ventures and accounted for using the equity method according to IFRS 11. The Group's share of net assets is presented in the balance sheet under shares joint ventures and associated companies and the share of profit of joint ventures and associates is shown in the income statement under at equity result.

The consolidated financial statements include investments in joint ventures and associate companies. Material investments are as follows:

- Eisengiesserei Dinklage GmbH, Dinklage, Germany,
- Somatel-Liebherr Spa, Ain Smara, Algeria,
- Aerospace Transmission Technologies GmbH, Friedrichshafen, Germany.

2.3 Translation of foreign currency

Foreign currency transactions are converted at the spot rate as of the transaction date. Monetary assets and liabilities in foreign currency are translated at the balance sheet date exchange rate. All gains and losses are recognised in the income statement. Assets and liabilities in financial statements of subsidiaries are converted to Euro using the balance sheet date exchange rate. For the translation of the income statement and the cash flow statement, the average exchange rate of the annual period is used. Exchange rate differences arising from the conversion of the income statement of affiliated companies are recognised separately in the other comprehensive income until disposal.

For the most significant currencies, the following exchange rates have been applied:

			2015		2014	
			Year end rate in €	Average rate in €	Year end rate in €	Average rate in €
Switzerland	CHF	1	0.9229	0.9370	0.8317	0.8233
USA	USD	1	0.9185	0.9017	0.8237	0.7537
Great Britain	GBP	1	1.3625	1.3781	1.2839	1.2405
Australia	AUD	1	0.6713	0.6784	0.6744	0.6796
Russia	RUB	1	0.0124	0.0149	0.0138	0.0199

2.4 Financial instruments

A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity. Purchases and sales of financial instruments are recognised using the trading date.

Financial assets and liabilities are recognised when the Liebherr Group becomes a party to the contractual obligations of the instrument. Financial assets are derecognised when the contractual rights to receive cash flows are fully transferred to a third party or they have expired. In cases the rights to receive cash flows are neither transferred nor retained a derecognition is only relevant to the extent control has been transferred. If the Group retained control, the Group continues to recognise the instrument to the extent of its continuing involvement. A financial liability is not derecognised until the liability is extinguished, i.e. when the obligation specified in the contract is discharged or cancelled or expires. The initial and subsequent measurement of the various financial instruments used by the Liebherr Group depends on the classification in accordance with IAS 39.

Financial instruments at fair value through profit or loss

This category includes financial assets and liabilities designated upon initial recognition at fair value through profit or loss and financial assets, inclusive of derivatives, held for trading. Derivatives designated as hedging instrument as defined by IAS 39 are excluded. All financial instruments in this category are measured at fair value with gains or losses arising from changes in fair value recognised in the income statement in the relevant period (finance income or finance cost). In general, the fair value of the financial instrument bases on market prices (Level 1 Inputs and Level 2 Inputs of the fair value hierarchy). Valuation techniques (Level 3 Inputs) using non observable input parameters are not applied. There were no financial instruments whose fair values could not be determined with sufficient reliability.

Loans and receivables

This category represents loans granted by the Group and accounts receivable trade. Financial assets within this category are recognised at fair value plus transaction costs that are directly attributable to the acquisition or issue of the financial asset upon initial recognition and subsequently measured at amortised cost. At each balance sheet date or under certain circumstances (e.g. significant financial difficulties of the debtor), the carrying amount of the financial instruments in this category are assessed for any impairment. Any impairment losses, which are determined by comparing the carrying value of the instrument to the fair value, are recognised in the income statement. If there is objective substantial evidence in subsequent periods that the impairment of an asset is no longer applicable, the previously recorded impairment loss is to be reversed. However, the reversal of the impairment loss may not create a carrying value that exceeds what the carrying value would have been if normal amortisation charges had been considered (not considering the impairment).

Other financial liabilities

Other financial liabilities comprise all financial liabilities with the exception of derivatives. Financial liabilities are recognised initially at fair value including transaction costs. They are subsequently measured at amortised cost using the effective interest method. In addition to actual interest payments, finance costs include annual compound interest and pro rata transaction costs.

Financial guarantee contracts

A financial guarantee contract is a contract that requires the issuer to make specified payments to reimburse the holder for a loss. This loss incurs when a specified debtor fails to make payments in accordance with the original or modified terms of a debt instrument. In some cases, the creditworthiness of customers is guaranteed by the Liebherr Group to the financing party, i.e. a financial guarantee contract is issued in accordance with IAS 39.

3 Non-current assets

3.1 Intangible assets

Intangible assets acquired separately are measured initially at acquisition costs. Internally generated intangible assets from which the Group expects to receive a future benefit and which can be measured reliably are capitalised at their corresponding production costs. The production costs include all costs directly attributable to the production process and a proportionate share of production related overheads. Borrowing costs are not capitalised, as by definition intangible assets are not qualifying assets. Development costs for new products are not capitalised, as the future economic benefit can only be demonstrated after a regulatory approval and a successful launch of the products in the market.

All intangible assets are amortised over the lower of their expected economic useful life or the contractual length using the straight-line method. Intangible assets with indefinite useful lives are not amortised but are tested for impairment annually.

The estimated useful lives of the major classes of intangible assets are as follows:

Concessions	3 years
Industrial property rights and similar rights	3 years
Licences	3 years
Software	3-5 years

3.2 Tangible assets

Tangible assets are measured at costs less cumulative depreciation and cumulative impairment. As a depreciation method the straight-line method is used with a depreciation period corresponding to the useful life. Land is not depreciated on a systematic basis. Real estate not used for operational purposes is recognised as tangible asset and depreciated according to the same criteria as real estate used for operational purposes. Such property includes real estate (land and/or buildings or parts thereof) that is held for the purpose of generating rental income and/or for a future undefined purpose. Maintenance costs are capitalised when they extend the useful life or the production capacity of the asset. Other maintenance costs and repairs are recognised in the income statement as incurred.

The estimated useful lives of tangible assets are as follows:

Buildings	20 - 40 years
Machinery and equipment	5 - 21 years
Furniture	13 years
IT	3 - 5 years
Vehicles	8 - 11 years

Any gain or loss arising from the disposal of an asset is included in other operating income or expenses. The disposal of rental machines is recognised as revenue. The reversal of the related remaining book value from the disposal is treated as cost of materials. Tangible assets are derecognised upon disposal or when no future economic benefit is expected from their use.

Borrowing costs directly attributable to the purchase, construction or manufacturing of a qualified asset are capitalised during the period until the asset is brought into service and afterwards depreciated over the useful life of the asset. Other borrowing costs are treated as expenses.

Development of tangible assets as at Dec. 31, 2015:

in m €	Land and buildings	Technical equip. and machinery	Other equip., factory and office equip.	Adv. paym., assets under construction	Total
Acquisition and production cost as at 1/1	2,575	2,325	1,186	272	6,358
Additions	79	335	111	207	732
Disposals	-14	-344	-44	-1	-403
Transfers	135	35	34	-204	0
Foreign exchange differences	-4	-1	9	3	7
Acquisition and production cost as at 31/12	2,771	2,350	1,296	277	6,694
Accum. depreciation and impairment as at 1/1	847	1,351	776	0	2,974
Depreciation of the year	105	209	118	0	432
Accum. depreciation on disposals	-8	-185	-37	0	-230
Impairment	1	2	2	0	5
Transfers	2	0	-2	0	0
Foreign exchange differences	2	-9	8	0	1
Accumulated depreciation as at 31/12	949	1,368	865	0	3,182
Net book value 31/12	1,822	982	431	277	3,512

Development of tangible assets as at Dec. 31, 2014:

in m €	Land and buildings	Technical equip. and machinery	Other equip., factory and office equip.	Adv. paym., assets under construction	Total
Acquisition and production cost as at 1/1	2,275	2,267	1,087	355	5,984
Additions	122	315	131	232	800
Disposals	-4	-314	-48	-3	-369
Transfers	238	59	14	-311	0
Foreign exchange differences	-56	-2	2	-1	-57
Acquisition and production cost as at 31/12	2,575	2,325	1,186	272	6,358
Accum. depreciation and impairment as at 1/1	763	1,293	702	0	2,758
Depreciation of the year	95	206	114	0	415
Accum. depreciation on disposals	-3	-154	-41	0	-198
Impairment	0	2	0	0	2
Transfers	0	3	-3	0	0
Foreign exchange differences	-8	1	4	0	-3
Accumulated depreciation as at 31/12	847	1,351	776	0	2,974
Net book value 31/12	1,728	974	410	272	3,384

Other equipment, factory and office equipment include mainly computer equipment, furniture, vehicles, transportation equipment, tools and fixtures.

The net book value of 3,512 million € (2014: 3,384 million €) corresponds to 52.5 % (2014: 53.2 %) of the historical cost. The recognised impairment loss relates to the rental equipment.

The carrying amount of tangible assets held under finance leases amounts to 69 million € (2014: 67 million €) and can basically be allocated to land and buildings as well as to technical equipment and machinery. The carrying amount of land and buildings contains the capitalised borrowing costs amounting to 10 million € (2014: 12 million €).

3.3 Leasing

The Group primarily is both a lessor of its self manufactured construction machinery and a lessee of other tangible assets. The classification of leases according to IAS 17 is based on the extent to which risks and rewards incidental to ownership of a leased asset lie with the lessor or the lessee. Therefore, depending on the situation the leased asset is recognised as finance or operating lease in the financial statement of the lessor or the lessee.

Self constructed assets capitalised under tangible assets but leased out under an operating lease are recognised at production costs. All other leased out equipment is recognised at acquisition costs. All rental equipment is depreciated using the straight-line method according to the asset's useful life reflecting the lower of the market value or the calculated residual value of the asset. Lease income from operating leases is recognised in the income statement on a straight-line basis. With respect to financial leases, a receivable is recognised at an amount equal to the net investment in the lease. Lease payments are divided into interest and principal payments.

Payments for operating lease contracts where the Liebherr Group is the lessee are recognised as an expense in the income statement on a straight-line basis over the lease term. Assets acquired under a finance lease are capitalised under IAS 17 at the fair value or, if lower, at the present value of the minimum lease payments at the commencement of the lease. At the same time the liability resulting from future minimum lease payments is recognised as a financial liability. The leased asset is depreciated using the straight-line method over the estimated useful life of the asset or over the lease term, if there is no reasonable certainty that the lessee will obtain ownership by the end of the lease.

If sale and lease back transactions result in finance leases, any profit will be deferred and amortised over the lease term. In case of operating leases, which are established at fair value, any profit or loss is recognised immediately.

3.4 Impairment of non-current assets

Impairment losses on intangible and tangible assets will be recognised at each reporting date if there are indications that, following an event or due to changing circumstances, the book value is overvalued. If the carrying amount of an asset exceeds the recoverable amount (value in use or fair value less costs to sell) the asset will be written down to this lower amount. If necessary, intangible and tangible assets are combined to cash generating units.

3.5 Non-current financial assets

The non-current financial assets include shares in associated companies and joint ventures, loans and non-current marketable securities. Shares in associated companies are accounted for using the equity method of accounting. Loans are carried at amortised costs. Non-current marketable securities are designated upon initial recognition at fair value through profit or loss. Management of these financial assets is in accordance with a documented investment strategy and their performance is assessed based on the change in fair value. This information is distributed internally to the key decision makers of the Group.

4 Current assets

4.1 Inventories

Inventories are recognised at acquisition/production costs. Production costs include costs directly related to the units of production and a systematic allocation of fixed and variable production overheads. The allocation of fixed production overheads is mostly based on the normal capacity of the production facilities; otherwise it is based on the actual level of production. Selling costs, administrative overheads and borrowing costs are not capitalised. Raw materials and merchandise are generally measured at acquisition costs. For raw materials the acquisition cost reflect the lower of the last purchase price and the weighted average price. Sufficient allowances are recorded for risks with regard to obsolescence and surplus stock as well as for losses of pending transactions by depreciation or writing down on the net realisable value.

in m €	2015	2014
Raw materials and supplies	1,277	1,347
Work in progress	832	843
Finished goods and merchandise	1,348	1,369
Payments made in advance for inventories	2	4
Total	3,459	3,563

4.2 Construction and service contracts

Construction and service contracts are recognised using the Percentage of Completion method. They are recognised based on the agreed contractual revenues by reference to the stage of completion. The disclosure is in accounts receivable, respectively accounts payable, net of prepayments received from customers. The stage of completion is determined based on the proportion of contractual costs incurred for work performed as of balance sheet date to the estimated total contract costs or based on agreed milestones.

When the outcome of a construction contract cannot be estimated reliably, revenue is recognised only to the extent of incurred contractual costs. The profit on such a contract is only recognised when the stage of completion allows for a reliable estimate of contract revenues and contract costs to be incurred to complete the contract.

4.3 Accounts receivable trade and other current assets

Accounts receivable trade and other current assets, if not derivatives, are classified as loans and receivables. An allowance for doubtful accounts is recognised when there is objective evidence that such receivables are not recoverable (e.g. due to bankruptcy, payment default or other financial difficulties of the debtor). The amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows. The allowance is based on internal group guidelines, according to which individual allowances must be deducted first. Based on the age of receivables, an additional systematic allowance between 20 % and 100 % is made on the residual balances according to the age of each receivable. The payment terms and outstanding receivables are regularly monitored locally by all subsidiaries. Furthermore, safeguards in the form of prepayments and down payments are established.

4.4 Marketable securities and other financial assets

The financial assets in these categories are classified, based on an internal risk management and investment strategy, as financial assets at fair value through profit or loss. The management of these assets is based on a written investment strategy and performance is measured on fair value. This information is distributed internally to the key decision-makers of the Group.

in m €	2015	2014
Shares	326	327
Mutual funds	73	75
Fixed income securities	811	753
Other securities	32	57
Total securities and other financial assets at fair value	1,242	1,212
Fixed deposits with a residual term more than 3 months	0	0
Total	1,242	1,212

4.5 Derivative financial instruments

Within the Liebherr Group, this position predominantly includes forward currency contracts, currency options, currency swaps, interest rate swaps and interest rate currency swaps to hedge its foreign exchange and interest rate risks. All derivatives, if they do not qualify for hedge accounting in accordance with IAS 39, are classified as financial instruments at fair value through profit or loss.

To hedge the interest and foreign currency risks resulting from its operational activities, financial transactions and investments, the Liebherr Group makes use of derivative financial instruments. The goal is to reduce volatility in the income statement. A hedging relationship must fulfill various criteria relating to the documentation, the probability of occurrence, the effectiveness of the hedging instrument and the reliability of the measurement in order to qualify for hedge accounting in accordance with IAS 39.

Under certain circumstances, a derivative financial instrument designated as a hedging instrument can be used to hedge the exposure to variability in cash flows that is attributable to a particular risk associated with a recognised asset or liability or a highly probable future transaction or the foreign currency risk in an unrecognised firm commitment. Exclusively in the aerospace division, Liebherr Group uses hedging instruments in cash flow hedges. Thereby the exposure to variability of future cash flows in foreign currencies which could have an effect on profit or loss is hedged. The effective portion of the gain or loss of the hedging instrument is recognised in other comprehensive income when the criteria for hedge accounting are fulfilled. These other comprehensive income amounts reflecting the cumulated value changes of the hedging instruments are, simultaneously, transferred to the income statement when the hedged transaction affects profit or loss or upon initial recognition of an asset or a liability. If the forecasted transaction is no longer expected to occur, the hedge is no longer effective and the amounts previously recognised in other comprehensive income are transferred to the income statement. The ineffective portion of the gain or loss of the hedging instrument is recognised directly in the finance result.

4.6 Liquid funds

In addition to cash on hand and cash in banks, short term deposits with an original maturity of three months or less are considered as liquid funds.

4.7 Non-current assets held for sale

Non-current assets are classified as held for sale if the sale of these assets is highly probable within the next twelve months. They are measured at the lower of carrying amount and fair value less cost to sell.

5 Equity – value fluctuations of financial instruments

Under this position the effective portion of the gain or loss of the hedging instrument in a cash flow hedge is recognised in accordance to IAS 39 in other comprehensive income (OCI) without being recorded in the income statement.

6 Financial liabilities and Other liabilities

Financial liabilities include amongst others liabilities to banks, obligations under finance leases, liabilities arising from recourse factoring and bank liabilities from discounted bills of exchange. Other liabilities include, for example, liabilities from repurchase obligations with end-users. Both financial liabilities and other liabilities are reported gross and either classified as other financial liabilities or as financial liabilities at fair value through profit or loss.

Financial liabilities

in m €	Current	Non-current	Total 2015	Current	Non-current	Total 2014
Bank liabilities	958	1,283	2,241	754	1,421	2,175
Liabilities from leases	58	72	130	72	46	118
Accounts payable from non-genuine factoring	0	2	2	0	4	4
Bank liabilities from discounted bills	5	0	5	7	0	7
Total Financial liabilities	1,021	1,357	2,378	833	1,471	2,304

Other liabilities

in m €	Current	Non-current	Total 2015	Current	Non-current	Total 2014
Liabilities from repurchase obligations with end-users	0	111	111	0	109	109
Accounts payable trade	634	0	634	635	0	635
Liabilities from personnel expenses and social security	254	0	254	245	0	245
Tax liabilities and customs	89	0	89	85	0	85
Derivative financial instruments	187	0	187	102	0	102
Deferred income	33	0	33	37	0	37
Further liabilities	99	46	145	114	18	132
Total Other liabilities	1,296	157	1,453	1,218	127	1,345

7 Income taxes

Income taxes include both current and deferred taxes which are recognised to determine the result for the period. Current income taxes (income or corporation tax, business tax and corresponding foreign taxes) are the amounts resulting from taxable income or loss to be paid to or recovered from the relevant tax authority.

Current income taxes for the actual period and prior periods are recognised as a liability to the extent that they have not yet been paid. If the amount already paid in respect of current and prior periods exceeds the amount due for those periods, the excess is recognised as an asset. The benefit relating to a tax loss that can be carried back to recover current tax of a previous period is recognised as an asset.

Current tax liabilities (tax assets) for the actual and prior periods are measured at the amount expected to be paid to (recovered from) the taxation authorities, using the tax rates (and tax laws) that have been enacted at the reporting date or that will be enacted in the near future. Current income taxes are recognised in the income statement, except current income taxes relating to items priorly recognised in other comprehensive income.

Deferred tax assets and liabilities are recognised in accordance with IAS 12 for temporary differences between the carrying amount of an asset or liability in the balance sheet and its tax base. The deferred tax assets also include future tax reductions from the expected use of losses brought forward. Deferred tax assets are only recognised if there is sufficient probability that future taxable profit will allow the deferred tax asset to be recovered. Deferred tax assets and liabilities are measured at the tax rates that are expected to apply to the period when the asset is realised or the liability is settled. The announcements of new tax rates (and new tax laws) by the government have been considered for the measurement of deferred tax assets and liabilities. The formal enactment is not relevant unless the temporary differences balance themselves under the old tax law.

The carrying amount of deferred tax assets is reviewed at each reporting date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred income tax asset to be recovered. Conversely, a previously unrecognised deferred tax asset is recognised to the extent that it has become probable that future taxable profit will allow the deferred tax asset to be recovered.

Deferred taxes are charged or credited directly to other comprehensive income if the taxes relate to items that are credited or charged directly to other comprehensive income in the same or a different period.

Deferred income tax assets and deferred income tax liabilities are offset, if a legally enforceable right exists to set off current tax assets against current income tax liabilities and the deferred income taxes relate to the same taxable entity and the same tax authority.

8 Employee benefits

Employee benefits consist of pension obligations, commitments related to anniversary bonuses and partial retirement agreements. There are various employee benefit plans in the Group, which are individually aligned with local conditions in their respective countries. They are financed either by means of contributions to legally independent pension/insurance funds, or by recognition as employee benefit liabilities in the balance sheet of the respective subsidiaries.

The net periodic costs with regards to defined contribution plans to be recognised in the income statement are the agreed contributions of the employer. In case of defined benefit plans, the period costs are determined by means of actuarial valuations by external experts using the projected unit credit method which are prepared on a regular basis. The calculation of net periodic costs and employee benefit liabilities implies that statistical methods and variables are employed. These variables include, for example, estimations and assumptions concerning the discount rate. Furthermore, actuaries use a wide range of statistical information for actuarial calculation of employee benefit liabilities which can deviate significantly from actual results due to changes in market conditions, the economic situation as well as fluctuating rates of withdrawal and shorter or longer life expectancy of benefit plan participants. Termination benefits related to partial retirement agreements are recognised at the present value of such obligations.

9 Provisions

Provisions are only recognised in the balance sheet if the Liebherr Group has an obligation to a third party that resulted from a past event, and if a reliable estimate of the obligation can be made. Possible losses from future events are not recognised in the balance sheet. Restructuring provisions will only be recognised if the respective costs can be determined reliably by reference to a plan and if there is a corresponding obligation resulting from a contract or notification.

Provisions 2015 in m €	Warranty obligation	Compensation and product liability	Expected loss from pending transactions	Other provisions	Total
Current provisions	393	20	60	83	556
Non-current provisions	0	6	14	28	48
Total provisions	393	26	74	111	604
Reconciliation					
Dec. 31, 2014	378	15	78	120	591
Increase	132	13	29	46	220
Usage	-104	-6	-32	-24	-166
Transfers	0	12	0	-12	0
Reversal	-20	-8	-2	-22	-52
Discounting	0	0	1	1	2
Foreign exchange differences	7	0	0	2	9
Dec. 31, 2015	393	26	74	111	604

Provisions 2014 in m €	Warranty obligation	Compensation and product liability	Expected loss from pending transactions	Other provisions	Total
Current provisions	378	15	61	92	546
Non-current provisions	0	0	17	28	45
Total provisions	378	15	78	120	591
Reconciliation					
Dec. 31, 2013	386	18	96	118	618
Increase	128	5	26	55	214
Usage	-102	-4	-34	-39	-179
Transfers	6	1	-6	-1	0
Reversal	-43	-5	-6	-16	-70
Discounting	0	0	1	1	2
Foreign exchange differences	3	0	1	2	6
Dec. 31, 2014	378	15	78	120	591

10 Revenue recognition and profit realisation

Revenues from sales of goods and services are recognised when the related significant risks and rewards of ownership have been transferred to the buyer. Anticipated losses related to onerous contracts are provisioned. Revenue related to construction and service contracts is recognised and measured using the Percentage of Completion method.

Under financial leasing contracts where the Liebherr Group is the lessor, revenue is recognised at the lower of the regular selling price or the present value of the future minimum lease payments. Also, sales gains or losses are determined applying the same method as for direct sales transactions. The lease payments by the lessee are split into an interest and a principal portion. The interest portion is recognised based on a pattern reflecting a constant periodic return on the outstanding net investment of the lessor.

Revenue from operating leases is recognised on a straight-line basis over the lease term, unless another systematic basis is more representative of the time pattern in which the user benefit derived from the leased asset is diminished. As such, income from lease payments is recognised proportionally. The difference between payments received and income recognised is deferred.

Sales proceeds from rental equipment disclosed under non-current assets are not recognised until actual transfer of risks and rewards related to the assets occur.

Report of the Statutory Auditor

*To the Board of Directors of
Liebherr-International AG, Bulle
Berne, June 3, 2016*

Report of the independent auditor on the summary consolidated financial statements

The summary consolidated financial statements of Liebherr-International AG, Bulle, which comprise the balance sheet as at December 31, 2015, the income statement, statement of comprehensive income, cash flow statement and statement of changes in equity for the year then ended, and related summary notes, are derived from the consolidated financial statements prepared in accordance with International Financial Reporting Standards (IFRS) and audited in accordance with International Standards on Auditing (ISA). We expressed an unmodified audit opinion on those consolidated financial statements in our report dated June 3, 2016.

The summary consolidated financial statements do not contain all the disclosures required by IFRS. Reading the summary consolidated financial statements, therefore, is not a substitute for reading the audited consolidated financial statements of Liebherr-International AG.

Board of Directors' responsibility

The Board of Directors is responsible for the preparation of a summary of the audited consolidated financial statements on the basis described in the notes to the summary consolidated financial statements.

Auditor's responsibility

Our responsibility is to express an opinion on the summary consolidated financial statements based on our procedures, which were conducted in accordance with International Standard on Auditing (ISA) 810, "Engagements to Report on Summary Financial Statements".

Opinion

In our opinion, the summary consolidated financial statements derived from the audited consolidated financial statements of Liebherr-International AG for the year ended December 31, 2015 are consistent, in all material respects, with those consolidated financial statements, on the basis described in the notes.

Ernst & Young AG

Prof. Dr. Thomas Noesberger
Licensed audit expert
(Auditor in charge)

Florian Baumgartner
Licensed audit expert

Five-Year Summary

in m €	2011*	2012	2013	2014	2015
Sales revenue	8,334	9,090	8,964	8,823	9,237
Investments	669	854	830	816	751
Depreciation	376	434	405	427	448
Non-current assets	3,069	3,348	3,521	3,737	3,913
Current assets	7,568	7,840	7,998	8,111	8,349
Equity	5,904	6,274	6,442	6,525	6,761
Liabilities	4,733	4,914	5,077	5,323	5,501
Result after tax	484	552	364	316	294
Personnel expenses	1,777	1,986	2,100	2,181	2,331
	2011	2012	2013	2014	2015
Employees	35,333	37,801	39,424	40,839	41,545

* Note: Only the 2011 amounts are based on IAS 19 (1998).

