



DECARBONISATION AND DIGITALISATION

In early November Liebherr held an information tour for the international trade press in Ulm and Bad Schussenried, Germany where it revealed its latest developments. The trip, which marked 50 years of Liebherr press tours, mainly focused on the work the company is doing in terms of the environment and new technology.

Liebherr has grown from a small family business set up by Hans Liebherr in 1949 in Kirchdorf an der Iller, with the development of one of the world's first mobile tower cranes - the TK10 - for his small construction company. Its success formed a solid base on which the company grew and grew into a diversified global group companies with revenues last year of €12.6 billion but is still family owned and managed.

FINANCIALS

By 2019 Liebherr's revenues had reached €11.75 billion but sank back to €10.3 billion in 2020 as the pandemic stuck. This year's figures are expected to come in at around €13.5 billion - this in a year when its sales of equipment machines to Russia we hampered by sanctions. Steffen Günther of Liebherr International says the company has 'lost' about €200 million of sales into Russia - mostly to Chinese built equipment. "The downturn in the construction and housing sectors meant that there was reduced demand for tower cranes and also household appliances," he said. "However, the company takes a long-term approach to investment spending €863 million on research and development last year, compared with €742 million in 2022. We have also added an additional 520,000 square metres of space at the Ehingen, Germany facility for mobile and crawler cranes as well as expanding the hydraulic cylinder plant and central logistics in Oberopfingen,

Germany and adding a new manufacturing site for welded components and pre-assembly work for cabs in Nambesheim, France."

Stephen Albrecht, managing director of Liebherr International added that decarbonisation and digitalisation is driving technology development for the company to be net zero by 2050.

ALTERNATIVE DRIVES

In 2022 Frontier Economics conducted a life cycle analysis of greenhouse gas emissions for construction equipment and concluded that no single power source/drive system can reduce the maximum emissions for all types of equipment. It found that low and zero emission technologies include:

Electrification: Plug in AC, battery, Plug in and battery combinations and hydrogen fuel cell.

Clean internal combustion: Hydrogenated Vegetable Oil (HVO) and E-fuels, Hydrogen and Hybrid - Internal combustion/Electric

Other areas: mostly improving the efficiency of existing power trains.

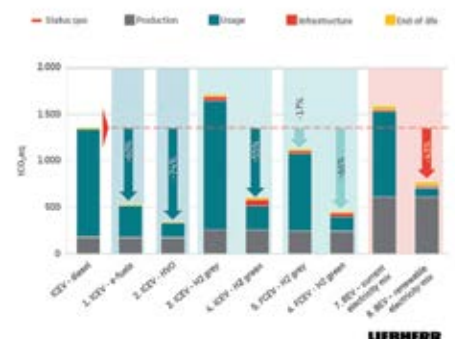
An example of the CO2 lifecycle assessment for a 60 tonne LTM 1160-5.1 All Terrain crane carried out by Frontier Economics - including production, usage, infrastructure and end of life - is quite revealing.

Using the base line of the diesel powered LTM 1160-5.1, it compared how various power sources affect the total CO2 emitted during its life.



(L-R) Steffen Günther managing director Liebherr International, Stephen Albrecht managing director Liebherr International and Heinz Klemm head of Liebherr Digital Development Centre

Liebherr Group Frontier Economics: Lifecycle assessment of a mobile crane LTM 1160-5.1



How the total output of CO2 of a Liebherr LTM 1160-5.1 All Terrain crane compares with various power sources

Perhaps surprisingly simply switching to HVO fuel for the standard machine resulted in the greatest reduction - 74 percent. This was followed by green Hydrogen with a 66 percent reduction and then E-fuels with 60 percent. The worst result with a significantly higher CO2 level was grey Hydrogen.



The LPO 100E battery power pack mounted on a trailer

ALTERNATIVE DRIVE TECHNOLOGIES

Liebherr is already using different drive technologies on some equipment. Its new 50 tonne LTC 1050-3.1 city type All Terrain crane features an electric motor for superstructure movements in addition to its conventional chassis engine. Using HVO fuel reduces the CO2 emissions by up to 90 percent.

The latest hybrid MK 88-4.1 E mobile self-erecting tower crane can be powered with HVO for the chassis and AC grid electricity for crane functions allowing the crane to operate locally with zero emissions and little noise. Alternatively, Liebherr's Liduro Power Port (LPO) system can supply the electricity. The LPO 100E battery power pack can be mounted on a trailer if required and has a constant power output up to 160kW. This allows hybrid or electric equipment to be operated or charged locally. Liebherr says other sizes of LPO will be available in the future.



The hybrid MK 88-4.1 mobile self-erecting tower crane

The company has also made a significant investment into hydrogen engine development and test facilities. Its first hydrogen engine - the six cylinder H966 - is being used in a 100 percent hydrogen fuelled R 900 series H2 tracked excavator. Liebherr also has a battery electric wheeled loader. Its new Betomix and Mobilmix concrete batching plants use frequency drives



Liebherr's first hydrogen engine - the six cylinder H966

on the mixer and skip to avoid power peaks cutting energy consumption by 30 percent, while reducing wear on mechanical parts.

When asked about flywheel technology for saving energy with tower cranes, Albrecht said that Liebherr would be taking the battery rather than mechanical route but that whatever the solution it would be included with the crane rather than a separate package.

He also highlighted the company's remanufacturing programme with components including transmissions offering customers a greener alternative to new parts, resulting in savings of up to 75 percent in raw materials and 60 percent in CO2.

DIGITISATION

Liebherr's digital development centre was set up in July 2020 and is based in Ulm. Marcel Flir, head of digital business and strategy said: "The aim of our digital solutions is to create measurable added value for our customers and partners, through greater efficiency, safety and operating comfort leading to time and cost advantages."

There are many apps and platforms for use with much of the equipment - here are a few related to cranes.

MYLIEBHERR

The central platform for digitalisation is MyLiebherr where all the digital services are bundled together. It works across all applications and plays a crucial role in every division of the group offering digital services and application software. It can also be used to contact Liebherr and its service partners.

TOWER CRANE PORTAL 2.0

The central digital platform of the tower cranes division has undergone a comprehensive update and is now fully integrated into MyLiebherr. The digital crane details have been redesigned and contain all the essential machine data at a glance - sales information, operating instructions, technical information, data sheets or service forms are all centrally available, including via smartphone.



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CRANE PLANNER 2.0

With the operation planner for mobile and crawler cranes under MyLiebherr, customers can easily plan crane operations, integrate them into the real environment via Google Maps or generate 3D representations. From this, planning reports including visibility of all set-up codes, ground pressures, bottlenecks and the required footprints, can be created without the need for a knowledge of CAD.

CRANE FINDER

After entering data on the load, required height and desired radius, the Crane Finder displays a range of mobile and crawler cranes that can

handle the job - including possible configurations. The objective is to find the right crane for a given lift quickly and easily. The Crane Finder web application is available free of charge via the MyLiebherr portal and can be used on a variety of devices.

DIGITAL MOBILE CRANE OPERATOR

The Liebherr eLearning course on digital mobile crane operation is intended to provide training support on how best to avoid pitfalls. Learning is carried out online independently and at flexible times. More than 18 units of around 60 minutes are available.



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MYNOTIFIER

The MyNotifier monitoring tool provides real time data for wind conditions and battery status. The wind sensors on the boom of a crawler crane constantly measure wind speeds and taking the boom and jib configuration and machine set up into consideration, continuously adjusts and controls the available load charts. An early warning system informs the operator of any anticipated critical wind speeds, in order to provide sufficient warning of any anticipated dangerous situations - so that in extreme cases the boom can be lowered if need be. For the new Liebherr Unplugged machines, MyNotifier also shows the live status of the battery.

PERFORMANCE MOBILE CRANES

In addition to the machine's location data, the fleet data management solution for mobile and crawler cranes shows a host of other live data, such as fuel consumption, current wind speed, the weight of the load on the hook or when the next service is due for the crane. The customer can also generate their own reports in the system for a specific construction site, including fuel consumption or CO2 emissions. New cranes will increasingly have the necessary cellular modem on board as standard. Cranes in the field can also be retrofitted, while Liebherr will cover telecommunication costs.



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LIDURO POWER PORT APP

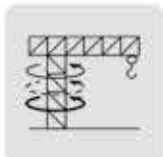
The Liduro Power Port app allows remoted monitoring of functions and status of the power pack, including state of charge, power input and output, energy input and output or location. Advanced functions included energy input and output measurement for specific time ranges and a lock mode. ■

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PRECISION IN MOTION



70m JIB LENGTH | MAX CAPACITY OF 12t | 3 TOWER SYSTEMS



T-Torque



Terex
Power Plus



Easy Setup



Terex
Power Match



T-Link



Electric
by Nature