



SUSTAINABILITY, RECYCLING AND RENEWABLES

Sustainability, recycling and renewables are three huge topics that involve how we reduce the use of non-renewable resources and cut pollution, while helping reduce human impact on the planet and its climate, rather than leave it to future generations to deal with. This whole topic is massive, sometimes divisive and one that is almost impossible to cover in depth in one feature. But here goes...

Before we delve deeper, it might be handy to confirm what the terms mean.

SUSTAINABILITY

Sustainability is defined as meeting our present needs without hurting the ability of future generations to meet theirs. From an environmental point of view, this involves protecting clean air, water and soil by using clean renewable energy such as wind or solar power instead of burning fossil fuels. Businesses can practise corporate sustainability by shifting focus from short term profits to longer term value creation by managing their environmental, social, and financial impacts, a framework often referred to as ESG (Environmental, Social and Governance) or the Triple Bottom Line.

Environmental actions involve cutting carbon footprints by switching to renewable energy sources to power factories and offices, redesigning products for the circular economy model, enabling them to be easily recycled, reused or composted instead of landfill and sorting supply chains, as well as sourcing raw materials from suppliers without causing deforestation or overexploiting natural resources and reducing waste by implementing water recycling systems and aiming for 'zero waste to landfill' manufacturing processes.

RECYCLING

Recycling is the process of collecting, sorting and processing used or discarded materials to transform them into new raw materials and products. The benefits include saving resources and energy - because recycled products tend to use less energy than making them from scratch,

while reducing the volume of materials sent to landfill, helping lower environmental pollution.

RENEWABLES

A renewable resource is a natural asset that is replenished naturally over time at a rate equal to or faster than it is consumed. This includes solar energy, wind power, and water to generate power. Using them creates far lower greenhouse gas emissions than burning coal or oil, and through proper management ensures they remain available for future generations.

SO HOW ARE WE DOING?

Over the past 20 years or so, the number of companies working on this has risen exponentially, so that today almost every significant business around the world has taken on some form of sustainability, recycling or renewable projects.

Some businesses have adopted the principles more than others. Last month we featured Dingli's

Deqing mega factory - possibly one of the most hi-tech manufacturing facilities in the world with almost every eco feature available.

These include onsite electric car charging ports, photovoltaic solar panels on the roof, skylights in the manufacturing halls and offices reducing the need for artificial light, workshops constructed with insulated wall materials to recover solar and thermal energy to reduce the demand on air conditioning and rainwater harvesting systems for irrigation, with captured water reused to keep the landscaped areas and plants watered.

The company has also moved towards paperless offices using interactive screens, while a green roof garden providing additional planted space and seating for staff. On the manufacturing side, Dingli has a very high level of automation with an automated assembly line and a circular production chain to reduce transportation and energy consumption.



Dingli's Deqing hi-tech mega factory has every eco feature available

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From a product point of view, Dingli claims to be the first manufacturer in the industry to electrify its entire range of aerial work platforms and added a line of completely oil free scissor lifts, using electric actuators in place of hydraulic cylinders. It has also introduced battery recycling technology, integrating battery control elements designed to achieve whole vehicle kinetic energy recovery.

But whatever the size and type of manufacturing, most companies are seeking environmental savings - even if it is just using solar panels on the roof or operating electric vehicle fleets. For rental companies and contractors, most small equipment such as scissor lifts, compact telehandlers, spider cranes and smaller All Terrain cranes are increasingly available with battery power not only reducing CO2 but also noise pollution.

ENERGY STORAGE SYSTEMS

The last few years have seen a huge growth in battery energy storage systems on construction sites - powering equipment and providing electricity for site offices resulting in huge cost and CO2 savings.

This trend started about five years or so ago in some countries. In the UK contractor Bowmer + Kirkland was an early adopter in replacing diesel generators with energy storage systems to power tower cranes on site. Within a year, this had expanded to include tower cranes, hoists and mastclimbers, as well as the site offices - in fact everything that needed plug-in power on site.



Bowmer + Kirkland was an early adopter in replacing diesel generators with energy storage systems to power tower cranes on site



A battery storage system powering mastclimbers and hoists

Since then, there has been a significant trend away from diesel generators towards the rapidly growing range of energy storage systems, all of which deliver significant cost savings through the reduced size of the grid connections and the volume of diesel used.

SIGNIFICANT SAVINGS

One example of this is the Dutch battery energy storage manufacturer Neargrid, which already provides energy solutions to more than 300 construction sites across Europe. It claims that using UK diesel prices, contractors can typically save £4,500 (\$6,000/€5,000) a month when you combine fuel, generator rental, maintenance, breakdowns, Clean Air Zone charges and refuelling logistics.

The UK is one of those countries that has legally binding Net Zero targets, with major contractors - such as Mace, Laing O'Rourke and Skanska UK - all committed to eliminating diesel use ahead of 2050 - the legal requirement. UK diesel prices are among the highest in Europe and Clean Air Zones are being enforced in cities such as London, Birmingham and Manchester, with battery powered sites operating without restrictions.



Neargrid already provides energy solutions to more than 300 construction sites across Europe

Leading contractors in other parts of Europe have been using battery energy storage systems for longer. For example, in Belgium UZ Gent eliminated a 700kVA genset which was using 400 litres of diesel a day from a University Hospital site in Belgium, replacing it with two Neargrid Boost packs with zero diesel consumption, saving a tonne of CO2 per day. Dura



A Neargrid Boost on a site in Belgium

Vermeer working on the City Hall in Amersfoort, Netherlands is running three Liebherr 280 EC-H cranes from a single 55kVA grid connection using three Neargrid Boost 200kVA packs. In the Port of Antwerp five Liebherr 150-370 EC-B tower cranes are powered by two Neargrid Boost and two 60kVA gensets, dramatically reducing fuel use.

REUSE PRODUCTS

One of the best ways to achieve sustainability is to reuse or keep equipment longer, perhaps refurbishing older products so that they can have a second life. The Liebherr Reman programme gives used components a second life through remanufacturing, returning them to 'as new' quality while contributing to the overall circular economy. This allows customers to reduce costs and downtime through flexible remanufacturing options including component exchange, overhaul and repair. Remanufacturing includes combustion engines, fuel injectors, hydraulic pump and motor repairs, gearboxes and hydraulic cylinders, rope winches and electric motors.



The Liebherr Reman programme gives used components a second life through remanufacturing

Liebherr's programme has been operating for 20 years and now operates from 15 sites around the world, employing more than 550 people remanufacturing more than 7,500 major components each year as well as lots more individual parts.

REMAN - THREE LEVELS

The Reman programme offers three remanufacturing levels: exchange of components, general overhaul, and repair, each tailored to the customer's individual needs and timeframe.

By participating in the reuse cycle, customers also enjoy significant savings on materials as well as a reduction in maintenance and downtime, as Reman components are more affordable and

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The Liebherr remanufacturing process saves energy, reduces landfill waste and cuts overall CO2 output by up to 50 percent

readily available. Liebherr can remanufacture used components, making them as good as new in terms of performance and reliability. The remanufacturing process also saves energy, reduces landfill waste and cuts overall CO2 output by up to 50 percent.

NEWER DEVELOPMENTS

On new cranes, aerial work platforms and telehandlers, manufacturers are introducing more



A MEC all-electric zero oil scissor lift with lithium ion battery pack for longer cycle times and faster recharging

features that make them more environmentally friendly or reduce resources, whether that is materials, fuel or man-hours. As mentioned earlier, zero-oil machines stop hydraulic oil leaks and contamination, while electric drive motors are more reliable and require less maintenance. Improvements to batteries mean they charge

quicker and run longer. Manufacturers are using a far higher proportion of common parts, allowing economies of scale and increased availability, while more materials are being used that can be easily recycled or reused.

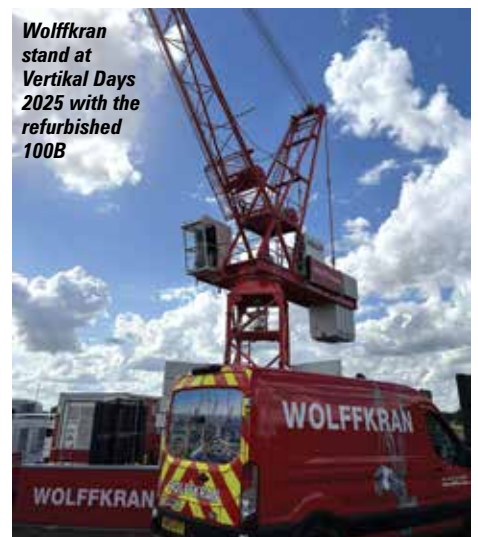
TECH CONNECTIONS

Most buyers of new machines expect them to be connected with fleet management and equipment diagnostics, with the latest being digital access control and over the air software updates along with AI. All of which can make the equipment easier to use, as well as identify and fix problems should they occur, cutting the number of engineer call outs and site visits, saving the fuel and pollution they generate, while also helping to recover stolen equipment.

But perhaps the ultimate sustainability method is to use equipment longer - either keep it operational for a year or two more (depending on its running costs), or have it refurbished for a second life. There has been a noticeable increase in companies refurbishing/rebuilding equipment over the past year or two. Whether that's due to the politics of sustainability or it just being more cost effective, it's happening.

REFURBISHED OR NEW

More OEMs are offering refurbishments or rebuilds, including Wolffkran, Niftylift and Grove, to name a few. At Vertikal Days last year Wolffkran displayed a fully refurbished 29 year old 100B luffing jib tower crane to show how refurbished cranes can be as safe and perform as well as a new one. The company has now completed numerous such refurbs with benefits including faster delivery - 12 weeks versus 30 weeks for new - and around a 30 percent cost saving against a new crane. The refurbishments



Wolffkran stand at Vertikal Days 2025 with the refurbished 100B

are carried out at Wolffkran's Luckau factory in Germany, involving complete disassembly, NDT testing, repairs, repainting, and reassembly with new or refurbished parts.

Refurbishing and reusing tower cranes significantly reduces raw material and energy consumption, resulting in CO2 emission savings of up to 92 percent when compared to manufacturing a new crane. Extending the lifetime of existing cranes supports the circular economy and maximises resource use. Modern components - new winches, inverters and PLCs etc - are integrated into the refurbished cranes, enabling them to match the features of new models. Wolffkran highlights the documentation and traceability with each refurbished crane with detailed records, including original and refurbishment dates, parts lists, and manuals reflecting the work done.

GROVE REBUILD

A Qatari oil and gas company refurbished one of its 20 year old, 55 tonne Grove RT700E Rough Terrain cranes rather than replace it. The work was carried out by local Grove dealer Mannai Heavy Equipment through Manitowoc's EnCore programme, taking 12 weeks to complete. It



The 20 year old Grove RT700E during the refurbishment



The Wolffkran 100B in various stages of refurbishment

included structural and component repairs along with system upgrades and the replacement of key wear parts.

Mannai service manager Magdy Fawzi said: "EnCore is about maximising value through tailored solutions that breathe new life into these trusted machines. But it's not just about extending the working life, it's about enabling our customers to confidently tackle ambitious projects, knowing their equipment meets the highest standards of reliability and capability."

19 YEAR OLD NIFTYLIFT REFURB

At Vertikal Days this year aerial lift manufacturer Niftylift will display a refurbished 12 metre HR12NDE Mk1 narrow-aisle bi-energy boom lift that dates back to 2007, in order to highlight what is involved in a full factory refurbishment and why the company treats used equipment as part of its core business.

The HR12NDE MK1 traded in by a UK rental company went through a full factory refurbishment at the company's Milton Keynes facility. The lift arrived in good enough structural condition to justify a full rebuild. Niftylift says that it was not built as a showpiece but is representative of work its service department does routinely.

Niftylift works to three defined standards for used equipment:

- Fully serviced covers the replacement of damaged parts and service items such as filters, with a LOLER inspection.
- Reconditioned adds partial repainting where necessary and the replacement of heavily worn or damaged components, with a full service and

LOLER inspection.

- Full factory refurbishment, the standard applied to this HR12NDE, means a total strip down, a repaint of the entire machine, new parts wherever required, and a LOLER inspection before it leaves the building. In this case, that included new paint, a new basket, new hoses and new batteries, along with a few smaller replacements.

None of this is new, Niftylift has supplied refurbished and reconditioned machines for years. What has changed is that the three standards are now clearly defined and consistently applied, so a buyer knows exactly what has and has not been done to the machine before they commit to purchase.

IS IT WORTH THE EFFORT?

"Yes," says Niftylift, "because its structural design optimisation means the steel structures stand the test of time, so bringing a used machine back to life is usually a question of replacing the consumables rather than addressing structural fatigue. A design philosophy that favours component standardisation keeps parts available two decades on, while development testing now targets component longevity as well as reliability."

"Those economics also allow us to confidently offer decent part exchange offers against new machines. For customers, it is a financially viable route to renewing a fleet."

The circular argument follows. Machines that might otherwise have gone for scrap are stripped, rebuilt and put back to work. If this HR12NDE is properly maintained, there is no reason it should not run for another two decades.

"We build machines that are structurally sound for far longer than one working life, so scrapping them at 10 or 15 years old is a waste of a good machine," says Niftylift's Tom James. "Taking a machine back in part exchange, stripping it and rebuilding it to factory standard is good for the customer, good for us, and it keeps a lot of usable steel out of the recycling stream."

As a guide, a full factory refurbished HR12NDE Mk1 costs around half that of a new machine with the same specification. For an end user or a smaller rental company, a saving on that scale can be the difference between a capital purchase that returns and one that does not, and it puts a machine finished to factory standard within reach of buyers who would otherwise be looking at something considerably older or less well presented. ■



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