

Cummins

ISSUE 8: WINTER/SPRING 2023

MAGAZINE

GREEN QUEST

Keestrack and Cummins on the journey to a cleaner future



INNOVATION

ICE COOL WITH HYDROGEN

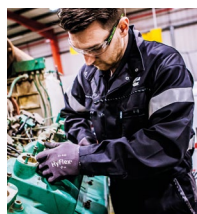
Cummins is at the head of the new power revolution and wowed the world with its B6.7H hydrogen internal combustion engine (ICE) truck



CUSTOMER SUPPORT

SERVICE WITH CERTAINTY

Service agreements have a crucial role to play in helping customers plan their business growth and operate with maximum efficiency



MARINE

WAVES OF EMOTION

Luxury yacht maker Apreamare's new Gozzo 45, powered by two Cummins QSC8.3 engines, carries forward a tradition of elegance



Welcome

Welcome to the winter/spring 2023 edition of the Cummins Magazine.

There are some key themes running through the pages ahead of you: our dedication to service; advances in our technical and technological capabilities; and our focus on recruiting and developing the best young talent across Europe.

These are exciting times for Cummins as we look ahead to a new age of clean and sustainable power. We look forward to sharing the stories of that journey.

Get in touch

We love hearing about customers' experience with Cummins.

If you are using Cummins products and services and would like to tell us more about your project, contact Cummins Distribution Europe Marketing Department via marketing.europe@cummins.com

To request extra copies of this magazine, please contact us using the email address above.

Credits
Editor: Tony Cheverall
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The Publisher accepts no responsibility for any opinions. Every effort is made to ensure that information in the Cummins Magazine is correct but Cummins accepts no responsibility for inaccuracies or errors or any consequences arising from them.

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Alexandra Andersson is a poster girl for career opportunities for women within Cummins. The Swedish service technician is working on some of the most powerful mining machines on earth.

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Cummins and Turkish bus and coach builder Otokar are celebrating a partnership which has seen the delivery of more than 20,000 engines.



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The Turf Gamechanger, fitted with a Stage V 154 hp Cummins F3.8, is revolutionising the economics of golf course and sports lawn maintenance.



Together, we WILL get there

Ann-Kristin de Verdier reflects on her first full year at the helm of Cummins' European sales and distribution business and highlights four key areas of focus

1. Working in partnership

Working together will help smooth the pathway to a zero emissions future says Ann Kristin de Verdier, Executive Managing Director of Distribution Europe.

Through its Destination Zero strategy, Cummins is making impressive strides in the journey toward sustainable clean energy.

However, the route forward is not expected to be straightforward, with some technologies moving faster than others, so Cummins is adopting a considered, strategic approach. "The opportunities are great but there is also a level of unpredictability," says Ann-Kristin. "What is not in doubt, however, is our level of support to businesses and market segments, and we will continue to do everything we can to support customers."

"The successful partnerships we have forged over many years are giving our customers the confidence that they – and we – can succeed with this critical transition to sustainability. Helping to solve problems is what we do, and we've been doing it for a hundred years and more."

Having visited every Cummins Distribution site across Europe, Ann-Kristin says she has a good feel for the opportunities for the brand.

"Our Stage V and Euro VI engines have been very successful, and they are going to be in service for many years to come. We will be there to support our loyal customers in the on- and off-highway sectors to keep their equipment running reliably and manage the total cost of ownership."

"And our power generation solutions are ready to provide power to data centres and other customers, particularly important with the challenges in energy supply that we are experiencing right now in Europe."

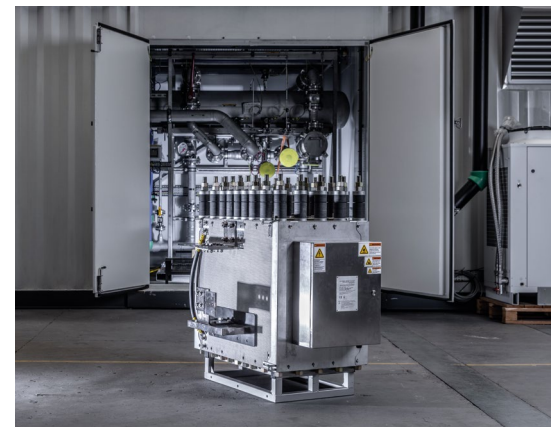
Above all, says Ann-Kristin, Cummins will be drawing on all its powers of aftersales support to give customers the resolve to move forward. "This is where the Cummins brand scores so highly: the ability through knowledge and experience to fully appreciate and embrace the needs of the customer and work in a spirit of partnership to achieve our common goals."

2. Opportunities in green hydrogen

Accelera by Cummins (see page 8) is investing heavily in the rapidly growing field of green hydrogen generation. Green hydrogen is an emissions-free fuel when

used in a variety of applications ranging from hydrogen fueling stations to large industrial processes. It is produced through water electrolysis using renewable electricity, such as solar, wind or hydropower.

In Europe, Accelera's proton exchange membrane (PEM) electrolyser manufacturing plant in Guadalajara, Spain is expected to be completed at the end of the year, and its Oevel factory in northern Belgium is being scaled up to one gigawatt to develop a new generation of electrolyser cell stacks to power large-scale hydrogen plants.



The 20,000 sqm Spanish plant will house system assembly and testing and have the capacity to produce 500MW of electrolyzers per year, scalable to more than 1GW per year.

"Accelera (by Cummins) is in a great position to drive the green hydrogen economy in Europe," says Ann-Kristin. "Our advancements in electrolyser technology are poised to open the door to new customers who use hydrogen in industrial and agricultural processes."

3. Investment in high horsepower support

Cummins' diesel engines are designed to go through multiple rebuild cycles, enabling customers to extract more value from their investment.

The stakes are especially high in the mining sector which deploys some of the mightiest machines on the planet and working in the most demanding conditions. It is here that Cummins' high horsepower engines really earn their crust.

With the scheduled opening of a new Rebuild Centre in Poland in 2023 (see page 17) Cummins is acknowledging not just a need for greater capacity to handle an ever-increasing installed base of diesel engines but a desire to carry out engine overhauls and rebuilds in the most pristine, most specialised environment.

"We are very excited about the opening of the new rebuild centre in the Krakow area," says Ann-Kristin. "This new, dedicated facility, which will operate to factory standards, will allow us to offer superior levels of quality to our customers operating high-horsepower engines, which is 19 litres and above."

Geographically, the Krakow centre is strategically placed to support high horse applications in mining, rail, industrial, marine and power generation markets across Europe.

4. Developing skills

Possibly the greatest challenge confronting not just Cummins but businesses in general across Europe is recruitment.



Cummins is in
a great position
to drive the green
hydrogen economy
in Europe

"People with technical skills are highly sought-after," says Ann-Kristin, "and we are doing everything we can – hiring and training people and increasing their knowledge of important fields such as electrical safety – to ensure we are in the best place to serve our customers."

Ann-Kristin says with such intense competition in the

market for jobs like service technicians, Cummins' focus has shifted to bringing in more apprentices and placement students and investing in their development.

"People in Cummins can start in any place and know we will invest in them all the way. A great example is two of my European



leadership team, who started as apprentices in manufacturing and engineering. This shows how career paths here can be flexible, with the ability to explore different areas of the business."

THE PASSION TO SUCCEED

Ann-Kristin's appreciation of the passion for service that is very much part of the Cummins 'DNA' has been sharpened by her time in her European leadership role.

"We are in the front line of our business, the 'face' of Cummins, and I have seen just how close we are to our customers and how committed we are to helping them get to where they want to be."

"We will work hand-in-hand with our customers as they go through their energy transition, supporting them all the way and helping them to choose the right technology as together we step through to Destination Zero."



CUMMINS ZEROES IN ON CLEAN ENERGY

Major moves in the mission to reduce carbon emissions

Cummins took the IAA Transportation show at Hanover by storm with a series of launches that showed how the company is at the leading edge of the clean energy revolution.

Pride of place went to a medium-duty concept truck powered by the B6.7H hydrogen internal combustion engine (H2-ICE).

The project utilised a Mercedes-Benz Atego 4x2 truck, a vehicle widely used across Europe for multi-drop distribution haulage.

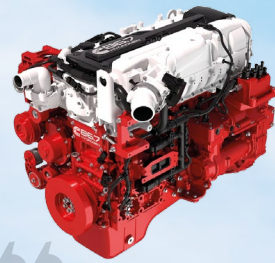
Performance, cargo capacity and payload are all unaffected by the substitution of the diesel engine for the H2-ICE, which integrates seamlessly with the existing driveline. A further benefit of the B6.7H is significantly quieter running than a diesel.

The proof-of-concept installation is rated 290 hp (216 kW) and features a 700-bar pressure high-capacity hydrogen storage system.

The H2-ICE conversion highlights the opportunity for truck applications across the 10-to-26T gross vehicle weight (GVW) range to operate on zero-carbon hydrogen fuel with a potential operating range of up to 500km.

"The H2-ICE concept truck puts Cummins at the forefront of this rapidly emerging internal combustion engine technology using zero-carbon hydrogen fuel," said Alison Trueblood, Cummins Executive Director – On-highway Business Europe.

"While Cummins hydrogen fuel cells offer a highly effective solution for specific applications within the truck industry, our hydrogen engines can also help accelerate fleet decarbonisation by offering a lower cost basis using more familiar engine technology."



The H2-ICE conversion highlights the opportunity for truck applications across the 10-to-26T gross vehicle weight (GVW) range to operate on zero-carbon hydrogen fuel with a potential operating range of up to 500km

Technical development work on the H2-ICE concept truck was carried out by the Cummins team at the Gross-Gerau facility in Germany, working alongside vehicle engineering specialists the EDAG Group.

The chassis accommodates twin carbon fibre-reinforced fuel tanks with a total capacity of around 40 kg of hydrogen, enhanced thanks to high (700-bar) working pressure. There is space for an auxiliary tank of around 10 kg.

A Cummins-designed fuel control module brings together the hydrogen fuel refill point, the fuel filtration and fuel distribution system in a single unit with easy access. Refilling the truck with hydrogen gas fuel is estimated to take just 10 minutes.

"The introduction of H2-ICE powered trucks over the shorter term can help develop the hydrogen fuel infrastructure to bridge the way forward for the wider adoption of fuel cell electric vehicles. In this way, hydrogen engines and fuel cells are complementary technologies, working together to drive the hydrogen economy forward," added Alison Trueblood.

DETAILS

For more information on Hydrogen engines scan the QR code or visit www.cummins.tech/cumminsmagazine2023-hydrogenengines



First look at fuel-agnostic X Series
Next-generation platform designed to meet Euro VII standard

Cummins showcased its new fuel-agnostic X Series platform with hydrogen, biogas and advanced diesel engines offering low-to-zero carbon fuel capability.

The next generation 15-litre and 10-litre displacement X Series is designed to accelerate the decarbonisation of heavy-duty, long-haul truck fleets while able to meet proposed ultra-low emission levels, including Euro VII regulations expected in 2027.

The fuel-agnostic architecture of the 15-litre X Series utilises a common base engine with cylinder heads and fuel systems tailored for the X15H to use carbon-free hydrogen and for the X15N to use biogas with up to 90% carbon reduction.

With X15H ratings up to 530 hp (395 kW) and X15N ratings up to 510 hp (380 kW), they are ideally suited for trucks up to 44-ton gross vehicle weight (GVW). The X15 advanced diesel can use either sustainable HVO fuel or B100 biodiesel with ratings up to 650 hp (485 kW) for the most demanding heavy haul duty-cycles.

The next generation X10 diesel engine with up to 450 hp (335 kW) output extends heavy-duty robustness down to a 10-litre displacement, offering low weight and a compact installation for vehicles across the 26-to-44 ton GVW range focused on maximising payload, as well as low-cab trucks for urban operations. The X10 design incorporates a similar fuel-agnostic capability to that of X15, with the potential to offer hydrogen and biogas versions.

A key design feature of the new X Series platform is a Double-Overhead-Camshaft (DOHC) which offers major advances in combustion and thermal efficiency.

The X10 features the latest evolution of Cummins XPI fuel system with extra-high pressure injection and a new electronic wastegate turbocharger enabling fuel savings of up to 7% compared to equivalent Euro VI engines today, dependent on duty cycle. Heavy-duty performance is also reflected with a peak torque of 2300 Nm, improving engine response and vehicle drivability.

Across a 320-to-450 hp (240-335 kW) ratings range, the X10 will meet anticipated Euro VII ultra-low emission levels with the new Heavy-Duty Compact Cross (HDCC) aftertreatment system developed by Cummins for enhanced emissions reduction.

The X15H hydrogen engine with direct-injection, lean-burn combustion will be available with ratings from 400-to-530 hp (298-395 kW) and a peak torque of 2600 Nm.

Running on zero-carbon green hydrogen fuel, the X15H will be able to offer a truck operating range in excess of 1,000km in combination with a 700-bar pressure high-capacity fuel storage system. H2-ICE powered heavy-duty trucks will be able to fully refuel in just 15 minutes.

The X15 advanced diesel features Cummins latest XPI ultra-high pressure fuel injection system and will offer a broad power range of 450-to-650 hp (335-485 kW) with an impressive 3200 Nm peak torque.

We're committed to tackling climate change, says Cummins CEO

Jennifer Rumsey, the President and CEO of Cummins Inc., reaffirmed the company's commitment to Destination Zero™, its strategy to reach net-zero emissions by 2050.

During her keynote address at Hanover, Rumsey outlined Cummins' 'dual-path' approach: reducing emissions from internal combustion engines while simultaneously investing in new, zero-emissions products.

"We have to act now," said Jennifer Rumsey, Cummins' first female CEO and recently named in the Forbes Most Powerful Women in Business list.

"The estimated impact of our dual path approach is an additional 1.4 gigatons of cumulative carbon reduction – the equivalent of removing all trucks from the road for three years."

Cummins spends around \$1billion a year on research and development of future technologies. "We power some of the world's most demanding and economically vital applications. There is no single technology that will work for all of our customers," said Rumsey. "We must advance solutions in a way that secures a sustainable future for the industries that keep the world running."

"That's why we have developed a company with the broadest range of ultra-low and zero-emission technologies dedicated to the commercial vehicle industry."



Accelera will power drive toward zero emissions

New brand reinforces commitment to sustainability

Accelera is the new brand for Cummins' New Power business unit. It provides a diverse portfolio of zero-emissions solutions for many of the world's most vital industries empowering customers to accelerate their transition to a sustainable future.

The launch of Accelera is a significant step forward in Cummins' efforts to achieve its Destination Zero strategy, focused on evolving Cummins technologies to reach zero emissions across its product portfolio.

Cummins' Destination Zero strategy is rooted in the understanding that multiple solutions are required to achieve industry-wide decarbonisation across the diverse applications the company powers.

Over the past several years, Cummins has invested more than \$900 million in research and technology, capital and acquisitions to build Accelera's leadership and technological capabilities.

Accelera is now a global leader in zero-emissions technologies, providing battery electric and fuel cell electric solutions across commercial and industrial applications with hundreds of electrolyzers generating hydrogen around the world today.

"Achieving our goal of reaching net-zero emissions by 2050 requires leveraging our entire portfolio of businesses," said Jennifer Rumsey, Cummins President and Chief Executive Officer.

"As we have continued to lead in and advance the engine-based solutions that power our customers' businesses, we have also built the broadest combination of zero-emissions technologies dedicated to the commercial vehicle industry like battery electric and fuel cell electric powertrain solutions and electrolyzers for green hydrogen production.

"Establishing Accelera reinforces our commitment to leading in zero-emissions solutions and highlights our unmatched ability to leverage our deep understanding of our customers' needs and applications, technical expertise and extensive service and support network to walk hand in hand with our customers throughout the energy transition."

Accelera is advancing a range of zero-emissions solutions, including hydrogen fuel cells, batteries, e-axes, traction systems and electrolyzers, to sustainably power a variety of industries from commercial transportation to chemical production.

Both a components supplier and integrator, Accelera is decarbonising applications like buses, trucks, trains, construction equipment, stationary power and carbon intense industrial processes.

"The purpose of Accelera is simple – to secure a sustainable future for the industries that keep the world running," said Amy Davis, President of Accelera.

"Launching this new brand drives additional focus in our business and enables us to stay ahead of the ever-changing zero-emissions landscape. By leveraging Cummins' deep understanding of our customers' needs and the demands of their applications, Accelera will deliver leading zero-emissions technologies necessary to accelerate the shift to zero."

Cummins' breakthrough technologies have reduced the company's product emissions by more than 90% over the past 25 years, and Accelera will continue to advance the company's path toward a zero-emissions future.



Recent European zero-emissions highlights that Accelera will continue to build on include:

Increasing electrolyser manufacturing capacity with a gigawatt-scalable plant under construction in Spain

Powering the world's first hydrogen refuelling station for ships, cars, trucks and industrial customers in Antwerp, Belgium

Powering the world's first megawatt-scale demonstration plant for storing wind energy in the natural gas grid in Windgas Falkenhagen, Germany

Powering the world's first fleets of hydrogen fuel cell passenger trains in Germany

Powering refuse trucks with FAUN across Europe

Cummins on a talent mission

Apprenticeships at the heart of a plan to build for the future

Cummins is continuing its drive to attract bright and ambitious new talent to its business in Europe.

The task is a complex one as different countries take different approaches to youth employment and career development, with some providing more structured support than others.

For example, in the UK, Germany, Poland, Spain and Turkey – where Cummins' facilities are based – there are established apprenticeship programmes and vocational training available nationally. However in other European countries, companies rely more on student placement and other initiatives to attract new people.

Regardless, Cummins is committed to find the best route to growing its pool of talent across the region in readiness for the challenges and opportunities presented by shifting economies and the evolution of new technologies.

Dean Hallam, HR Project Management Manager – Europe ABO, said modern apprenticeships were an attractive option not just for starting a career but for advancing and developing within an organisation.

"Apprenticeships today are more desirable as the scope is so much wider. They are a smart option for people who want to learn, gain new experiences and get a respected qualification all while being paid.

"There are more than 650 apprenticeship schemes approved for delivery in the UK and age is no barrier: with educational assistance funded through the UK Government's



Apprenticeship Levy you can be anywhere in your career and if you want to learn something new, you can, right up to Masters level."

Cummins offers apprenticeships not just in manufacturing and engineering but also in many fields including Quality, Human Resources, IT, Finance and Leadership, reflecting the diversity of the career paths available within the organisation and showing commitment for individual development throughout the business.

"We have great success across our European business in relation to attracting placement students and graduates and we would love to see the success we have seen with apprentices in the UK repeated across the region.

"We have more than 100 active apprentices in the UK and a number of current employees using apprenticeships to learn new skills. It's a great way to improve retention of employees because they will start with the company and then develop and grow, absorbing the corporate values, behaviours and goals.

"There's a huge loyalty dividend that comes from demonstrating your commitment to helping an employee achieve their potential."

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Votes of confidence in Cummins

Cummins has been voted in the top 10 UK companies for shift work based on employee reviews on job comparison site Breakroom. The ranking rates employers on whether they provide a fair wage, provide regular hours with optional flexibility, guarantee proper benefits and create a supportive workplace.

And this spring, Cummins will be hoping for a third consecutive strong placement in the RateMyApprenticeship UK national rankings. The company has been voted in the top 20 for the past two years.

Clean ahead

Keestrack has a friend on the path to zero emissions

Keestrack's R5e impact crusher was one of the big hits of Bauma 2022 in Munich

Keestrack, the internationally renowned manufacturer of crushers and screeners, intends to be at the forefront of the construction industry's drive toward a zero-emissions future.

On that journey, it will be paying close attention to developments at Cummins to see if it can build on a relationship which started around 10 years ago and introduce ever 'greener' machines powered by exciting new technologies currently at various stages of development, some of them well advanced.

As it stands today, Keestrack specifies engines from across Cummins' entire Stage V-compliant suite – the F3.8, B4.5, B6.7, L9, X12 and X15.

The universal emissions approval of the Cummins Performance Series engines is a huge advantage to the family-run business,

which has more than 1,000 employees and operates manufacturing facilities in the Czech Republic, Italy, China and India. There is an international network of more than 116 dealers and service partners in more than 100 countries.



Our customers want to see us further reducing emissions and operating costs. We know Cummins shares our vision of clean power



Keestrack's range of mobile machines includes screens and classifiers, impact crushers, jaw crushers, cone crushers, reversible impact crushers, stackers, tracked apron feeders, tracked power units and dust suppression systems.

Almost every part of a Keestrack machine

is manufactured in-house using high-grade steel for the optimum balance of strength and power-to-weight operating efficiency. They are famously reliable and easy to maintain.

Marcel Kerkhofs, Marketing Manager at the Belgian headquarters of the Keestrack Group, said Cummins is a strategic partner and he is excited at the potential for technologies such as fuel cells, battery-electric and hydrogen internal combustion.

"Ever since Keestrack was formed in 1996 by Kees Hoogendoorn and his wife Annet Schoenmaker, the company has been an innovator," said Mr Kerkhofs.

"We invented the world's first direct-feed screener on tracks, which is now an industry standard, we launched load-sensing hydraulics which dramatically reduced fuel consumption, and we started to electrify our equipment early, back in 2012.

"Now, a decade later, we are focussing on mobile electric plug-in and hybrid-driven crushers and screeners to further reduce emissions and operating costs. It's what our customers want to see, and we know Cummins shares our vision of clean power."

At Bauma 2022, Keestrack showcased its M5, one of three tracked engine units powered by Cummins, in this case the X12. The M5 serves Keestrack's new R5e impact crusher but can also power other electric driven equipment.

The ZERO drive equipment and the tracked engine unit, which serve as a back-up in case there is no plug-in via the grid available, were very well received by visitors to the show in Munich as potential users immediately saw the advantages.

The other tracked engine units introduced by Keestrack are the M4 (Cummins L9) which

serves Keestrack's B7e jaw crusher and its newly launched I4e reversible impact crusher, and the M7 (Cummins X15) which can power the H7e cone crusher.

With the exception of the H7e, the drop-off engines can be placed into the frame of the equipment (see *graphic*). "This is only possible because of the compactness of the Cummins engine architecture and aftertreatment set-up," said Mr Kerkhofs.

There are a number of advantages in using drop-off engines, he added, including reduced dust and vibrations for the engine and easier and less maintenance for the owner.

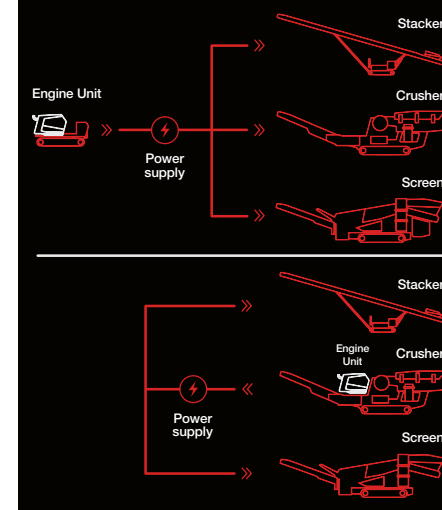
If one engine unit powers, for example, three electric machines, the maintenance and filter replacement is needed for only one engine, reducing downtime, lowering costs and creating more flexibility.

Go-anywhere power solution

Keestrack invented the concept of the drop-off module, a diesel engine with integrated generator set. Putting the module on tracks allows multiple connected Keestrack machines to be supplied directly with electricity, which is particularly useful when there is no plug-in connection from the grid available.

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If one engine unit powers, for example, three electric machines, the maintenance and filter replacement is needed for only one engine, reducing downtime, lowering costs and creating more flexibility.





B7e jaw crusher in action

Partners in power

Keestrack's involvement with Cummins started with the supply of Tier 3 engines. The relationship was paused in 2016 as Keestrack was taking stock of engine developments and future emissions requirements.

"We restarted conversations around our Stage V solutions," said Pawel Stolecki, Cummins' global account manager for the Keestrack business.

"Keestrack was impressed that while many manufacturers were just talking about Stage V, we actually had Stage V engines out there in the field, not just concepts in a brochure."

Another major factor in Keestrack's decision-making was Cummins' ability to support its products around the world, with dedicated teams of skilled application engineers.

Under the terms of their agreement, Keestrack stocks and sells Cummins replacement parts, ensuring swift supply to dealers.

We just look for the best solution and the best partner possible. Cummins has lots of advantages for us, not least because our equipment fits so well together

"The reason why the co-operation between our two companies is so good is that our approach to the market is very similar," said Pawel Stolecki. "We are both highly customer-oriented and ready to look at modifications and solutions that better suit the end user."

Mr Kerkhofs agreed, adding: "It is difficult for a global network like ours to please everybody. Certain customers want certain engines, and they will want certain power solutions."

"We just look for the best solution and the best partner possible. Cummins has lots of advantages for us, not least because

our equipment fits so well together.

"Also, we know Cummins, like us, is a relentless innovator, always searching for the most efficient and reliable solution to drive machinery."

"We both want to make a contribution to a better world and we do not take current solutions for granted. We have to keep on searching for

M5 tracked engine unit featuring Cummins X12



the best, most innovative solutions and manufacture high standard quality products which are profitable and sustainable.

"We are a company that's on the move and we can see Cummins is too."

DETAILS

From loaders to excavators and cranes, Cummins engines can be found in almost every type of construction equipment imaginable. For more information scan the QR code or visit www.cummins.tech/cumminsmagazine2023-construction For more information on Keestrack visit www.keestrack.com



Welcome aboard

Cummins B4.5 makes life easier for mariners

Cummins has introduced its new hybrid-compatible B4.5 propulsion and auxiliary engine, expanding the famously reliable and fuel-efficient Cummins Marine power range for recreational and commercial applications.

Available as a stand-alone engine with controls system, as a generator set or hybrid-ready package, the light but power-dense B4.5 is compliant with EU Stage V and RCD 2 regulations without the use of aftertreatment.

The B4.5 packs a mighty punch, offering a power range of 102-250 hp (112-186 kW) in propulsion power and 76-129 kWm in auxiliary power.

"The 99 kW commercial genset node is very popular in certain markets, and we expect the B4.5 genset package with a Cummins Stamford alternator will be an obvious choice when selecting power for operators for years to come," said Cedric Merveillaud, Marine Director of Cummins Europe.

"With the option of a one-stop shop for propulsion and auxiliary power, life becomes a lot simpler and more productive for boatbuilders and boat owners. They can now deal with one trusted brand – Cummins – for the entire power requirement of their vessel."

Thanks to its optimised turbo, the B4.5 has best-in-class peak torque, which not only provides greater acceleration but makes it easier to maintain speed, even for vessels with



high loads such as dredgers and fishing boats. The high-pressure common rail fuel system delivers class-leading fuel consumption and greatly reduced noise and vibration while the cast water-cooled exhaust manifold of the B4.5 makes for lower surface temperatures and improved overall performance.

The Air Intake System includes commercial and recreational reusable washable air cleaners for more cost savings.

The Electrical System is offered in both 12 and 24 volts with simple electrical OEM interface connections that can be integrated with Cummins' C Command Systems. A remote backup throttle option is also available for easier integration for vessels that require it.

The Electronic System includes automated push button start/stop controls easily integrated through the ECM. It also features engine protection and derate reducing the risk of catastrophic failure.

The B4.5 is easy to install, easy to service and easy to rebuild by trained technicians

from within a Cummins network that boasts more than 9,000 service and dealer locations, the largest such network in the world.

Cummins is confident in the total reliability of its engines and generator sets. The B4.5 engine is available with a base warranty of 24 months or 1,000 hours for high output and light duty applications; 24 months or 3,000 hours for intermittent duty applications; or 12 months or unlimited hours for continuous duty and prime power applications.

The B4.5 is offered with either dry or wet exhaust elbows which allows for easier integration with any vessels that need to be repowered.

"Because we understand that customer needs and operating conditions vary, we can offer a range of engines packaged with the customer's choice of engine monitoring and control systems," said Cedric Merveillaud.

"Our team works closely with partner suppliers and customers from vessel concept and continuing through installation, testing and commissioning to guarantee a product perfectly matched to vessel design, operating conditions and local content requirements."

PACKING A PUNCH

- In-line 4-cylinder, 16-valve, 4-stroke 4.5-litre diesel engine
- Available for commercial and recreational applications
- Compliant with EU Stage V and RCD 2 regulations without the use of aftertreatment
- Backed by Cummins warranty



DETAILS

For more information on Cummins B4.5 marine generator, scan the QR code or visit www.cummins.tech/cumminsmagazine2023-marine-b45i



Glory of the Gozzo

Cummins power for Apreamare's gorgeous luxury yacht

It was the gozzo Sorrentino, a wooden fishing boat distinguished by its clean, elegant lines, that inspired Giovanni Aprea more than 170 years ago to start a business building rowing and sailing boats. The company he founded in 1849 remains in Aprea family hands today and the spirit of the gozzo lives on in a range of majestic fibreglass-and-wood walkaround yachts whose craftsmanship is admired the world over.

Cummins is proud to be associated with the enduring Apreamare story, providing the power for its stunning new Gozzo 45 which made its world debut at the Cannes Yachting Festival in September 2022.

The Gozzo 45 features two Cummins QSC 8.3-litre engines of 600 hp each for a cruising speed of around 25 knots and maximum speed of around 30 knots.

The new 14.7m flagship of the Gozzo line was conceived by Cataldo Aprea, president of Apreamare, and brought to life by yacht designer Marco Casali of Too Design and hull specialist Umberto Tagliavini of Marine Design in collaboration with the Apreamare Technical Office.

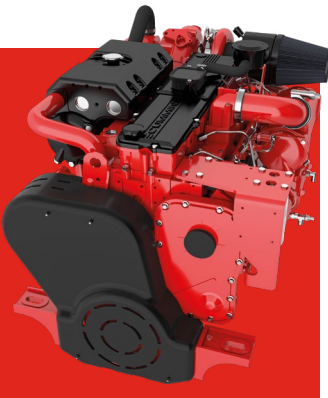
"Gozzo 45 is a vision of the future through tradition," said Marco Casali. "It personifies the expression of a shipyard that has reinterpreted the ancient charm of the Sorrento gozzo and updates it by adapting it to contemporary lifestyles."



"While respecting the traditional lines, it brings innovations in the shapes of the bow, in the lines of the hull, in the design of the superstructure and in the cut of the windows."

"We're the only yard in all these years to master the innovation and the development of an iconic boat like the Sorrento gozzo," said Cataldo Aprea. "Our main strength is that we are pioneers in this ongoing process of modernizing the gozzo making it always contemporary and progressive."

Conceived to allow integration with either traditional shaft line or stern drives, Apreamare's Gozzo line, which also features the Gozzo 35, combines speed, safety and stability at sea. Apreamare's other line is called Maestro. Both lines are highly customisable.



THE POWER TO IMPRESS

Cummins QSC8.3 for marine applications is a six-cylinder engine (four valves per cylinder) that offers industry-leading power density. Its innovative design characteristics yield increased durability while the high-pressure common-rail fuel system offers excellent economy and reduced noise. The power range is 490 to 600 hp (365-447 kW) and torque is 1327 lb-ft. The engine is built at the Rocky Mount plant in North Carolina, United States.

Stefano Unali, sales manager south Europe for Cummins marine engines, has been working alongside Apreamare since 2015, getting to know the business and understanding the needs of its customers.

"Apreamare is a very customer-centric company and likes to be able to offer a wide range of options, from the colour of the hull to the finer details of the interior and the materials that can be specified," he said. "The ethos is very much about quality, style and safety. We at Cummins relate to that."

Cataldo Aprea said the attraction of a partnership with Cummins was obvious: "We respect the fact Cummins is known around the world for the quality of its products. There is a clear demand from our customers not just for the performance of the Cummins engines but knowing there is a first-class service network to support them wherever they might be in the world."

Apreamare's own international distributor network is based mainly around the Mediterranean but reaches as far as Japan, Turkey and the United States.

DETAILS

For more information on Cummins engines for recreational marine scan the QR code or visit www.cummins.tech/cumminsmagazine2023-recreationalmarine



A family steeped in marine tradition

Following the death of Giovanni Aprea, his business passed to his son Cataldo and then on to Cataldo's sons, led by the eldest, Giovanni, the third generation of master boat builders.

Here's a timeline charting the thrilling Apreamare story to date:

1945 As soon as the Second World War ends, Giovanni has the brilliant idea to start fitting his boats with car engines. Thus were the first pleasure boats created, perfectly suited to ferrying passengers across the Bay of Naples to the famous island of Capri.

1973 Cataldo Aprea, President of the current day business, joins the family boatyard and begins a transformation of the production methods used.

1983 Encouraged by his successes, Cataldo decides he wants to venture out on his own and he sets up the Apreamare boatyard.

1988 Design flair meets pragmatic business genius when Cataldo teams up with Sorrentine entrepreneur Salvatore Pollio. Their first project is a triumph: The Smeraldo 7, a revolutionary gozzo with a fibreglass hull.

1990 The Smeraldo 9, the first gozzo with a planning hull and the fastest of its breed makes its debut at the Genoa Boat Show.

1995 Now with seven models in its portfolio, Apreamare builds about 60 boats a year

2001 About a year after becoming a joint stock company, Apreamare joins Ferretti group, one of the most prestigious group of brands in luxury yachting.

2002 Construction begins on the Torre Annunziata Nautical Centre, the current home of Apreamare

2005 Maestro 65, the first model in a new range, makes its debut

2008 Maestro 82, a luxurious 24m flagship for the entire Apreamare fleet, is launched

2010 On March 24th, the Aprea and Pollio families united to take back direct control of the Apreamare brand

2011 Smeraldo 45 makes its first public appearance, the first model in a new range of boat

2018 The Apreamare Yachts brand is born

2020 First sight of the Gozzo 35, with a hull designed by Umberto Tagliavini with input from the indefatigable Cataldo Aprea. This is the model that has really built the reputation of the shipyard and created its own niche – the 'gozzo'.

2022 The flagship Gozzo 45 is launched at Cannes Yachting Festival, followed a few weeks later by the Gozzo 35 Speedster, presented at the Fort Lauderdale International Boat Show in Florida



At your service – the way you want it

We speak to Chris Brown about an important tool that supports Cummins customers – The Service Agreement

Chris Brown is Director of Aftermarket Development and Channel Management for Cummins Distribution Europe.

From his base in the UK, Chris oversees the capability of Cummins' dedicated aftermarket business, service and dealer network, supporting customers across 38 countries.

For all the legendary quality and robustness of the Cummins product, ultimately it falls to the aftermarket business to further enhance the customer relationship by providing dependable, high-quality specialist support.

In this Q&A, Chris explains the importance of service agreements in providing customers with the flexibility and confidence they require.

Cummins Magazine (CM): Chris, what are service agreements?

Chris Brown (CB): They are an agreement between Cummins and its customer to provide comprehensive cover that meets the customer's

requirements and takes risk out of the equation. Typically, they would encompass maintenance (scheduled and non-scheduled), general servicing, 24/7 service and repair, parts and consumables.

CM: How customisable are your agreements?

CB: Our service agreements are entirely focused on what works best for the customer. Because Cummins powers more types of equipment in more markets than any other engine company, no two service agreements are the same. We have built an enormous bank of knowledge over the years and we have a solid idea of the demands likely to be placed on the equipment.

CM: Can you give us some examples of the flexibility of service agreements?

CB: Yes, mining is a good example. Where the machinery is operating in a remote location, it's critical for the customer to have a Cummins technician permanently on-site. We also support



Our service agreements are entirely focused on what works best for the customer

a variety of power generation applications such as hospitals and data centres where technician responsiveness is critical to ensure emergency back-up power for the location.

CM: What are the main benefits of having a service agreement?

CB: First and foremost, service agreements offer reassurance. The customer knows exactly how much they will be spending each month, helping with their total cost of ownership (TCO), and the geographic spread of our aftermarket service network means we can provide in-market, same-language expertise, which builds confidence with the customer.

CM: What are some of the typical tasks covered in the service agreement?

CB: Our product comes with a standard warranty, with options to extend it. Under the standard warranty, we will perform all the basic service and maintenance. Any additional troubleshooting and diagnostics can be performed along with any additional and necessary repairs to the engine and system. Our highly trained technicians are equipped with the best tools and connected technologies that can monitor and maintain engines and generators to ensure maximum uptime for the customer.

CM: What are customers looking for in their relationship with Cummins?

CB: What they value is a genuine partnership. Cummins can play a key part in their business strategy by helping them to respond to changing market and environmental conditions. We can also help them to plan and operate with certainty and peace of mind at a regular fixed cost.

CM: What do you think are your customers' biggest concerns right now?

CB: We understand that reliability and TCO are two of the most important factors in the customer's operation. We will always strive to support our customers with tailor-made plans that focus on maintaining product performance and maximising uptime at an affordable cost.

DETAILS

For more information on Cummins Care scan the QR code or visit www.cummins.tech/cumminsmagazine2023-cumminscare



Cummins to open HHP engine rebuild centre in Krakow

Cummins has chosen a site near the southern Polish city of Krakow as the location for a state-of-the-art Rebuild Centre for high horsepower engines.

The \$10 million facility will offer strategic support to customers across central Europe. It will provide greater capacity, enhanced capability and will increase Cummins' European footprint.

The investment is being made to support growing demand across several market segments for high horsepower engines – those of 19 litres and above – rebuilt and tested to Cummins' highest quality standards in a first-class manufacturing environment.

The new rebuild centre is due to open in late 2023. It will be an integral feature of a new base for Cummins Poland, which will include a warehouse, workshop and administrative offices. Staff will transfer to this new improved facility, which is only 7km from the current base.

The Kraków rebuild centre will complement Cummins' global network of purpose-built facilities dedicated to high quality rebuilds of Cummins high horsepower engines.

An engine rebuild includes complete disassembly, cleaning, inspection and replacing of major components, extending the life of the original engine and in many cases reducing fuel consumption and enhancing performance.

The new rebuild centre will be equipped with two 15-tonne overhead cranes, 10 jib cranes, a test cell with engine dynamometer, paint booth, plus a bake-and-blast cleaner.

High horsepower engines manufactured by Cummins operate in some of the harshest working environments and are renowned for their quality and durability.

A EUROPEAN NETWORK Cummins key service locations across Europe



Lifting the spirits

‘Think global, act local’ is a phrase that has particular resonance at Cummins, where employees across sites and Community Involvement Teams (CITs) are actively encouraged to support initiatives that benefit the places where they live and work. Here’s a selection of recent positive news stories from across Europe.



Cummins rises to refugee challenge

Cummins volunteer teams were quick to mobilise in the aftermath of the refugee crisis triggered by the conflict in Ukraine, offering vital support to families, women and children and helping them to rebuild their lives one step at a time.

For example, in Sweden and Germany, Cummins teams are working with local schools or community centres to support the integration of refugee children, including helping with childcare, homework and language; in Poland and Belgium, Cummins employees are working with community partners to help furnish accommodations for refugees and support them through their registration process; and in the Czech Republic, Cummins helped organise special summer camps for refugee families.

In England, Cummins’ long-standing relationship with the Kent Refugee Action Network (KRAN) enables employees to continue supporting initiatives focused on integration, education, language and employability for refugees.

“We are so fortunate to have incredible employees who care deeply about helping refugees in our communities and are willing to give generously of their time and talents to help in any way they can,” said Emily Johnson, Corporate Responsibility Director for Cummins Europe.

“When the crisis in Ukraine began, we immediately reached out to their local community partners working with refugees to ask how we could help.

“They kept us apprised of what was needed, and our support evolved from emergency donations at the start to now helping with sustainable education and integration for refugees in our communities.

“We know we have a role to play in helping to improve the situation for refugees in our communities. People from refugee backgrounds have faced tremendous challenges and bring skills, experience and wisdom that can make our communities and our business stronger and more resilient.”

Lighting the fuse for better job prospects

Cummins’ partnership with the Breaking Barriers charity in the UK is helping to give refugees the knowledge, confidence and experience they need to secure stable and fulfilling employment.

Refugees living in the UK face a number of barriers to employment, including language difficulties, non-recognition of qualifications, cultural differences and discrimination. As a result, refugees in the UK are four times more likely to be unemployed than people born in the UK.

Cummins has been delighted to join Breaking Barriers’ Fuse network, which brings together like-minded businesses to share best practices and take action to achieve more for refugees in the UK. Cummins volunteers are also leading employability workshops for refugees and serving as mentors.



CHANGING LIVES

Across Europe, Cummins volunteers are partnering with local non-profits in our communities to support refugees impacted by the Ukraine conflict and other crises. The numbers below reflect some of the impact these projects are having.

100

Refugees who will have a safe accommodation in Poland and Belgium

20

Refugee parents and their children who will learn Czech or Polish to feel included and heard in their new environment

300

Refugee women and children who have enough food in the shelters that have been created for them in Germany and Romania

90

Refugee children who will make new friends in a suburban outdoor camp in the Czech Republic

250

Refugees in Poland who will be less isolated because they receive childcare and educational support

94

Refugee infants around the Ukrainian-Romanian border area who are safer because their mothers have the critical items needed to care for them

26

Weeks of ‘Learning for Life’ classes that will support newly-arrived refugee youth with learning English and life skills in the UK

50

Primary school refugee children who will feel welcome and prepared for everyday school life in Germany

Getting a buzz out of saving bees

A lack of honeybees in agricultural areas is limiting the supply of some food crops, and there are worries that unless the decline is checked, there could be serious ramifications for global food security and the maintenance of biodiversity.

Cummins employees in Germany and Norway are doing their part to protect bees in their local communities.

In Germany, volunteers developed five bee colonies behind the Cummins Emission Solutions (CES) plant in Marktheidenfeld. Three team members also serve as beekeepers, as well as educators, inspecting hives, conducting bee population counts and removing honeycombs.

Other employees extract honey from the honeycombs, bottling and labelling the harvest. In the past year, the hives have produced more than 150kg of honey, offered to employees and given away to local community partners.

The Marktheidenfeld team also hosted a ‘Bee Day’ on site for local youth, including both an educational component as well as bee-themed games to help bring the education to life. Cummins’ beekeepers explained the lifecycle and importance of bees and the role they play in our ecosystem, all while exhibiting the bees in action.

In Norway, Cummins employees built six bumblebee boxes and planted bee-friendly flowers to support bee colony growth. The team continues their efforts in protecting and encouraging bee activity by maintaining the boxes while weeding and watering the surrounding plants.



Girl power at the fore Cummins supports gender equality

Cummins facilities across Europe celebrated International Day of the Girl in partnership with local school children.

At the Daventry and Darlington sites in the UK, children were invited onsite to discuss the STEM subjects (Science, Technology, Engineering and Mathematics) while in other Cummins locations like Krakow, Poland, employees engaged in STEM projects with pupils in local schools.

In the UK, students toured Cummins’ facilities, met members of the Cummins Women’s Empowerment Network and took part in some STEM related tasks.

On International Day of the Girl, Cummins hosted a webinar where school children and employees across Europe were invited to speak to a panel comprised of Cummins employees as well as professional motorsport racer Chloe Jones.

Alison Trueblood, Executive Director – Europe On-Highway Business, said: “It is so important for us to connect with school children, and hopefully today was just the start of many visits to come. It’s crucial we invest time in this age group and educate them on the real-life STEM opportunities, so we can help to inspire the next generation.”

The event was part of a company-wide initiative to drive gender equality in our communities called Cummins Powers Women (CPW).

By partnering with expert non-profits and leveraging the unique skills and talents of Cummins employees and leaders, CPW has also enabled equal rights and opportunity from almost 946,000 women and girls in 18 countries.

Launched on International Women’s Day in 2018, this community initiative has achieved significant results including 34 gender equality law and policy changes positively impacting the lives of 26 million women and girls around the world.

Amit's award

Recognition for the Darlington engineer inspiring young minds

In addition to being a Science, Technology, Engineering and Maths (STEM) Ambassador, Amit Kumar, based at Cummins' manufacturing plant in Darlington, has been a tremendous advocate for the remarkable work being done by Greenpower Education Trust.

Greenpower is a charity that gets young people enthusiastic about STEM by challenging them to design, build and race an electric car.

Years of dedication to the Greenpower mission, helping to develop the technical content, plus his all-round work as a STEM Ambassador, earned Amit special recognition in the 2022 North East of England STEM Awards.

The judging panel noted that Amit has notched up 121 STEM activities and more than 570 STEM hours over the past five years. Amit supported the Tees Valley Trailblazers enterprise competition at very short notice and has provided numerous online mentoring support for students during the Covid pandemic.

Although he wasn't there to receive his award in person due to customer needs, few people in the room at the Crowne Plaza in Newcastle were unaware of Amit's contribution to opening young minds to the possibilities of engineering as a career path.

"I am very grateful for the award," said



Amit receives his STEM award from Antonio Leitao, Vice President – Off Highway, Engine Business & Europe ABO Leader at Cummins and Owen McAteer, North East Regional Network Lead STEM Learning UK

Amit, "and I am proud that with the support of Cummins and our volunteers, the learning content we helped create can be shared around schools and with teachers across the country, as well as at the Greenpower's Centres of Excellence."

Amit, a chartered engineer, explained that there are two types of Greenpower cars that can be assembled: a basic one for primary schoolchildren and one for secondary

schoolchildren where the frame can accommodate more adjustments, for example with throttle control and gear ratios.

"What I love about the project is that the children so obviously enjoy the work and the teachers love it too. We must be doing

something right because year on year, the number of children taking part is increasing and schools are taking on more and more cars." In fact, Cummins employees have volunteered more than 2,800 hours to support Greenpower

projects with partner schools over the years. "We've had lots of diversity in our teams, and it was wonderful to see a school for children with special education needs taking part recently."

The arrival of the Covid pandemic threw an enormous challenge out to Amit and Greenpower but the project was successfully transitioned online, where students were supported with the project by volunteers using virtual platforms.

Emily Johnson, Corporate Responsibility Director for Cummins Europe, acknowledged the role Amit had played in maintaining Cummins' links with schools in the North East at a most difficult time. "Amit is just a fantastic advocate for STEM," she said. "He's amazing at finding support for schools from a variety of companies, including Cummins." Emily said Amit was a leader of "incredible humility" but also one of the most determined people she knows. "He just doesn't take no for an answer."



What I love about the project is that the children so obviously enjoy the work and the teachers love it too



STEM offers wonderful career path for women

Cummins' pride in mining service technician Alexandra Andersson

Cummins is on a mission to attract more women into the 'nuts and bolts' part of its business – the network of skilled service technicians whose job is to provide the essential back-up for customers across European industry.

It's a challenge that is being readily accepted by Ann-Kristin de Verdier, Executive Managing Director - Distribution Business Europe, who says she has been thinking about the imbalance of men and women in technology for a long time, in fact for the 35 years since she left Chalmers University of Technology.

"Looking back, women made up only 10 to 15 per cent of the students on my course, and the needle has barely moved in fields such as Computer Science which I studied. It's disappointing and frustrating that women, who have so much to offer, are not more involved in helping shape the future careers in STEM (science, technology, engineering and mathematics)."

Ann-Kristin believes career opportunities for women in Cummins' service business have never looked so appealing: "These jobs are well paid, they're secure and they are exciting because they are at the leading edge of energy technology."

"There is also the potential to transition with roles, from being field-based to office-based, technician to analyst to customer-facing role, so the flexibility is there to match the work-life balance that's required."

One young woman who has seized the chance to shine with Cummins is 27-year-old Field Service Technician Alexandra Andersson from Varberg in Sweden.



Alexandra is based at one of Europe's largest open-pit copper mines, near Gallivare in remote northern Sweden, where she is responsible for keeping some of the most powerful machines on the planet in the best working order.

"I just love being around these giant machines – they're so cool," says Alexandra, who as a teenager enjoyed fixing up old cars.

Alexandra studied car mechanics at college and then landed a job in the workshop of a dealership in Halmstad, working on cars and trucks. In her spare time, she helped a colleague prepare his car for racing in the Thunder Car series at weekends.

"I loved working on the V8s but I thought it would be cooler to work on bigger engines. A friend sent me some pictures of wheel loaders and it made me think it would be great to

work in the mining industry, so I started looking for a job and found one being advertised by Cummins."

Alexandra says the only thing she knew about Cummins at the time was that it was the name on the 6.7-litre turbodiesel engine found inside the iconic Dodge RAM pick-up.

Having sailed through her interview and impressed at every stage of her Cummins career to date, Alexandra is now spending a great deal of her time working on the mighty Cummins QSK60. "It's one of the most technically demanding engines in the world to service and I just love it," she said.



With all the digital diagnostics, there's less reliance on physical strength working with engines



"With all the digital diagnostics, there's less reliance on physical strength working with engines, so there really is nothing to stop more women coming into my line of work," says Alexandra.

Ann-Kristin de Verdier says she is proud of Alexandra's stellar progress and agrees there should be more women considering the world of engine servicing as a career. "We have to look more closely at what's working in other industries and other parts of the world. We also need to work out how early we as a business start sowing the seeds."

"When my 11-year-old daughter attended a graduation event, pupils were asked what they wanted to be when they left school. Not one of the girls said anything about wanting to be an engineer."

"We need to be lighting up their thoughts in the early years, and perhaps we can leverage off some of the great work Cummins does in communities and through our long-established grants programme where education is a key driver."

"I want the message to come across to women that wherever they are in their life, Cummins can be there to meet them."

Ann-Kristin believes there are tremendous opportunities to be grasped by women in the transition to Destination Zero.

"We can break the bias by showing that working at the forefront of the energy transition is good for the world and women from all backgrounds can benefit from these opportunities."

Otokar reaches major milestone

Turkish bus and coach giant has installed more than 20,000 Cummins engines

Cummins and Otokar have celebrated a 16-year long partnership which has seen the delivery of more than 20,000 engines for bus and coach applications.

The occasion was marked with the presentation of a celebratory plaque to Otokar from the Cummins team at its engine plant in Darlington, UK.

Since the first installation in 2006, Cummins diesel and natural gas engines have been a mainstay in the majority of Otokar's city and inter-city buses, as well as tourism coaches operating across Türkiye and worldwide.

Approximately 90 per cent of buses produced at Otokar's Sakarya manufacturing facility feature Cummins' Euro VI F2.8, B4.5, B6.7 low-emission diesel or L9N natural gas engines.

Genk Yavuz, Türkiye Territory Manager at Cummins, said: "Since supplying our first engine, the Euro IV ISB4.5 for the Sultan midi-bus in 2006, we have worked in partnership to ensure our products meet Otokar's needs for high performance, reliability, simplicity and easy maintenance.

"As Otokar's business continues to

expand, we look forward to working with them on future projects."

Otokar has led the bus market in Türkiye for the past 13 years with products ranging from 6.6m to 21m length and 46 to 146 passenger capacity.

Cummins power can be found in Otokar's low-emission diesel and ultra-low emission natural gas-powered vehicles including the Kent, Territo/SHD, Vectio/Doruk and Sultan/ Navigo ranges.

Kerem Erman, Otokar's Assistant General Manager, Commercial Vehicles, said: "The Turkish bus market grew 8 percent by units last year and we increased our market share substantially. One out of every two buses sold in Türkiye was Otokar-branded, many of which were Cummins-powered.

"A long-term partnership with our suppliers, reliable aftersales support, spare parts availability and warranty support are very important for us.

"We have a great relationship with Cummins. Cummins is a trusted partner to Otokar and its Euro VI advanced diesel and natural gas engines have been instrumental to our success."

A growing international reputation

Otokar is a major driver of automotive exports from Türkiye. Its public transportation vehicles operate in more than 50 countries, including key European markets France, Italy, Germany and Spain.

Otokar has recently received big orders from Romania and Azerbaijan for its Cummins-powered natural gas Kent C CNG city bus.

In Georgia, the first of 175 Otokar buses ordered by the Municipal Development Fund has arrived. They include the Kent C with Cummins ISB 6.7 engine and the 8.4m low-floor Agilo C, powered by the ISB4.5.

Otokar, a Koç Group company, introduced Türkiye's first hybrid bus and first electric bus to the market.



Centro and F2.8 the perfect match

Otokar recently announced an extension to its product line-up with Centro, its new 6.6m minibus powered by a Cummins F2.8, 107 kW (143 hp) Euro VI engine.

The Centro enables Otokar to compete in the growing premium mini-bus market and reinforces Cummins' position as the leading engine supplier to Türkiye's bus fleets.

The F2.8 provides high performance,

simplicity, compactness and easy maintenance – all beneficial attributes for mini-bus operators.

In addition, the Euro VI engine enables OEMs to deliver on operator requirements for high manoeuvrability in narrow streets, optimised carrying capacity, low operating costs and lower emissions.

DETAILS

For more information visit www.cummins.tech/cummins-magazine2023-f28-euro-vi



All-round winner

- The upgraded Euro VI 2.8-litre F Series delivers exceptional on-road performance and quieter, more refined operation.
- It offers significantly more torque, more fuel-efficiency and all the high-strength credentials of the proven four-cylinder base platform.
- The engine meets stringent Euro VI emissions without the need for exhaust gas recirculation, reducing cooling demands and realising more power potential.
- It also uses the same electronic control module as larger Cummins engines, giving faster processing, larger memory capacity and telematics capability.



New for old

An increasing number of bus operators are turning to Cummins to breathe fresh life into their fleets with like-for-like replacement engines supplied directly from the Darlington factory in the North East of England.

Cummins service agreements offer market-leading levels of service to deliver total cost of ownership (TCO) benefits. All service work is handled from start to finish by a team of expert service technicians, further complemented with significant levels of stock in Euro V and VI engines. The engines are supported by a Cummins extended coverage of up to five years with additional options available.

Replacing a faithful old Cummins engine with a factory-fresh unit delivers improved fleet performance and uptime and reduced service and maintenance costs. Most important, it gives operators peace of mind that the life of their buses will extend for many years, protecting their investment.



▶ DETAILS

Visit our webpage on bus service for more information: www.cummins.tech/cummins-magazine2023-busservice



Versatile power

Q Range of generators fit for ever-changing European market

Cummins Power Generation has introduced a series of low-noise and optimised generators with adaptable power for the European market.

The newest range of CE and UKCA marked generator sets from 17kVA up to 700kVA has been designed with a Fit For Market (FFM) approach to provide a full product portfolio for dealers and key customers.

The first phase of the launch covers the lower end of the power scale, from 17kVA to 66kVA, with the goal of expanding the power range from 90kVA to 550kVA in July 2023.

“The introduction of the new Q Range generators allows us to adapt rapidly to the changing market requirements and bring products more quickly to market, which is a key competitive advantage to succeed in this demanding segment,” said Ignacio Gonzalez Garcia de Quevedo, Executive Director - Industrial Power (Global) and Power Systems (Europe) at Cummins.

“Flexibility is a critical attribute at this end of the market and the Q Range will come with enhanced standard features that include battery charger, starting batteries, battery disconnect and coolant heater.”

Cummins dealers from across Europe had their first experience of the new

Q Range at a special event in Romania (see panel opposite) where Cummins was able to show the true capabilities of the product, and the dealers enjoyed the opportunity to get close to it, touch it and give their feedback.

“The Q Range caters for a wide range of needs and applications and sets the starting line to keep

reinforcing the Cummins product range in the European market,” said Vanesa Ferrari, Industrial Power Marketing Europe.

“Essentially, we have focused on satisfying the needs of our European customers. We have done this by designing products with an improved power density that covers the most critical requirements for this market.

The introduction of the new Q Range generators allows us to adapt rapidly to the changing market requirements and bring products more quickly to market

ALL THE ADVANTAGES



SMALLER AND LIGHTER
Improved power-to-weight ratio with excellent efficiency



SOUND ATTENUATED
Quiet in operation enclosures and fully CE compliant



OPTIMISED SUBSYSTEMS
Very simple to operate and use



EASY TO MAINTAIN
Simpler service means getting the generator back into operation faster, reducing downtime to a minimum.



CUMMINS RELIABILITY
Performance you can depend on even at high altitudes and extreme temperatures. Extended coverage is available on the comprehensive worldwide warranty.

“The whole Q Range is 50Hz with output voltage of 400/230V. All Q Range generators use Cummins engines from different platforms and three-phase Stamford alternators. The control system is also Cummins, providing a simple and reliable operator interface.”

Other features of the range are a bolted frame concept with reduced welding, which avoids welding defects and the risk of leakage, as well as powder-coated and textured paint, rust-free air inlets and polymeric fuel tanks.

Cummins has also focused on improved logistics and lower warehousing costs for customers. Across the range, dimensions have been optimised and weight has been reduced, maximizing efficiency of logistics and handling.

“Availability and improved lead times are at the very centre of the Q Range concept,

Model Name	Voltage (V)	Frequency (Hz)	Standby Ratings		Prime Ratings		Engine Model	Standard Alternator
			kVA	kWe	kVA	kWe		
C17D5Q	400/230	50	16.5	13	15	12	X2.5G2	S0L1-P1
C22D5Q	400/230	50	22	18	20	16	X2.5G2	S0L2-G1
C28D5Q	400/230	50	27.5	22	25	20	X2.5G2	S0L2-M1
C33D5Q	400/230	50	33	26	30	24	X3.3G1	S0L2-P1
C38D5Q	400/230	50	38	30	35	28	X3.3G1	S1L2-J1
C44D5EQ	400/230	50	44	35	40	32	4BTAA3.3-G14	UC 224 C
C55D5EQ	400/230	50	55	44	50	40	4BTAA3.3-G14	UC 224 D
C66D5EQ	400/230	50	66	53	60	48	4BTAA3.3-G14	UC 224 F

and these are at the top of our list of priorities,” said Vanesa Ferrari. “It is for this reason that we not only manufacture the generator set in Europe but we maintain inventory in Europe to minimise lead times. It’s all about fulfilling our customer orders

with faster delivery.”

As with all Cummins Power Generation solutions, the new Q Range is supported by highly trained Cummins sales and service teams that ensures customers are covered no matter where their business takes them.



Q Range comes to life at European dealers event

Cummins dealers from across Europe gathered at the Cummins facility in Bucharest, Romania to experience the new Q Range up close and personal.

During the event, the dealers – around 50 of them – enjoyed the new Q Range product portfolio presentation followed by sessions which focused on PowerCommand GTEC & Acumen and Mission Critical, providing a flavour of the full Cummins Power Generation range.

At the heart of the agenda was a simple message and key take-away for all participants; that the exciting new Q Range, spearheaded by the Industrial Power team, is manufactured in Europe for Europe and designed to meet the market’s most critical needs.

Best-in class dealers and Cummins colleagues were also highlighted in a special recognition session which focused on their drive to excellence.

After an extensive tour of the Cummins Romania facility came the demonstration of the Q Range.

Marius Andrei, Regional Sales Manager – East Europe and Turkey, said: “This important event allowed Cummins dealers to come together and to see the Q Range in action. Feedback on the event and the product itself has been overwhelmingly positive.”

The launch event highlighted the winning factors of the Q Range and its journey to success including flexibility and speed on product enhancements, faster availability of the product range, competitive pricing, a strong sales and support structure and robust channel design.

Industrial Power Marketing Manager Vanesa Ferrari said 2023 would be a critical year in making the Q Range successful, so Cummins was planning regular interactions with its channel partners throughout the year.

“We believe investing quality time together is critical to ensure we make the best out of this product development effort,” she said.

DETAILS
For more information scan the QR code or visit www.cummins.tech/cumminsmagazine2023-qrangegensets



On course for success

Cummins F3.8 helps change the game for greenkeepers

A machine invented in Finland promises to revolutionise the economics of golf course and sports lawn maintenance.

The Turf Gamechanger, fitted with a Stage V 154 hp Cummins F3.8 engine, rolls eight separate worksteps into one action, saving more than 35% of the annual maintenance costs of a typical 18-hole golf course compared to tradition methods and machinery.

Launched in autumn 2021, the Turf Gamechanger is the invention of Ilkka Kaivosoja, who saw that after just one drive, a ready lawn surface could be created, avoiding the need for multiple machines with different drives.

The power required by the different functions of the Turf Gamechanger machine was defined during the initial design. “The power, weight and size of the Cummins F3.8 engine were optimal for our purpose,” said Ilkka Kankkunen, Chief Executive Officer of Turf Gamechanger. In addition, the engine had to meet the strictest environmental standards.

“Turf Gamechanger machines and method are aimed at the international market, and our goal is to change the maintenance practices of sports lawns worldwide,” said Mr Kankkunen.

Given its global ambitions, the comprehensive Cummins maintenance and spare parts networks serving the markets of North America, Europe, Japan and Australia was another big factor in Turf Gamechanger’s decision to partner with the brand.

The engines for the Turf Gamechanger are being supplied via Finnish Machinery Oy.

DETAILS
For more information scan the QR code or visit www.cummins.tech/cumminsmagazine2023-agriculture



How the Turf Gamechanger works

The Turf Gamechanger consists of a multi-purpose pallet whose movable partition enables the storage of two materials at the same time.

While the aerator or vertical mower removes material from the soil, it is sucked directly into the front part of the platform, and the cover material is spread on the lawn from the back part of the platform.

As the work progresses, the partition moves backwards on the platform, freeing up space for waste. In the end, all the covering material has been spread on the lawn and the platform is full of waste. After this, the waste is unloaded and new covering material is loaded onto the pallet.

The Turf Gamechanger’s seven wide wheels, three front axles and four rear axles enable a lower and evenly distributed surface pressure, as well as an even lawn without depressions and grooves.

PERFORMANCE THAT’S ALWAYS CUSTOMER-DRIVEN

Cummins dependable power is backed by our reliable service support to ensure the success of our customers.

Cummins has always been driven to meet customer requirements through its comprehensive, high quality products and services that maximise uptime and deliver the lowest total cost of ownership for our customers.

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EMBRACING OUR PATH TO ZERO EMISSIONS

Climate change is the existential crisis of our time, and we must act today to solve it. Destination Zero™ is our strategy to reach zero emissions and the core of our PLANET 2050 sustainability strategy. It fulfills our mission of powering a more prosperous world.

Cummins is providing the tools and innovations our customers need to charter their own paths to eliminate carbon emissions, including our current powertrain products. We have innovated for our customers for more than 100 years, and we won't stop now.



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