

DEUTZWORLD

ISSUE 2 2019

TECHNOLOGICALLY RECEPTIVE

From diesel to electromobility: DEUTZ focuses on low-emission, future-oriented drive solutions

CHINA

DEUTZ launches joint venture in the world's largest engine market

DIGITALIZATION

Artificial intelligence supports exhaust gas after-treatment

The engine company.



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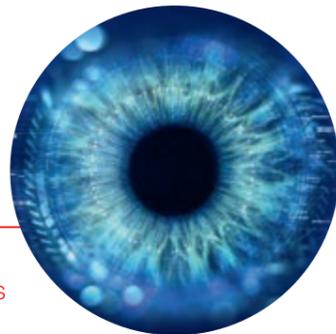


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DEAR READERS,

Rescue or restart: I asked myself this question when I took office as CEO of DEUTZ about two years ago after I got a clear picture of our business situation in China. After in-depth analysis, it became clear to me that we had to rebuild our business in our largest market, from the ground up. That's exactly what we have done. Today, our business in China is focused upon collaboration and partnerships with three locally-based but globally active industry giants: SANY, China's leading construction machinery manufacturer; BEINEI, the engine manufacturer; and FAR EAST HORIZON, China's largest construction machinery rental company. We have defined ambitious goals with all three partners that can take our business in China to new heights (starting on page 12).

With great aspirations, we are also approaching a completely new line of business – the ferry business on rivers and lakes. Why? Major cities from Amsterdam and Paris to Venice and Toronto must curtail air and water pollution. They are in the process of converting their inland waterway transport to electric propulsion systems. Our subsidiary Torqeedo specializes in electric propulsion for boats. Therefore, we are very familiar with this business (from page 10).

Despite the great opportunities that electromobility also offers on water, we are aware of one thing – we cannot rely on electric motors alone – neither on water nor off-highway. Furthermore, electric motors cannot be the only solution to save the global climate

or to position DEUTZ as a future-proof business. That is why we focus on an approach that is open to all types of technology, selecting the best possible drive solution for every individual application. This frame of mind and focus has helped DEUTZ become recognized as one of Germany's TOP 100 most innovative companies, once again. This award makes me very proud, because it shows that as a business, we are on the right track!

I hope you find this issue of our magazine inspiring.

Dr. Frank Hiller

EDITORIAL

IMPRINT

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Note: To simplify readability, gender-specific differentiation is omitted.
Corresponding terms generally imply equal treatment for both genders.

RECEPTIVE TO TECHNOLOGY

PIONEERING THROUGH DIVERSITY: A TECHNOLOGY AGNOSTIC APPROACH IS THE ORDER OF THE DAY IN THE QUEST TO FIND THE BEST DRIVE. THIS ARTICLE EXPLAINS HOW DEUTZ FULFILLS ITS CUSTOMERS' DESIRES FOR THE BEST POSSIBLE COMBINATION OF MAXIMUM POWER, ENVIRONMENTAL AWARENESS, AND AFFORDABILITY WITH ITS MODULAR PRODUCT KIT.

The inquiry from a customer in the construction industry during a conversation on the sidelines of this year's bauma trade show was as clear as it was complex. He was looking for a drive for a telescopic handler. The engine he was looking for had to be able to reliably deliver 75kW in order to meet the demands of daily operation. At the same time, it needed to emit as little CO₂ as possible without making too much noise. And it should still be affordable. Our solution was an E-DEUTZ hybrid system consisting of a TCD 2.2 diesel engine with 55kW output, plus a powerful 20 kW iWFT 1 e-machine. This was not an off-the-shelf offer, but a solution tailor-made to meet the individual requirements of this customer.

By tailoring a bespoke solution, DEUTZ was able to provide an engine that is reliably efficient for any application while meeting the statutory requirements in terms of exhaust and noise emissions – and at a price that would pay off for the customer. Whether with representatives of the construction industry, logistics or agriculture, discussions like this example at bauma are no longer the exception – they are becoming the rule. This is because customers are placing increasing demands on the drives they need for their commercial machines. The key to achieving the perfect balance of technical, ecological and economic goals is not to be fixated on a single drive solution, such as diesel or electromobility. "Open-minded for different technologies" is the catchphrase of the moment. It refers to the willingness and ability to develop solutions that focus on the customer's needs rather than on a specific type of drive. It not only considers the required performance levels, but also the legally prescribed limit values for pollutants and noise. At the same time, the costs for acquisition and operation should be economically feasible for the customer.

“A black and white perspective is neither helpful nor realistic in light of the change in mobility,” says Hartmut Rauen, Deputy Managing Director of VDMA.

That is why DEUTZ is focusing on diversity in its product portfolio. With the initiated change from an exclusive manufacturer of combustion engines, DEUTZ is not confining itself exclusively to the opportunities offered by electromobility, which are currently intensively debated in the commercial vehicle sector. Instead, DEUTZ is pursuing a more agnostic approach in order to meet the diverse requirements of its customers. “It is also our responsibility to contribute to emission-free, future-oriented mobility,” says DEUTZ CEO Dr. Frank Hiller.



Mobility must be thought of holistically – even off the road. Therefore, we are focusing specifically and decisively on alternative drive technologies in the off-road sector.

Dr. Frank Hiller

Specifically, this means that DEUTZ always finds the correct drive system for the customer’s requirements for all scenarios: for logistics, construction or agricultural industries; for applications in heavy or smooth terrain from high mountain ranges to factory buildings; for projects with long or short operating ranges from livestock barns to highway construction sites; for high or low energy requirements; or in regions with strict environmental requirements.

with each other – from electric and gas to hydrogen and hybrid variants. It is also scalable, in any required size. Modular batteries for 360 and 48 V are also available.

“This range distinguishes DEUTZ and makes us fit for the future,” says DEUTZ CEO Dr. Frank Hiller.

We combine pioneering spirit with innovative resources. This allows us to stay one step ahead of the competition.

Dr. Frank Hiller

In other words, we provide the perfect configuration of performance and emission control – and at a reasonable price with effective total cost of ownership, both in terms of acquisition and ongoing operation. This is made possible by the modular DEUTZ Advanced Configurator product kit, developed by DEUTZ. It allows for all drive options and innovative fuels to be optimally combined



QUALITY SEAL FOR INNOVATION

IF YOU WANT TO BE INDEPENDENT FROM SPECIFIC TECHNOLOGIES, YOU HAVE TO DELIVER INNOVATION. DEUTZ RECENTLY DEMONSTRATED HOW WELL IT IS DOING THIS. IN JUNE, THE ENGINE MANUFACTURER WAS HONORED AS A TOP 100 INNOVATOR.



Ranga Yogeshwar, journalist, moderator, and scientist, knows better than any other person how to present modern technologies in an exciting and entertaining fashion. What could be better than choosing him as a mentor for the 26th edition of the TOP 100 innovation competition? Together with Dr. Nikolaus Franke, Chairman of the Institute for Entrepreneurship and Innovation at the Vienna University of Economics and Business Administration, he presented the coveted award to the 100 most innovative companies in Germany. TOP 100 has been on the market for more than 25 years and uses a scientific system to evaluate the innovation management of medium-sized companies.

“On the right track”

DEUTZ is also considered one of the best companies in the country. The business impressed in the category “Innovative Processes and Organization” and scored highly with the DEUTZ Connect App as well as the company’s in-house innovation center. “The award is a great motivation for us,” says Leslie Isabelle Iltgen, Senior Vice President of Communications & Investor Relations, who accepted the award for DEUTZ. “The result shows that we are on the right track with our innovative drives.”

Honored: Leslie Isabelle Iltgen, Senior Vice President Communications & Investor Relations (l.), und Fabio Fischer, Marketing Coordinator (r.), accepted the TOP 100 award from science journalist Ranga Yogeshwar.



ON THE PATH TO ZERO EMISSION

AS SUPPLIERS OF VEHICLES AND MACHINERY, ENGINE MANUFACTURERS PLAY AN IMPORTANT ROLE IN CLIMATE PROTECTION. AN OVERVIEW.

PARTICULATE MATTER

82%

of the world's population is exposed to harmful particulate matter pollution according to the WHO.¹

NO₂
40%

of the urban, traffic-related NO₂ measurements in Germany were above the limit value in 2018.²

CO₂
20%

more CO₂ is emitted by today's road transport than in 1995.³

Eighty-two percent of the world's population is exposed to harmful particulate matter pollution according to the WHO. In addition, the German Federal Environment Agency claims that 40 percent of the urban, traffic-related NO₂ measurements in Germany were above the limit value in 2018. Furthermore, CO₂ emissions from road transport are now 20 percent higher than in 1995. The numbers speak for themselves. For a better climate, mobility must change.

Electromobility on the Rise

The automotive industry is primarily focusing on the advancement of electromobility. In the USA and China in particular, the corresponding markets have grown enormously over the past year. Each country experienced growth of around 80 percent, but Europe also showed growth of 76 percent, which illustrates how much potential electric motors currently have. The German

Engineering Federation (VDMA) expects equal demand for electric and conventional drives as early as 2023. Many manufacturers are therefore investing heavily in the advancement of electric motors and battery technologies. The government is also providing stimuli, especially for the expansion of the charging infrastructure. The result is steadily increasing acceptance due to improved technology and falling prices, but also because of the worsening climate crisis.

The Challenge of Complexity

The good news is that it is already possible to equip commercial vehicles with purely electric drives or plug-in hybrid drives without any problems. However, occasionally higher complexity engines and adverse operating conditions such as high temperatures, strong vibrations, heavy shocks, high loads, or dusty tracks make it difficult to ensure

the required reliability and service life. Engine manufacturers are tasked to develop the optimum drive for every situation, for example through diversified system approaches, a modular product strategy and a roadmap without limitation to specific technologies. All this has to happen without losing sight of sustainability requirements.

From Electric to Power-to-X

To make this complex field of innovation more tangible, engineers are increasingly talking about "Power-to-X" technologies. The objective is to convert electricity from renewable sources into other forms of energy and store it in this way. In some cases, this even produces conventional, but synthetic and thus non-fossil fuels. This method can be particularly useful for applications in which direct electrification is not yet foreseeable or beneficial. For example, conversion of green energy into thermal or chemical energy makes high-temperature industrial processes or air traffic much more resource-efficient.

The array of drive technologies for tomorrow's mobility is greater than many think. Synthetic fuels from renewable energies offer completely new possibilities.

Hartmut Rauen, CEO of VDMA

Nobody right now knows which technological solutions will ultimately prevail. However, one thing is clear: engine manufacturers, as innovative solution providers, hold the key. And a substantial business in combustion engines will remain – for example, there is no alternative for heavy commercial vehicles in the foreseeable future. The developmental focus here is on continuously increasing efficiency, and that contributes to several goals at once: less noise, lower operating costs, and less air pollution.

Sources:

¹WHO "Global Ambient Air Quality Database" (2018).

²German Federal Environment Agency "Air quality 2018 – preliminary evaluation" (2019).

³German Federal Environment Agency "Emissions from transport" (2019).

WITH TORQEEDO, DEUTZ SETS COURSE FOR COMMERCIAL SHIPPING

MAJOR CITIES AROUND THE WORLD ARE FACED WITH THE CHALLENGE OF KEEPING THE AIR AS EMISSION-FREE AS POSSIBLE – ON LAND AS WELL AS ON WATERWAYS. THIS ARTICLE EXPLAINS HOW THE DEUTZ SUBSIDIARY TORQEEDO SUPPORTS THEM IN THIS ENDEAVOR.



Torqueedo at a Glance

Founded in 2005, DEUTZ subsidiary Torqueedo is now active in more than 50 countries and has so far sold more than 80,000 systems with an output of up to 100 kW. With a portfolio of 120 patents, the company is considered a technology leader and, with 200 employees, it is the largest company in the field of marine electromobility. Torqueedo has been part of the DEUTZ Group since 2017.



A boat trip on the Rideau Canal is one of the highlights of a visit to the Canadian capital Ottawa. Anyone who climbs on board the Queen Elizabeth is also making their sight-seeing trip particularly environmentally friendly. The 98-passenger ferry is powered by an emission-neutral electric motor from DEUTZ subsidiary Torqueedo. Passenger transport on



CO₂-neutral sightseeing in Ottawa, Canada

the Mar Menor, a saltwater lagoon in the Spanish region of Murcia, is also emission-free. The 18 m-long ferry Ecocat is 100 percent fueled with solar energy. The drive consists of two Torqueedo Deep Blue electric motors; an additional combustion engine is superfluous.

Customers on Board

A recent customer event gave DEUTZ the ideal opportunity to demonstrate its competence in the field of electric drives. Under the motto Green Solutions, DEUTZ presented two electrically-powered boats together with its distribution partner DPS Power. The event took place during the Dutch national holiday Koningsdag (King's Day) on April 27, 2019 in Amsterdam. Both boats were equipped with powerful Deep Blue systems from Torqueedo.

Emission-Free Waterways

Fleet operators and authorities around the world are increasingly relying on environmentally friendly technologies to reduce exhaust gases and therefore air and water pollution. Excursion boats and ferries are a particularly interesting market for suppliers of electric drives. The ships travel manageable distances and can recharge their batteries at any time.

At the beginning of May (2019), the Electric Days on Lake Starnberg also focused on the wide range of electromobility on water. Journalists, customers and partners from all over the world were invited. "The emission requirements for roads will also apply to rivers, canals and lakes soon," says Christoph Ballin, CEO and co-founder of Torqueedo. "That's why we will also experience a boom in electromobility in the ship segment."



Quiet as a Whisper – Like a Sail: At the Electric Days in May at Lake Starnberg, Torqueedo made emission-free mobility of the future a real-life experience.



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COLLABORATIONS WITH EXPERTISE

ONE HUGE MARKET, THREE STRONG PARTNERS: IN THE FUTURE, DEUTZ WILL FOCUS ON STRATEGIC SUPPORT – AND ITS OWN STRENGTH – IN CHINA.

It is an important milestone: DEUTZ and the Chinese mechanical engineering company SANY have signed a joint venture agreement. DEUTZ holds 51 percent of the shares and takes over local engine production.

UP TO 5 %

market growth in the construction machinery division

UP TO 10 %

market growth in the area of material handling

20.000

engines until 2022

The conclusion of the contract is highly symbolic. After all, it is the starting signal for a new start for DEUTZ in China – combined with a clear strategic shift. In spite of recently lower growth, analysts expect market expansion of up to five percent in the Chinese construction machinery segment in 2019 and up to 10 percent in material handling. In order to exploit the continuing potential of the Chinese market to the fullest, DEUTZ will be relying on the strength of collaboration. In addition to the joint venture with SANY, DEUTZ also cooperates with the engine manufacturer BEINEI and China's largest construction machinery rental company, FAR EAST HORIZON.

“We certainly could've set up a wholly-owned DEUTZ subsidiary,” explains DEUTZ CEO Dr. Frank Hiller. However, this option would have a decisive disadvantage for the CEO:

“Our goal is to operate closely to the customer in the Chinese market as well. To accomplish this, we rely on local expertise, but supplement it with our own technological expertise, for example in electrification.”

The reason for this turnaround is DEUTZ's previous experience in China. In 1996, the Cologne-based

company merged with the manufacturer FAW to capture the markets in the Far East that had just opened up. However, this presented an unforeseen issue. The Chinese company continued to produce its own engines, which competed with those of the DEUTZ collaboration. To consolidate the two businesses, DEUTZ canceled its contract in 2018 to restructure the Chinese business from the ground up.



So why set up a new collaboration? DEUTZ is now relying on partners who have expressly positioned themselves internationally in recent years. For example, together with the engine manufacturer BEINEI, joint engine production is expected to start in 2020 under the direction of DEUTZ management – in a new factory in Tianjin, which will produce a total of 20,000 engines for the Chinese market by 2022. With the

support of the construction machinery rental company FAR EAST HORIZON, DEUTZ intends to expand its service business quickly and significantly. DEUTZ customers will also be served at more than 80 HORIZON locations in the future.

“China is now the largest as well as the most exciting market for engines in the world,”

reveals DEUTZ CEO Dr. Frank Hiller. “Only a few people in Germany are aware of the companies that are successful there. Naturally, we also want to win everyone over in this market environment with our claim to build the world's most modern and sustainable drive systems.”

Hiller does not consider the fact that China is tightening its emission standards a problem, but rather a great opportunity. “The introduction of the China-IV standard is perfect timing for us. Many Chinese companies are still having a hard time with it – this is where we can contribute our technological expertise. It offers enormous potential.”



POWER FOR THE BISON

FROM THE EXCAVATION PIT TO TARMAC: DEUTZ ENGINES MOVE VEHICLES AND MACHINES WORLDWIDE. IN OUR NEW SERIES, WE PRESENT EXCEPTIONAL DEPLOYMENT LOCATIONS FOR OUR DRIVES. PART 1: DEUTZ AT AIRPORTS.

The ramp agent at the gate gives the captain the green light in the cockpit via radio. The plane will take off in a few minutes. The flight captain starts the engines of the passenger aircraft, but even the strong engines would not get the colossus structure off the ground without support. To reach the correct take-off position, the aircraft is dependent on a Bison 1000 from Goldhofer. The aircraft tractor of the heavy transport specialist from Memmingen docks at the nose wheel of the aircraft and sets it in motion. The tractor pulls the aircraft towards the runway – the rest of the journey is handled by the aircraft with its own thrust.

Engines meet exhaust emission level V

The same holds true for the trip from the parking position to the runway, for the distance between two gates and for the journey to the maintenance facility. Special vehicles are required whenever aircraft with a take-off weight between 400 and 600 metric tons have to cover distances on the airport grounds or if baggage has to be transported from the belly of the aircraft to the gate. It requires aircraft, freight, or baggage tractors from manufacturers such as Mulag, Trepel, or Goldhofer, with whom DEUTZ has been working for many years. And for

special vehicles, DEUTZ provides a custom-fit diesel unit that has enough power for these demanding tasks. “The products as well as the reliable cooperation were the reasons why we decided to work with DEUTZ,” reports Lothar Holder, Airport Technology Executive at Goldhofer. Their vehicles are equipped with engines of the DEUTZ series 2.9, 3.6, 4.1, 7.8 and 12.0 V6. The engines not only impress with their power and low fuel consumption, but in some cases also meet the new exhaust emission standard V, which went into force throughout Europe on January 1, 2019. Machines that

meet exhaust emission level V emit 90 percent fewer soot particles and nitrogen oxides. DEUTZ is the first engine manufacturer in the world to receive a certificate for EU Level V.

Bison in continuous operation

The plane is now ready to take off. There is still a lot of activity at the terminal. Goldhofer's Bison is already taxiing to the next deployment, where a ramp agent is expecting the special vehicle for the next tow. After all, other airlines want to be towed to the tarmac. The special vehicle is in continuous operation from early morning until late at night – with DEUTZ Power.

EMISSION LIMITS ARE BECOMING INCREASINGLY DEMANDING, AND DRIVE SYSTEMS MUST BECOME MORE EFFICIENT. IN ORDER TO MEET BOTH REQUIREMENTS WITH ITS DRIVES, DEUTZ RELIES ON ARTIFICIAL INTELLIGENCE.

MORE EFFICIENT DRIVES

THANKS TO ARTIFICIAL INTELLIGENCE

Oil-smeared workbench? Environment fogged up by exhaust fumes? Not at all! When Volker Smits examines the behavior of an engine, it is usually a clean affair for him. Smits is a software developer and works with mathematical models that he optimizes step-by-step on his computer. For example, such models are used to map emissions of soot or nitrogen oxide in order to later adjust the exhaust gas after-treatment of drives to the respective, increasingly stringent limit values.

Adaptive emission model

In the form of so-called artificial neural networks and evolutionary algorithms, artificial intelligence ensures that these mathematical models match up with reality. The models undergo certain learning processes over and over again and are gradually improved. Smits already programmed such models during his studies before he joined DEUTZ three years ago to apply this method to the calculation of emissions. "There was already an emissions model, but we were not satisfied with the quality," reports Smits. "That's why we wanted to improve it."

Therefore, the developers generated a data set that, among other things, takes into account the engine design data and the thermodynamic properties of the fuels – in other words, data that influences the emissions behavior of the engine. In the next step, the developers used the data for an AI algorithm, which constructed a mathematical model of reality from it. Over several hundred runs, the software calculated an authentic image of the emissions output from the corresponding drives.

Real-time post-processing

This is invaluable for exhaust gas after-treatment. Why? If the control unit of a drive is equipped with such an authentic data model, the engine can call up its emission behavior at any time without physical sensors and adjust the post-processing in real time. The fast and high learning ability of AI is a great advantage when creating such data-based models. These models have been refined several times by algorithms, making it possible for them to represent laws that would be too complex for a conventional or physical model. For example, they can virtualize the realistic development of soot, and demonstrate how much stress soot particles place on the installed filters in a certain situation.

This allows DEUTZ engineers to optimize these filters and ultimately design more efficient drives. "The newly developed model is very powerful and also suitable for demanding emission targets," says Smits. "The limit values are in compliance, and the engines produce significantly lower emissions thanks to numerous optimizations made by the engineers." This is also demonstrated by the ongoing digitalization of DEUTZ and the increasing complexity of modern drive systems. "Development in this area is becoming increasingly demanding, and the electronics sector is becoming increasingly



important. Of course, this also applies to artificial intelligence in the most diverse areas."

Preventing errors and problems

The emissions model is one of several AI projects by DEUTZ in which evolutionary algorithms are used. For example, they help identify parameters of purely physical models, for example, for mapping air paths or for simulating catalytic converters in exhaust gas after-treatment. Artificial neural networks, on the other hand, are used in predictive maintenance. "This allows us to predict operational errors based on measurement and production data from the drive," says Smits. "In this area AI also ensures that drives run more efficiently."

SAY GOODBYE TO MANUALS



FASTER RESPONSE, LESS DOWNTIME, LOWER COSTS: HOW DEUTZ OPTIMIZES ITS SERVICE WITH DIGITAL TOOLS.

If the engine does not run as intended, a look at the tablet will help. It provides the technicians with a three-dimensional overview of the most important components of the drive and also provides an initial orientation for correcting the error. Does the belt drive require maintenance? Is there enough coolant? Or is it time to change the lubricating oil or the corresponding filter?

Actually, the V-belt is worn out and needs to be replaced. With a few more clicks on the tablet, the correct spare part can be ordered in no time at all. And instead of having to struggle reading through up to 500 pages of workshop manuals, the mechanic can quickly and easily view all the relevant work steps in a compact video or step-by-step instructions.

Workflows for mechanics can be significantly streamlined, response times significantly increased and performance improved. As demonstrated at the bauma construction machinery trade show in April 2019, the new Augmented Reality application DEUTZ Live Repair delivers this – the service of the future.

“The use of state-of-the-art hardware and software systems in service offers enormous potential for all customer groups.”

confirms Andreas Schmidt, Senior Vice President, Central Service at DEUTZ.

„All beneficiaries are involved in the value chain: from machine manufacturers and service partners to workshops and fleet operators, all the way to end customers.“

The goal is clear: All customer groups – from manufacturers to operators – must receive an outstanding customer service experience. DEUTZ will ensure best-in-class parts availability, expand its global service network with

new partners and grow its own service centers, in addition to continuously expanding its range of service solutions. In the meantime, “analog” products such as extended warranties, extended oil change intervals and repair kits tailored precisely to the engine, are becoming increasingly important, as are other digital services. From online documentation of engine and service information, or transmission of engine data and the associated derivation of preventive service measures, to management of entire machine fleets, the range of digital after-sales services is enormous and will continue to grow.

“By improving usability, DEUTZ helps our customers to reduce downtime and better manage maintenance and repair costs.”

says Dr. Matthias Szupories, SVP Central Sales & Marketing at DEUTZ. “Confirmed work is automatically transmitted to the engine history and is then available to the user at any time.”

SERVICE IN THE MIDDLE EAST

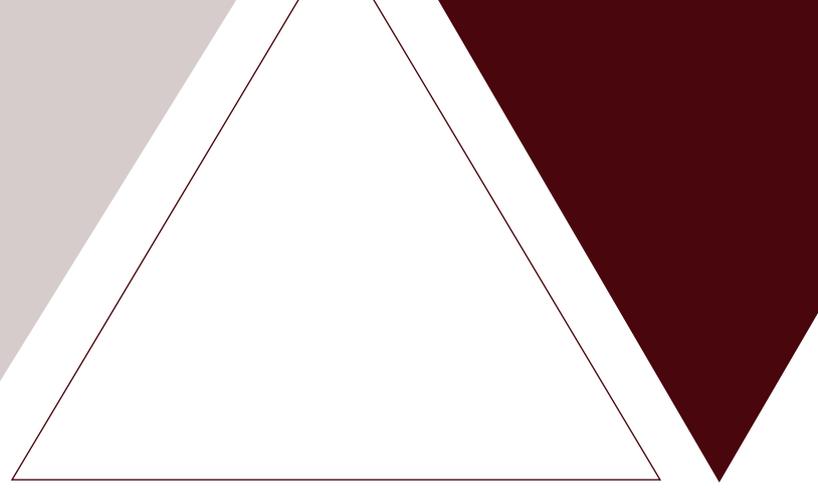
DEUTZ IS FORGING AHEAD WITH THE EXPANSION AND DIGITALIZATION OF ITS SERVICE BUSINESS IN STRATEGICALLY IMPORTANT REGIONS.

In the Middle East, the focus will initially be on Egypt, the Gulf States, and Turkey. “The expansion and digitalization of our service activities are a key component of our growth strategy,” explains DEUTZ executive Michael Wellenzohn. “The regional realignment will enable us to serve demand for our products and services in a more targeted manner in the future. This will make our operations processes much more efficient and will significantly improve the performance of the entire service business.”

Dr. Matthias Szupories, SVP Central Sales & Marketing at DEUTZ, says that a strong partner with headquarters

in Bahrain will assume responsibility as the main importer in several Gulf states. “The local parts and service activities will be expanded and controlled from here. Up to 20 support bases will be attached locally, including renowned partners who will take over the sale of new engines and thus ensure efficient growth.”

DEUTZ is also opening one of the first web shops for industrial products in the Gulf States. In Turkey, the Cologne-based group will cooperate with two retailers and in northern Anglo-Saxon Africa it will focus on a partner based in Egypt.



NICOLAUS AUGUST OTTO AWARD

INNOVATIVE IDEAS SHAPE OUR FUTURE

The Nicolaus August Otto Award honors outstanding lifetime achievements in the field of innovative ideas that have shaped the future.

AWARD CEREMONY

12 September | 10-5 PM | Cologne