

DEUTZ^{WORLD}

Edition 3 | 2017

The customer magazine of DEUTZ AG



Fast-forwarding e-competence

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Agritechnica 2017

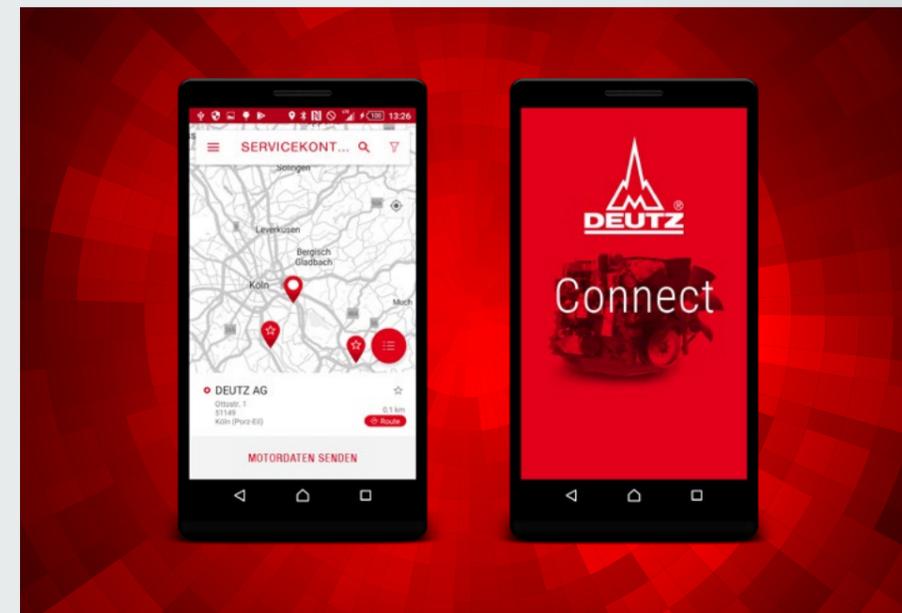
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Dear readers,

We recently told you about our acquisition of Torqeedo GmbH, the pioneering global market leader in the field of marine electromobility. This acquisition allows DEUTZ to leverage the opportunities arising from the rapid developments in the market for alternative drives. Our existing range of innovative drive systems will be supplemented by the E-DEUTZ strategy, which focuses on the development and production of hybrid and electrified drives for off-highway applications. In our feature article starting on page 6, Dr Frank Hiller (CEO of DEUTZ) and Dr Christoph Ballin (CEO of Torqeedo) discuss DEUTZ' future position as a market leader for innovative drive systems in the off-highway segment and grant an insight into the pioneering solutions the company is developing already.

DEUTZ is taking a first step towards partial electrification with its mild-hybrid drive system based on a compact diesel engine. The goal behind this 48-volt hybrid model is to downsize the diesel engine by adding a supporting e-machine. Turn to page 10 to find out what benefits our customers derive from this innovative system – saving fuel is just one of them. You can also get an idea of our E-DEUTZ strategy for electric drive solutions in person: between 12 and 18 November, DEUTZ will be operating a booth at Agritechnica in Hanover, the world's largest agricultural exhibition. Visitors to our booth will get an exclusive look at our Stage-V-certified engine range, which has been awarded the world's first Stage-V certificate by the Federal Motor Vehicle Transport Authority (page 14), and our new in-line engines with a cubic capacity of 9–18 litres, which will expand the output range of our engines to 620 kW (page 16). This issue of DEUTZWorld also focuses on: "DEUTZ Connect" – the new app for mobile engine diagnostics. Our report on page 18 will tell you all about the benefits our versatile service tool offers our customers.

We care about our customers. The increasing technical complexity of the engine business requires us to stay in ever closer



contact with them, so we have carried out another strategic acquisition. By acquiring our long-standing Italian sales and service partner IML Motori, we have invested in our international growth and the expansion of the profitable service business. Read our article on page 20 to find out about the favourable synergies generated by the close partnership of DEUTZ and its Italian subsidiary.

DEUTZ is a reliable partner to its customers – the global popularity of our engines proves it. When the Indonesian government decided to expand its existing electricity network, they soon found an excellent partner in DEUTZ. Turn to page 22 for an exciting story about newly built bridges, coconut trees and tricky transport routes for our units.

We hope you enjoy reading this issue!

Your DEUTZWorld editorial team

Note: Gender differentiation has not been applied in this document for reasons of improved legibility. The relevant terms apply for both genders in the sense of equal treatment.

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DYNAMIC BEST POINT CONTROL



„Dynamic Best Point Control“

DEUTZ presents its “Dynamic Best Point Control” software solution at Agritechnica. The software, which was developed in partnership with the Danish company Danfoss, improves the availability of the diesel engine/hydraulic pump system and achieves fuel savings of more than 20%.

DEUTZ invests in the digitalisation: meet the new online service portal with an integrated parts shop

Together with its distributors, DEUTZ is launching a service portal for garages, consumers and machine operators. As of now, customers can access all information about the DEUTZ service range at www.deutz-serviceportal.com, where they can also order DEUTZ Original spare and service parts from local distributors – open 24/7. The launch of the new portal follows a successful testing period carried out with a pilot partner.

A wide range of spare parts for DEUTZ engines is available online, but finding the right part is a challenging task. The DEUTZ service portal is the only tool that lets you identify all suitable spare parts with abso-

lute certainty. It grants users direct access to the documentation of more than 1.5 million DEUTZ engines and the current status of technical modifications. A list of suitable spare parts is available for every single engine number. The service portal combines the advantages of the worldwide web – unlimited access around the clock – with the strengths of competent on-site service: support, service and delivery remain the responsibility of the customer's local DEUTZ partner. This minimises delivery times and guarantees the best possible support. Indispensable for corporate customers: Individual pricing conditions are stored in the shop, and delivery times are determined in real time

New e-learning module in the field of service available from December

After the successful launch of our web-based learning management system, we are now successively expanding our service learning modules. From December 2017, the new learning module for all e-learning users in the field of service will be launched. The new learning module exclusively deals with the topic of SERPIC. The training course teaches the basics of SERPIC alongside in-depth tips and tricks. It is intended for new employees and long-term users alike. If you do not yet have access and are interested in the learning management system, please contact elarning.service@deutz.com.



DEUTZ welcomes its new trainees



On 1 September 2017, two women and 18 men started their vocational training at DEUTZ AG in Cologne-Porz. During the induction days, Dr Margarete Haase, Member of the Management Board at DEUTZ AG, personally welcomed the new trainees to the company: “Today, you are starting a new stage of your life. I am very pleased that you have chosen DEUTZ AG as the environment in which your professional future will flourish.”

Training at DEUTZ AG traditionally starts with the induction days, which are organised by second-year trainees. At the Technikum, these seniors share important information about their employer with the newcomers. Personal exchange and get-

ting to know the company are the main purposes of the induction period, and the experienced DEUTZ trainees help the “newbies” out wherever they can.

The new cohort of trainees in Cologne consists of two electronics engineers, two warehouse specialists, two metal technicians with a specialisation in assembly technology, three metal technicians with a specialisation in machining, and three mechatronics engineers. These future professionals will be supporting the production of DEUTZ compact engines in Cologne. Frank Opitz, Director of the training centre in Cologne: “We are very pleased to have filled all our training positions with promising, motivated young people again this

year. We, the staff at DEUTZ, benefit from the in-house traineeship program just as much as the trainees. They get high-quality training and we secure skilled professionals for our production plants.”

DEUTZ trains its junior talents in seven different professions and also carries out initial vocational training on behalf of many of its partners.

At the Ulm site, four industrial mechanics and mechatronics engineer started their careers. On 1 August, two machining engineers started their training at the components facility in Herschbach.

in the DEUTZ service network based on actual availability. But the new Service Portal is more than just a web shop: it also offers customers a wide range of functions and contents related to DEUTZ engines. With one central login, customers receive access to spare parts, engine documents, product information and more.

Michael Wellenzohn, Member of the Board for Distribution/Marketing and Service at DEUTZ AG, adds: “The new service portal is a logical continuation of our growth strategy in the fields of service and digitalisation. It gives our customers a modern, future-oriented online platform that simplifies and accelerates their access to DEUTZ Service.”

The global launch will take place in several stages. Starting in Europe, the regional DEUTZ Service partners will be connected to the system successively. On the occasion of the launch, customers will benefit from attractive introductory offers from participating service partners.

Experience the new DEUTZ Service at www.deutz-serviceportal.com

A makeover for the DEUTZ website

The DEUTZ AG website is sporting a new look: visit www.deutz.com to experience the new, modern online presence of our company – designed with its target audience in mind. From the latest technologies and products down to current media information, financial publications and a comprehensive sales and service network, the new pages offer a wide range of content. It is optimised for regular computers and mobile devices thanks to its so-called “responsive design”. The website automatically detects the screen size of the device from which it is being accessed and adapts the content accordingly. The technical foundation of the site was upgraded to the latest standard in the fields of security, performance and user-friendliness. Across all departments, the website content was updated and adjusted to customer requirements. During the next step, the websites of the DEUTZ subsidiaries will be moved to the new platform to ensure a uniform corporate appearance throughout the group.



DEUTZ Service Portal takes the DEUTZ service network online

Fast-forwarding e-competence

E DEUTZ

Diesel engines are still major players in the off-highway segment, but they are getting some help. Within the scope of its e-strategy, DEUTZ is acquiring the electric specialist Torqeedo and kick-starting the electrification of its engine range.

Hybrid and fully electric drive systems have become well established in many fields of mobility. They are only useful, however, if the mass to be moved is relatively small and the necessary infrastructure is in place. These requirements are rarely met in the off-highway segment. Heavy-load agricultural and construction machines usually operate outside of urban areas, or they are used to build urban infrastructure in the first place. The number of marketable solutions is correspondingly small. With its e-DEUTZ strategy, DEUTZ is kick-starting the development of technically sophisticated, economical electrification solutions.

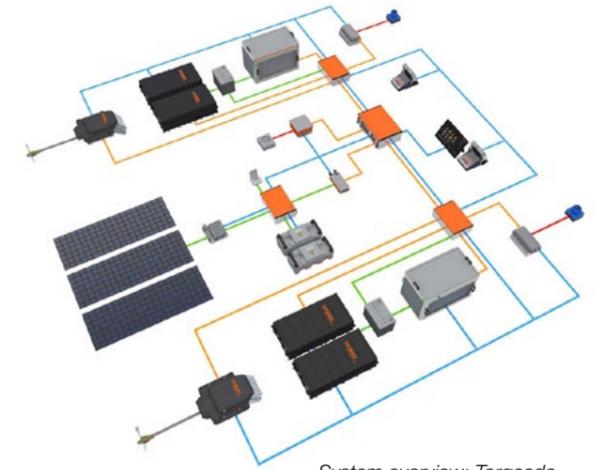
To support this goal, the company acquired the Munich-based Torqeedo GmbH on 27 September. Founded 12 years ago and currently active in more than 50 countries on five continents, the company has considerable competences in components, software and systems integration for electric drives. Torqeedo is the global market leader and systems solution specialist for integrated electrical and hybrid boat drives. Its performance bandwidth ranges from 0.5 to the equivalent of 119 kW (to be introduced) for leisure and commercial applications. In this context, "equivalent" describes a unit that generates the same propulsive power as an outboard petrol engine with the corresponding number of kW, although the shaft and input power of the electric outboard engine can be lower.

Torqeedo products are distinguished by their uncompromisingly high-tech design, top efficiency and complete system integration.

The acquisition of Torqeedo allows DEUTZ to fast-forward its e-competence generation process in comparison to a standalone solution. This is an important competitive advantage considering the dynamic nature of the market. By accelerating the launch, Torqeedo is the foundation for an intelligent transfer of technology. The acquisition also gives DEUTZ access to all important e-components, especially lithium-based batteries as an energy source. They store considerably more energy than other batteries, withstand high currents – a significant advantage of electric drives –, remain reliable in cold temperatures and have no memory effect.

DEUTZ sees the main potential of this technology in the opportunity to downsize combustion engines, thus reducing their fuel consumption. Smaller engines can generate more power as a hybrid system with the support of an electric engine. The goal of this innovative development is a tangible reduction of operating costs for DEUTZ customers and a sustainable contribution to environmental protection by lowering

emissions. DEUTZ is thus effectively completing its modular technology kit for the reduction of emissions, including CO₂. For applications of a smaller scale, fully electrified applications are a distinct possibility. DEUTZ consolidates Torqeedo as of 1 October 2017. The acquisition is financed with available liquid assets. In the following interview with DEUTZWorld, Dr Frank Hiller (Chief Executive Officer of DEUTZ AG) and Dr Christoph Ballin (Founder and CEO of Torqeedo GmbH) explain their future partnership and their plans for positioning DEUTZ as the market leader for innovative drive systems in the off-highway segment.



System overview: Torqeedo is a systems solution specialist for integrated electrical and hybrid boat drives.



In dialogue: Dr Frank Hiller
and Dr Christoph Ballin



Dr Frank Hiller, Chief Executive
Officer of DEUTZ AG.



Dr Christoph Ballin, Founder
and CEO of Torqeedo GmbH.

DEUTZWorld: Dr Hiller, DEUTZ is kick-starting its electrification project with its acquisition of Torqeedo. What is the defining feature of the new E-DEUTZ strategy?

Dr Hiller: DEUTZ is now taking the next logical step to further its role as a technological leader in the development of environmentally friendly, efficient diesel engines: we are expanding our product range to include hybrid and fully electric drives. The acquisition of Torqeedo has given us access to 12 years of practical experience and state-of-the-art expertise in the field of electric drives. It allows us to accelerate the market launch of our electric drives in the DEUTZ key segments and aim for market leadership in the segment of innovative off-highway drive systems.

DEUTZWorld: How do you assess the market opportunities for electrified off-highway applications in the DEUTZ core business?

Dr Hiller: The vast majority of customers are currently engaging with the topic of electrification to some extent. Auxiliary drives will soon be electric – think of sower units in tractors, for instance. Without the need for mechanical transmission, we get increased efficiency. Thanks to the decreasing cost of electric parts and, in particular, batteries, hybrid drives will be technically feasible and economically reasonable in a lot of cases. The reduced fuel

consumption will decrease the total cost of ownership and improve CO₂ emissions. For applications with low power requirements, we are optimistic about the use of fully electrified engines based on modern lithium-ion batteries. And there are more aspects worth considering: noise emission in cities, for instance.

At the same time, I would like to emphasise that our clean diesel engines will be indispensable for many years to come. Their high output is necessary for off-highway applications. Our E-DEUTZ strategy does not affect our commitment to diesel engines in any way. Instead, we are supplementing our product portfolio in order to offer our customers the drives that are most reasonable for their particular application and load profile.

DEUTZWorld: Dr Ballin, which applications are best suited for future E-DEUTZ drives?

Dr Ballin: DEUTZ supplies engines for a wide range of machines that have wildly different requirements. The suitability of hybrid and fully electrified drives crucially depends on their application and the resulting load profile. We are confident that our electric drives will be excellently suited for applications in low- and medium-output ranges with fluctuating power requirements or a minimal load profile. As part of a

hybrid unit, electric drives can support the combustion engine by providing additional energy during peaks. During idle phases, the electric engine – which also functions as a generator – can recharge the battery. Fully electric drives can be used for low-output applications, such as forklifts.

DEUTZWorld: Dr Hiller, when will the first electrified DEUTZ engines enter serial production?

Dr Hiller: Our plan is to launch the first products from our E-DEUTZ strategy in around two years. We assume that we will be generating five to ten per cent of our revenue with hybrid or fully electrified drives in five years. Of course, the E-DEUTZ strategy is also based on the wishes of our customers who would like to use an electrified drive. This is why we will soon be starting serial development together with our partners.

DEUTZWorld: How do you plan to carry out the technology transfer from electric boat drives to electrified off-highway applications in DEUTZ' current core business?

Dr Hiller: We consider Torqeedo as an innovative catalyst of the E-DEUTZ strategy. We use the design, integration and systems expertise and experience of our new colleagues in all areas: our joint development processes, field experience, the e-technology supplier network, et

cetera. This will considerably accelerate the market launch of electrified DEUTZ off-highway drives.

DEUTZWorld: Will DEUTZ be establishing new "e-competence" at its existing sites, too?

Dr Hiller: We are investing around EUR 100 million in our E-DEUTZ strategy, which includes the acquisition of Torqeedo. We will be establishing resources in the field of e-technology at both DEUTZ and Torqeedo. Building competences together with Torqeedo is a faster, less risky approach than going it alone. Ultimately, this step will strengthen DEUTZ for the future and, in turn, safeguard existing jobs.

DEUTZWorld: Dr Ballin, you have called Torqeedo a "Tesla for the water". What sets your products apart?

Dr Ballin: When we founded our company twelve years ago, there were no technologically advanced electric engines in the marine segment. We took advantage of this situation and developed the first high-grade, marketable boat drives. E-mobility is our way of life. We are convinced of our products and their performance. Our hybrids and fully electric drives boast a great performance, excellent efficiency and low noise emissions. These qualities have made us the market leader in the field of marine electromobility.

DEUTZWorld: How will Torqeedo develop as a brand?

Dr Ballin: Having entered the market as a start-up business, we have now reached a point where we can be more successful with a strong partner. We have sold more than 70,000 drive system and are clearly the number one on the market. The same goes for our market presence: we are represented in more than 50 countries and export 75 per cent of our products. Our partnership with DEUTZ will allow us to reduce purchasing and manufacturing costs while magnifying synergies in sales and service. We will be able to take full advantage of our potential and keep growing. Beyond that, we are pleased to apply our technology to off-highway drives and assume a pioneering role in the field of e-mobility together with DEUTZ.

DEUTZWorld: Dr Hiller, what is your opinion about the brand Torqeedo, and how will Dr Ballin and Dr Plieninger support the DEUTZ Group in the future?

Dr Hiller: Torqeedo is the uncontested market leader in the field of electric boat drives. The company owns a strong, fully established brand in this segment and will be continuing its successful growth trajectory under the name of Torqeedo. Dr Christoph Ballin and Herr Dr Ralf Plieninger will continue their management of Torqeedo. In addition, they will be appointed Head of Strategy and Head of Electrification, respectively, at DEUTZ AG and assume additional tasks in the top management of the company. They will actively shape the operative business of both Torqeedo and DEUTZ. I am greatly looking forward to working with them personally.

DEUTZWorld: How will the E-DEUTZ strategy change the product range, and what can DEUTZ customers expect in the future?

Dr Hiller: Our goal is to position DEUTZ as the market leader in the field of innovative drive systems. In addition to our established products, we will be offering our customers hybrid and fully electric solutions. By combining our own competences with Torqeedo's expertise in the field of electric drives, battery management, performance electronics and system integration, we are ahead of the competition and optimistic about our chance on the market. Our customers can look forward to a considerably broader product range with a clear commitment to electrification.

DEUTZ launches the pre-development stage of a mild hybrid drive system with a 48-volt hybrid based on the compact TCD 2.9 and 3.6 diesel engines. The company aims to downsize the drive systems using a combustion engine plus an e-machine. This saves fuel and generates additional benefits for customers.

HYBRID

The DEUTZ 48-volt hybrid

Smaller, stronger, more efficient

Hybrid drives, i.e. units combining a combustion and an electric engine, come in different degrees of hybridisation. In a full hybrid drive, driving is powered fully by the e-machine. In a mild hybrid, the e-drive supports the combustion engine to achieve greater efficiency. The underlying principle is simple: DEUTZ replaces the regular alternator with a powerful e-drive that simultaneously functions as a generator. The belt mechanically integrates the e-machine into the transmission system of the drive. Alternatively, it can be integrated as a flywheel generator or auxiliary drive (PTO). When the diesel is in the partial-load range, the e-machine leverages this power by increasing the load point, thus generating electricity and allowing the engine to reach a better operating range. The generated electrical energy is saved in a lithium-ion battery. During high power requests, the e-drive supports the combustion engine using the previously stored energy. This boost function effectively increases the power output of the engine and improves its efficiency compared to a pure combustion engine in the same class. The basic requirement is an increased on-board voltage of 48 volt, which facilitates the safe transfer of energy between the e-machine and the lithium-ion battery. A typical 12/24-volt on-board power system used by regular consumers, such as the operating electronics of the vehicle, are additionally operated by a DC/DC converter.

The goal of the "mild" hybridisation of the compact DEUTZ four-cylinder units is to achieve the same performance as a larger combustion engine when used by customers. In the first step DEUTZ built up a TCD 2.9 with 55 kW plus up to 20 kW of peak power from the electric engine. This downsizing by way of hybridisation technology primarily saves fuel and decreases CO₂ emissions. First simulations have shown that a reduction of ten to twelve per cent is feasible. Customers therefore save on the total cost of ownership while also improving the environmental footprint of their vehicles.

The lower output of the combustion engine of only 55 kW yields another advantage: the output stays below the 56-kW threshold, meaning that no SCR system is needed to comply with the current EU Stage IV nor the upcoming EU Stage V, which will come into force in 2019. This saves further money and installation space. Thanks to the better utilisation of the diesel engine, it reaches its optimal operating temperature faster and achieves higher emission temperatures, which makes the use of a diesel particulate filter even safer. By using a smaller engine also considerably weight advantages are achieved.

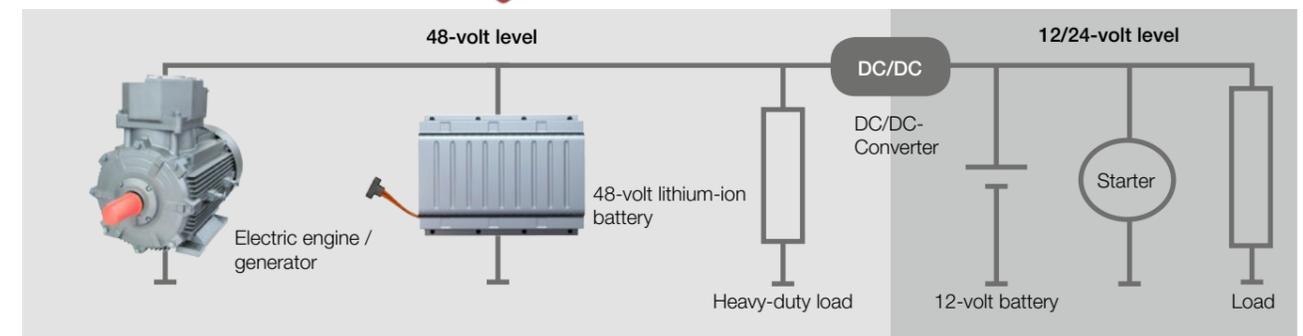
New possibilities thanks to 48 volt

The 48-volt technology is a foundation for many further optimisations of the drive system. Additional e-engines can be

used as electric auxiliary drives, for example: in off-highway applications, the drive unit tends to fulfil more functions than just locomotion. With an electric turbocharger, the performance and efficiency can be increased even further. Overall, the 48-volt technology offers a whole range of new possibilities.

DEUTZ has successfully tested its first 48-volt hybrid on its in-house test benches and will now proceed with an extensive testing phase involving different load profiles. As a first step, the system will be tested in a wheel bearing cycle, a forklift cycle and a tractor cycle. This will yield important insights, e.g. on the required battery capacity.

As part of the E-DEUTZ strategy, the further development of this technology will benefit particularly from the expertise of the DEUTZ partner Torqeedo. In September, DEUTZ announced its acquisition of this manufacturer of electronic boat engines. The long-standing specialist for electric drive systems and global market leader for marine e-mobility has far-reaching competences in components, software and system integration, which DEUTZ will utilise within the scope of a structured technology transfer. DEUTZ has scheduled the first field tests for early 2019.





DEUTZ at Agritechnica 2017

Digital, electric, certified

Between 12 and 18 November 2017, the world's leading agricultural technology companies will gather in Hanover to present their latest innovations. DEUTZ will be showcasing, amongst others, its Stage-V-certified engine range alongside new in-line engines with cubic capacities of 9–18 litres. Additional highlights include the e-DEUTZ strategy for electric drive solutions and "DEUTZ Connect", the new app for mobile engine diagnosis.

For seven days, visitors of Agritechnica, the world's largest agricultural technology exhibition, will be granted fascinating glimpses into the future of the industry. DEUTZ will be presenting its next-generation drive solutions within the scope of the specialist forum, "Systems & Components", at stand D19 in hall 16. The company is looking forward to unveiling a whole range of highlights this year. Under the motto "Our Promise – Your Flexibility", DEUTZ will be making good on its commitment to the EU Stage V emission standard, which will come into force in 2019: DEUTZ is the first engine manufacturer worldwide to be certified for EU Stage V. This success transforms the "Stage-V-ready" engines, which have been established as such since 2015, into the DEUTZ "Stage-V-certified" programme.

The first certification was awarded to the DEUTZ TTCD 6.1. The models TCD 3.6 / 4.1 / 6.1 / 7.8 and TTCD 7.8 were also certified on time for Agritechnica. The changeover from the currently valid EU Stage IV to Stage V does not require any additional installation space, so no costly modifications to the client's machine will be necessary. This gives DEUTZ customers even greater planning security and flexibility in integrating the new engines into their machines. By obtaining its first EU Stage V certificate, DEUTZ is fulfilling its environmental promise and positioning itself as an environmentally friendly engine manufacturer. The company is looking forward to presenting the world's first Stage-V-certified engine, the TTCD 6.1, live at its exhibition stand in Hanover. With its dual turbo-charging system, the six-cylinder

engine is designed especially for use in tractors.

DEUTZ embarks on electrification

The e-DEUTZ strategy will constitute another highlight of the company's appearance at Agritechnica. In September, DEUTZ announced its acquisition of Torqeedo GmbH, the global market leader and systems solution specialist for integrated electrical and hybrid boat drives. This acquisition has been a catalyst for the electrification of the DEUTZ product range. The company plans to utilise comprehensive expertise and technological portfolios in all relevant fields of electrification to support future developments in its core business segment of off-highway applications.



VISIT US AT
HALL 16 / D19

six cylinder engines with 400 kW and 2.500 Nm or 450 kW and 2.800 Nm. The largest of the four, the TCD 18.0 six-cylinder engine, boasts a performance of 620 kW and generates 3,600 Nm. These new units are designed for use in heavy-duty construction and agricultural machines with high power requirements.

Two additional engines will be introduced at the other end of the performance spectrum. The DEUTZ TCD 2.2 three-cylinder unit will be unveiled as an agricultural version at Agritechnica, featuring a structure sump for use in tractors. Its compact design makes it especially suitable for small tractors. Visitors of the exhibition will also witness the debut of the high-power version of the TCD 2.9 four-cylinder for agriculture use. The "big brother" of the TCD 2.2 has a maximum performance of 80 kW.

Mobile engine diagnostics – the DEUTZ Connect app

Stay connected! Taking heed of this official slogan of the Agritechnica specialist forum



Torqeedo battery pack: DEUTZ relies on the e-competency of its new partner.

"Systems & Components", DEUTZ will be presenting two new digital products. The free service app "DEUTZ Connect" marks the launch of a complete digital service platform. Its first available function: mobile engine diagnostics per smartphone or tablet, for which a small receiver installed in the engine transfers the necessary data via a Bluetooth interface. More functions will be added gradually. Visitors of Agritechnica will be the first to experience the new DEUTZ app concept live.

The new DEUTZ web shop (www.deutz-serviceportal.com) takes the DEUTZ service network online: Customers from all over the world have the option of contacting their local service partner online and registering their engine, as well as shopping online for service parts 24/7. The platform system combines the advantages of the worldwide web – unlimited access around the clock – with the strengths of competent on-site service: support, service and delivery remain the responsibility of the customer's local DEUTZ partner. This minimises delivery times and guarantees the best possible support.

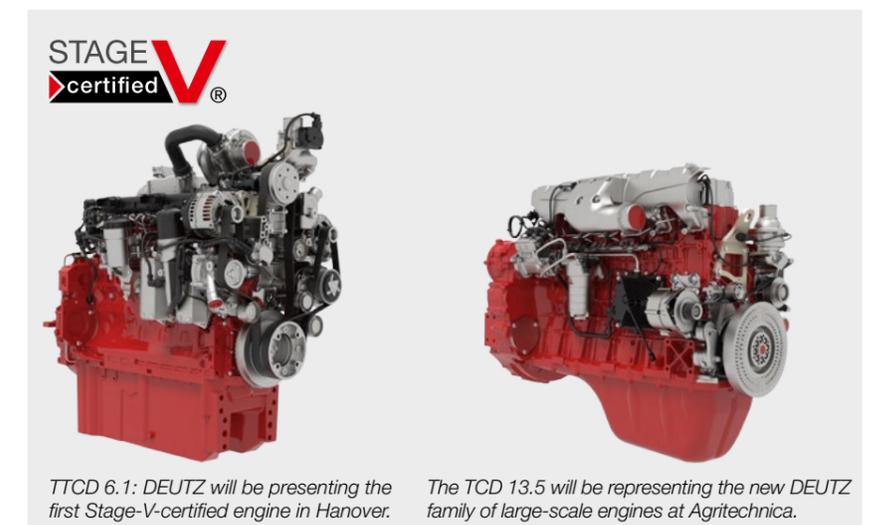
DEUTZ is looking forward to many inspiring exchanges at Agritechnica, its main platform for dialogue with partners from the agricultural technology segment. Anyone wishing to discuss new engines, future technologies or digital service products is welcome to join DEUTZ at:

Stand D19 in hall 16

Besides showcasing a drive unit from the Torqeedo "Travel" series and a battery pack, DEUTZ will be illustrating its future technology transfer at Agritechnica. The company intends to downsize combustion engines by way of electrification, resulting in a considerable decrease in operating expenses that will constitute a purchase incentive for existing and potential customers alike. Aiming for market leadership in the field of innovative off-highway drive systems, DEUTZ is establishing a competitive position for itself at an early stage.

Four new in-line engines from 9 to 18 litres

There is still a market for diesel engines, both as standalone units and as hybrids with integrated electric drives. They are especially useful in the field of heavy-duty off-highway applications. Right on time for the EU Stage V in 2019, DEUTZ will be expanding its bandwidth in the upper output range by introducing four new large-scale in-line engines with cubic capacities from 9 to 18 litres. The TCD 9.0 four cylinder has a performance of 300 kW and a torque value of 1,700 Nm. TCD 12.0 and 13.5 refer to



TTCD 6.1: DEUTZ will be presenting the first Stage-V-certified engine in Hanover.

The TCD 13.5 will be representing the new DEUTZ family of large-scale engines at Agritechnica.

We are certified!



Our promise, your flexibility: DEUTZ has honoured its commitment. DEUTZ engines have been awarded the world's first certificate for the EU Stage V exhaust emission standard. Our customers benefit from increased planning security, the greatest possible flexibility, and a strong and reliable partner in DEUTZ.

On 6 September, DEUTZ became the first engine manufacturer worldwide to be awarded a certificate for the EU Stage V emission standard, which will come into force in 2019. The company is proud to own certificate number "0001", issued by the Federal Motor Vehicle Transport Authority (KBA). By certifying its engines for EU Stage V, DEUTZ is honouring a promise it made four years before the commencement of the new standard.

In 2015, DEUTZ announced that its current generation of engines would be compliant with the anticipated Stage V standard. The company emphasised its commitment by introducing the "Stage V

ready" seal, which has adorned the entire DEUTZ TCD engine range with diesel particulate filters ever since. Following the successful certification, the "Stage V ready" seal is replaced by a "Stage V Certified" badge. The new badge will mark the TCD 3.6 and TCD 4.1 engines, which have already been certified, and the fully certified TCD 6.1 series.

On 6 September, the KBA officially certified the DEUTZ TTCD 6.1 for Stage V. The six-cylinder engine is equipped with a twin turbocharger, making it particularly suitable for use in tractors. Two days later, on 8 September, the TCD 3.6 (industrial version) with a diesel particulate filter was upgraded from Stage IV to Stage V. At 2300 rpm, the water-cooled

four-cylinder in-line engine tops out at 100 kW peak capacity. On the same day, the DEUTZ TCD 4.1 (agricultural version) was also certified for Stage V. The engine meets the requirements of EU Stage V thanks to its DVERT® Selective Catalytic Reduction (SCR) and its diesel particulate filter (DPF). At 2100 rpm, the water-cooled four-cylinder in-line engine tops out at 120 kW peak capacity. Shortly after, the industrial and agricultural versions of the popular TCD 6.1 series in the output range of 56–130 kW and >130 kW became the next units to be certified, completing the Stage V certification of the entire 6.1 product family.

DEUTZ is ready to present its newly certified engine programme with the new "Stage V Certified" badge, just on time for the world's leading trade fair for the agricultural industry, Agritechnica, which will take place from 12 to 18 November 2017 in Hanover.

Michael Wellenzohn, Member of the Board for Distribution/Marketing and Service at DEUTZ AG, explains: "We made a promise in 2015. With the world's first Stage V certificate, we have now honoured that promise. It grants our customers greater flexibility when integrating the new drives in their machines and provi-

des planning security for the transition to Stage V. We are especially proud to carry the world's first Stage V certification, which emphasises our technological edge in the field of exhaust gas after-treatment."

By obtaining its first EU Stage V certificate, DEUTZ has fulfilled its environmental promise and positioned itself as an environmentally friendly engine manufacturer. The upcoming EU Stage V emissions standard is especially challenging for engine manufacturers due to its new particle count limit, which requires a diesel particulate filter (DPF). Intelligent heat management is necessary to burn the particles collected by the DPF. This is why DEUTZ has developed the so-called "heat mode", which enables a targeted increase of the exhaust gas temperature to ensure safe machine operation. Operating a DPF requires in-depth expertise: load profiles vary wildly depending on the device in which the engine is installed.

DEUTZ draws on more than ten years of experience with the use of DPF technologies, which it already uses as standard components in its TCD product range.

► **"We made a promise in 2015. With the world's first Stage V certificate, we have now honoured that promise."**

The change of emission stages will not require any modifications, as the current DEUTZ diesel engine palette remains suitable for any machine as regards construction size. In-depth expertise for the benefit of our customers!

On 27–29 September 2017, DEUTZ celebrated this special milestone together with its customers during a "Stage-V-Certified VIP Event" organised at its headquarters in Cologne-Porz. Under the motto "Our Promise – Your Flexibility", around 150 participants received exclusive details about the Stage V certification, the current development of emission legislation and the innovative DEUTZ technologies. They also got to enjoy face-to-face conversations with experts from DEUTZ and the wider industry. The highlight of the event was a joint dinner, during which DEUTZ bestowed the "Stage-V-Certified Award" to the team of Stephan Nentwig (TÜV NORD) and the internal DEUTZ certification team under the management of Dr Peter Broll, thanking them for their support in the certification process.





Left to right: TCD 9.0 / 12.0 and 13.5 – in-line engines based on a family platform concept.

The engines will be integrated into the existing DEUTZ TCD product portfolio entirely seamlessly. Engine documentation is available from DEUTZ' own SerPic database. Customers have access to all services including the supply of spare parts at the usual high DEUTZ quality.

The new TCD 9.0/12.0 and 13.5 in-line engines constitute a family platform concept. They share approximately 65 per cent of their components, which makes the storage of spare parts especially efficient. The engines further share a common customer interface and an identical front and back. This considerably simplifies their integration and maintenance, saving training expenses for service professionals.

All four engines are technologically highly developed. Their components include cross-flow cylinder heads, a down-speeding function for reducing fuel consumption and operating noise, and a common-rail system with an injection pressure of 2,200 bar. Both at the belt and the flywheel, a power transfer of up to 100 per cent is possible. Thanks to dynamic equalising

weights, the TCD 9.0 four-cylinder is just as quiet as the larger six-cylinder models.

Overall, customers benefit of a range of flexible all-round engines with a modern, compact design, developed especially for heavy-load off-highway use. DEUTZ utilises

Overall, customers benefit of a range of flexible all-round engines with a modern, compact design, developed especially for heavy-load off-highway use.

its extensive application expertise to help buyers integrate the engines into their machines.

The four new engines with a cubic capacity of 9–18

litres are developed for the EU emission level Stage V, US Tier 4, China IV and EU Stage IIIA and comply with all exhaust gas regulations that will take effect in the near future. Serial production is scheduled to start in 2019, just on time for the new EU Stage V emission regulations.

Greater in-line power and performance

DEUTZ is expanding the top range of its portfolio by four new serial engines. With the TCD 9.0 four-cylinder and the new TCD 12.0 / 13.5 and 18.0 six-cylinders, its performance range now reaches up to 620 kW. The power transmission is particularly noteworthy: especially heavy-load applications benefit from a torque of up to 3,600 Nm.

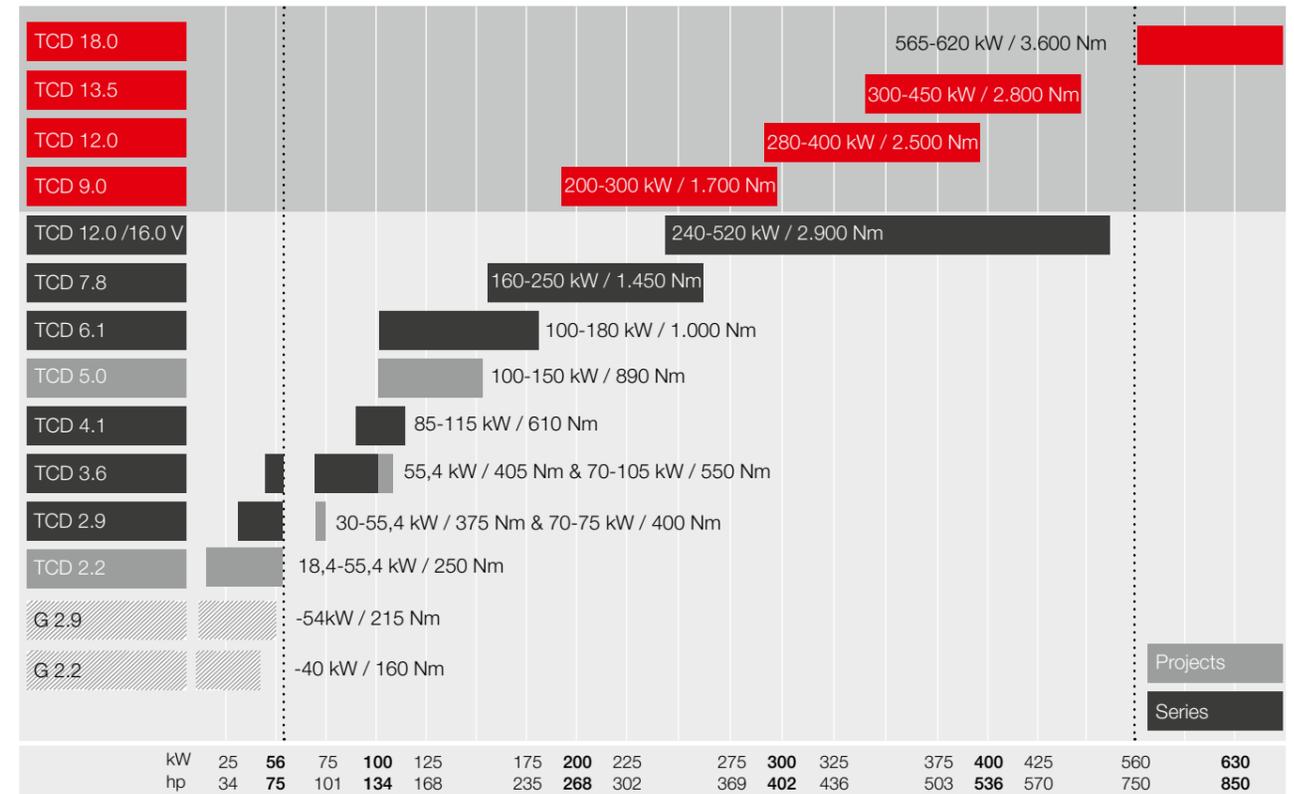
From 2019, DEUTZ will be capitalising on its strong in-line engines. Just on time for EU Stage V, the company will be launching its four new drive units on the market, thereby giving its customers a whole new world of possibilities in the range from 200 to 620 kW. At the moment, the most powerful DEUTZ in-line engine is the TCD 7.8 with 250 kW. The four new models continue where the TCD 7.8 left off: they come with a maximum output power of 300 kW

(TCD 9.0), 400 kW (TCD 12.0), 450 kW (TCD 13.5) and 620 kW (TCD 18.0), making them predestined for heavy-duty construction and agricultural machinery. Their torque is 1.700 / 2.500 / 2.800 and an impressive 3.600 Nm, respectively.

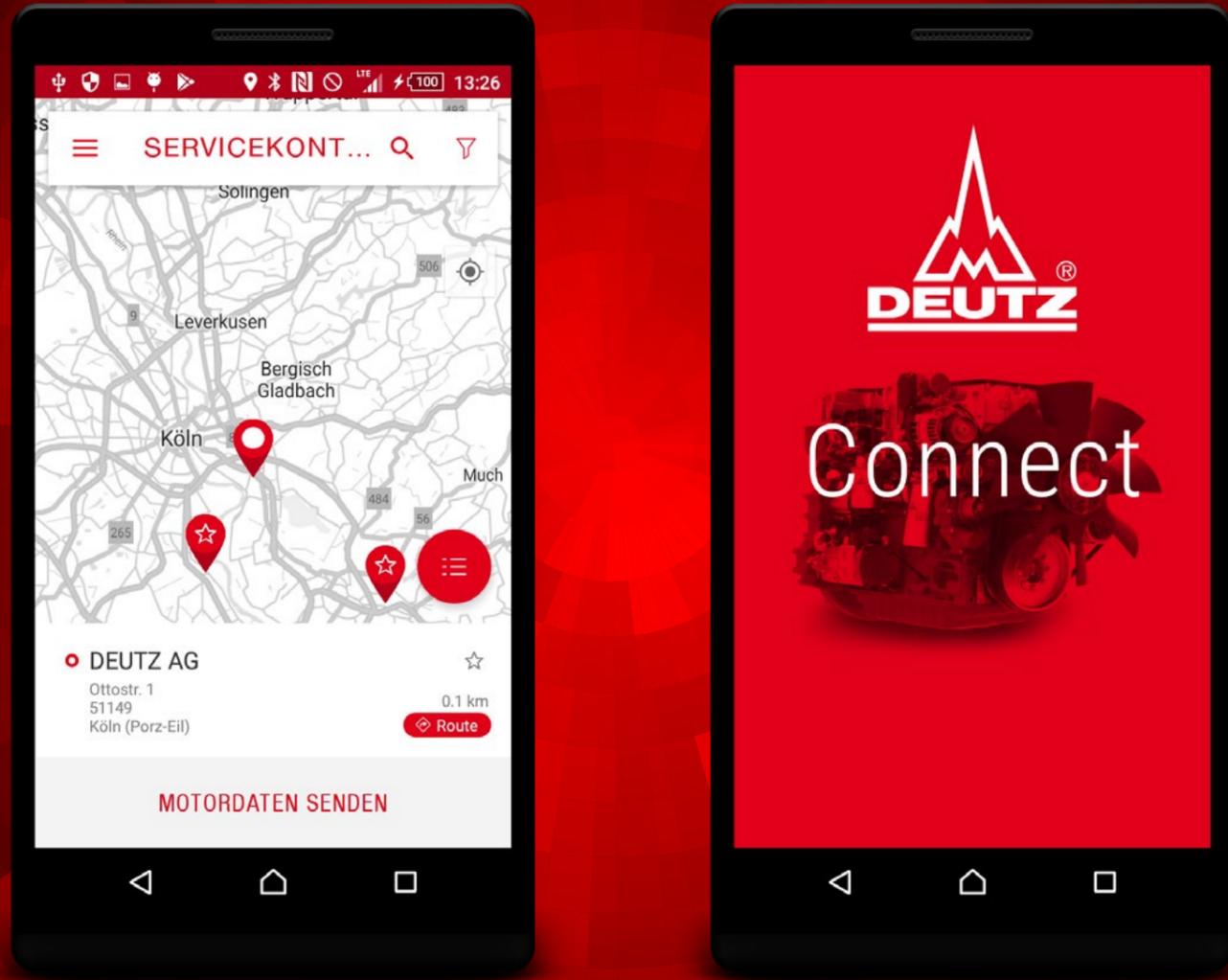
The well-known DEUTZ V-engines TCD 12.0 V and 16.0 V (available with six or eight cylinders each) remain part of the product portfolio, but they will be set aside for special applications on account of their

structure. These applications include push-back tractors at airports, a segment in which DEUTZ is the market leader for drive technology and its V-engines constitute a technical benchmark.

The four new in-line engines are the result of a partnership with the construction machine manufacturer Liebherr, which started in August of 2017. DEUTZ holds the worldwide distribution and service rights for the products in various applications.



Extended DEUTZ product portfolio EU Stage V and US Tier 4 from 2019



DEUTZ presents its new service app: DEUTZ® Connect

Right at the start of Agritechnica, DEUTZ will be unveiling its new DEUTZ® Connect app. During their interview with DEUTZWorld, the project managers of the application, Dr Matthias Szupories and Thomas Brehmer, as well as Michael Rosner, DEUTZ Service, will be explaining the advantages that DEUTZ customers will enjoy with this new tool.

DEUTZWorld: Dr Szupories, you have developed the DEUTZ® Connect App together with a team of colleagues from the R&D and service department. What can our customers look forward to?



Dr Szupories: Our DEUTZ® Connect App is a combined hardware/software solution that aims to optimise all processes along the value creation chain between DEUTZ, the

OEMs, the dealer and service networks, fleet operators and consumers. We have already installed the first important features. For instance, the app provides a clear overview of all engines and a customised engine administration tool that allows its users to specify regular maintenance intervals. All relevant engine data and the error memory can be read and sent to the dealer in just one click. The dealer receives all information in advance, which allows them to repair the engine quickly and efficiently and reduce downtimes considerably. Images and measurements carried out can be added to the report.

DEUTZWorld: To what extent does the app take advantage of synergies, e.g. with the service area?



Rosner: We will be integrating all future e-services and all traditional services into the app as icons, including the dealer search and selection of preferred dealers. And, of course, the web shop, which we have already integrated. You can use www.deutz-serviceportal.com to contact local service partners, buy original DEUTZ spare parts and accessories for DEUTZ engines. Simply enter the engine number to find parts that match your engine or submit engine-specific service queries directly to the service partner. All of this information will soon be integrated into the app.

DEUTZWorld: Customer satisfaction is a top priority for DEUTZ. How does the app help the company solve problems as soon as they come up?

Dr Szupories: Real-time digital networking along the entire chain of involved partners makes it possible to respond to problems promptly. The app allows us to provide our services in real time to generate the greatest possible benefit for our customers. Our development is flexible: after all, the requirements of our OEMs and dealer networks vary depending on their segment and region. And this agile approach to development contributes to our ability to solve problems fast. It helps us respond to our customers' requirements flexibly, develop new functions during so-called "sprints" and test them right away with our customers and partners. This means that we involve our partners in the development of the app from the start by determining the next solutions in advance. Our first e-service, the "Long-Distance Diagnostic Service", came into being in this way. We have been able to convince many OEMs and dealers to take part in the pilot project, both in EMEA and the USA. Together with

our partners, we can develop new e-services for any challenge that comes up in the field and make these services available in the app. An interdisciplinary team of professionals from development, technical service, sales, purchasing and marketing has been working on this tool for several months now.

DEUTZWorld: How does it work in practice?



Brehmer: Firstly, customers need to download the app from the DEUTZ website or the App Store. They also require a hardware package consisting of an OBD adapter and adapter cable. These items can be ordered from your preferred retailer via the web shop and connected with any smartphone, tablet or PC. Once the hardware has been connected to the engine using the adapter cable, engine data can be accessed in real time, and the function "Dealer and DEUTZ" can be activated if a problem occurs. In line with our service slogan – "We care. We support. We deliver" –, we work with our OEMs and our dealer network to fix errors.

DEUTZWorld: How do the dealers interact with the app?

Dr Szupories: The dealers are the first point of integration and a service anchor for the fleet operators and consumers. We deliberately give them a central role in order to make the sales and service process faster and more efficient for the users of our engines. Every feature we offer needs to provide a clear benefit to our customers. This is crucial to

► **"Nowadays, we as a DEUTZ Dealer are facing demand from OEMs and end-users to perform a repair of an engine in the shortest possible time. To perform such a fast repair, first of all we need to carry out an electronic diagnosis of the engine. With the DEUTZ Connect App we will receive enough of the data needed to prepare the repair solution and we can equip our respective serviceman with all needed spare parts. DEUTZ Connect will surely shorten the downtime of machines, and additionally we will have closer contact with customers."**

Maciej Bruski, BTH Fast

us. We are testing each of our new eServices with interested OEMs, dealers and fleet operators (cf. testimonial).

DEUTZWorld: What made you create this tool at this point in time?

Rosner: On account of its significance and this year's topic, Agritechnica 2017 is the perfect occasion for presenting our e-service developments and reach new partners and consumers. And it is the world's largest trade fair for agricultural machinery, making it an excellent platform for dialogue with our partners from the agriculture segment. This is why we worked especially hard to launch our app on time for the event.

DEUTZWorld: Which feature is your personal favourite?

Dr Szupories/Brehmer: The "Long Distance Diagnostic Service" is our favourite feature. In case of a downtime, the affected user or fleet operator can access the error memory very economically, supply photographs if required, and send the files to their selected partner in real time. Both the partner and DEUTZ are then involved via the customer support centre. We want to make sure that errors are detected and dealt with promptly. This allows us to give our customers the benefits we have promised.



IML Motori becomes DEUTZ Italy

DEUTZ and IML Motori are connected by a success story dating back more than a century. This fruitful partnership will continue in the future, but its structure is set to change: DEUTZ has recently acquired the Italian retailer headquartered in Lomagna, effectively strengthening its Italian sales and service network.

On 5 October 2017, DEUTZ announced its acquisition of its long-standing sales and service partner IML Motori. The acquisition also included the subsidiary IML Service and the Romanian sales and service company IML Motoare. With this move, DEUTZ has effectively expanded its growth in the profitable service business and further increased its proximity to its Mediterranean customer base. As of now, the company will be operating in Italy under the name of DEUTZ Italy.



Michael Wellenzohn

IML Motori has been maintaining a successful partnership with DEUTZ ever since the Keller family founded the company in 1904. It is integrated into a country-wide service network in Italy and Romania and has been a long-standing, exclusive contract partner in both countries on account of its excellent service performance. The last annual revenue of IML Motori was approximately EUR 45 million. DEUTZ' acquisition of its trusted sales partner took place in agreement with the owner family within the scope of a long-term follow-up agreement.

intensive customer relationship" Michael Wellenzohn, Member of the Management Board of DEUTZ AG in Sales, Marketing and Service, explained.

The experienced management team of IML Motori, headed by Roberto Brivio, will be responsible for serving the Italian customers of the DEUTZ Group. "The acquisition of IML by DEUTZ reflects the long-term commitment of DEUTZ to the Italian market. Being part of the DEUTZ Group means that we will work together even more closely in the future and get to use DEUTZ innovations and resources – like the electrification and electric boat drives by Torqueedo – early on. This will allow us to penetrate the Italian market more efficiently, including in the marine segment," Roberto Brivio assures us.

As a manufacturer of innovative drive systems, DEUTZ is setting its strategic course for the future by expanding its activities especially in the topics of innovation, service and internationalisation.

The acquisition of IML Motori is primarily intended to strengthen the international DEUTZ service business. "This acquisition is in line with our strategy of investing in our own service network at select locations in order to continue our growth in this profitable segment. The increasing complexity of the engine business requires us to maintain close contact with our customers. The acquisition of IML Motori will mean that our Italian customers benefit from even more DEUTZ expertise locally and from a more



About IML Motori

For more than 100 years, IML Motori has been a distributor of diesel engines and DEUTZ spare parts for industrial and agricultural machinery, automotive and stationary plants on the Italian market. The company also modifies DEUTZ engines to meet their customers' individual requirements beyond the wide range of standard products offered by DEUTZ itself. Thanks to a closely knit network of distributors, IML Motori is capable of providing customer service to buyers of DEUTZ and other brands all over Italy.



► **"Being part of the DEUTZ Group means that we will work together even more closely in the future and get to use DEUTZ innovations and resources early on."**

Roberto Brivio





A bridge made of coconut trees for DEUTZ power units

Three years ago, the newly elected Indonesian government decided to expand the country's existing electricity grid to supply its rural regions with energy. To master this challenging project, the government chose the reliable power units produced by DEUTZ.

In early 2017, the state-owned energy company PT. PLN and PT Maxi Utama Energy, an authorised DEUTZ distributor in Indonesia, visited DEUTZ AG for an initial, exploratory meeting. Only shortly after, the successful power units from Cologne got the job. As early as April, 2017, DEUTZ and its Indonesian partners signed a contract for two bundled offers including 103 units at 100 kW (BF6M1013EC) and 136 units at 200 kW (TCD2013 L6). The contract further covered a long-term maintenance agreement to ensure the availability of spare parts at remote locations.

The DEUTZ distributor PT Maxi displayed great initiative and commitment to supplying its extensive shipment within 4 months as planned. Mr Malik, Chairman of the Board of PT. Maxi Utama Energy, explained: "We have invested a great deal of effort in completing this order from PLN and the government. A total of 37,500 kilowatts had to be installed in a timely fashion within the scope of a demanding delivery schedule and fitting works to be carried out on remotely located islands." The project required rigorous commitment and intense cooperation between the PT. Maxi Utama Energy project management team and the Asian subsidiary DEUTZ Asia-Pacific. It additionally involved suppliers of transformers, switch panels and cables, construction companies, forwarders and local contractors who worked together like gears in a clock to complete the work at all assembly sites at the same time.

A total of 239 generators were installed on nearly 100 different islands all over Indonesia. Most of these islands had neither a harbour nor on-site lifting gear. The timely delivery of the generators, transformers and other equipment frequently called for considerable creativity. Tenny Septina, Chairman of the Board of PT. Maxi Utama Energy, describes the circumstances in which the units were delivered and installed.

DEUTZWorld: *Tenny, in which Indonesian region are the installation sites? What specific challenges did the location raise?*

Tenny: We have delivered 239 power generators to around 100 remote islands and regions, all of which have their own ethnic groups and cultures. Some of the sites are so far out that only 20–150 families even live in the area. Sumatra consists of many smaller islands, including Riau, Belitung, Bangka, Nias, and so on. Maluku and Papua have smaller islands that require a month's travel by sea and land. The Kalimantan islands were even harder to reach: there are no roads or paths there. Due to the low water level of the river, the boat could not carry the whole power generator during the summer. We had to disassemble the parts and load them onto smaller vessels for transport.

DEUTZWorld: *How long did the transport and installation take?*

Tenny: We established five project management teams and had to decide which sites were particularly critical, requiring prioritisation and special attention. The contract specified that all units had to be supplied within four months. Assembly and production of the 239 units generally took one to two months, and so did the shipments from Jakarta and Surabaya. We needed a further month to install and start up the units on site. Unfortunately, the roads were in a terrible state at the time

and we needed to improvise a lot. That included looking for coconut trees to build a makeshift bridge, which took up to two weeks and incurred additional expenses for hiring local helpers. We also had to disassemble the power generators to use the road and the bridge. In the end, the generators needed to be reassembled on site. And those were not the only challenges: stretches on sea were often affected by high waves and tropical storms, and travel on the river was extremely difficult due to the low water level. These difficult circumstances at the various sites meant that we could only install the silenced power generators using the knock-down system, i.e. with the generators completely disassembled into their component parts.



DEUTZWorld: *How did the people living in those areas react to the installation of the generators?*

Tenny: Those living on the very remote islands might have been under the impression that the government was not doing enough to improve their standard of living. On one island at the Malaysian border, the locals protested and even considered moving to the

neighbouring country for better living conditions. When we delivered the power generators to those places, they were being awaited eagerly already. The locals kept a keen eye on the installation process and stayed with the technicians all day. They even urged them to start the engine immediately, even though the powerhouse was not completed yet. Our technicians weren't even allowed to go check on other sites before the power supply had been switched on.

DEUTZWorld: *In retrospect, was the hard work worth it?*

Tenny: Absolutely! The local people were waiting for power, and seeing their joy was definitely worth all the obstacles and strains involved in the process.

DEUTZ Carolinas becomes DEUTZ Power Center Southeast

Same commitment to enhanced support and product availability under a new name. DEUTZ continues its commitment to the successful Power Center concept the company launched in 2016: DEUTZ Carolinas is now officially DEUTZ Power Center Southeast.

DEUTZ Power Centers provide dedicated application engineering and technical sales resources closer to smaller and mid-sized machinery manufacturers. Unlike DEUTZ Service Centers, they also offer an extensive range of value-added products and services to match customer needs and expectations.

"When I started working at DEUTZ Carolinas in September 2013, the first thing I did was visit customers to understand their prior experiences with DEUTZ," said Brian Fox, general manager of DEUTZ Power Center Southeast. "It became clear that customers in our region needed more attention. I had experience developing business plans that focused on service, expectations and employee behavior, and our staff at DEUTZ Carolinas began implementing such a plan. That's where the DEUTZ Power Center idea began to take shape."

DEUTZ Service Centers provide regularly scheduled maintenance and emergency service of DEUTZ engines, either at the Service Center location or at the customer's site via traveling service technicians. Service Centers also sell genuine DEUTZ parts and fluids. DEUTZ Power Centers do all those things, plus design, engineer and

manufacture DEUTZ-branded products. Customers within a Power Center's designated sales area can also purchase new DEUTZ engines powered by diesel fuel or natural gas, as well as DEUTZ Xchange remanufactured engines.

"Our Power Centers make it possible to provide OEMs with custom value-added production and assembly services," said Robert Mann, president of DEUTZ Corporation. "As a result, we can ensure that any custom engine specs and configurations fully comply with an OEM's needs. And, we can ship engine inventory on a just-in-time basis to OEMs in each Power Center region, who can then install those engines directly upon receipt."

To learn more about DEUTZ Power Center Southeast, as well as its complete line of diesel and natural gas engines, please visit www.deutzpower.com.





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OUR PROMISE YOUR FLEXIBILITY

We've kept our promise to ensure your company's success.

With smart solutions for exhaust after-treatment, DEUTZ engines guarantee reliable, sustainable operation, as well as the highest degree of flexibility for our OEM customers.

In fact, our engines have received global certification for meeting EU Stage V exhaust emission standards that go into effect in January 2019. As a result, you can rest easy installing DEUTZ diesel engines in your machines now and in the months or years to come. Profit from our expertise!



STAGE V certified®: DEUTZ AG is the first engine manufacturer worldwide to be awarded the official certificate for meeting the latest exhaust emission standard, EU Stage V. This standard will go into effect January 2019.

The engine company.

