POWERSOURCE

A publication of John Deere Power Systems

Spring 2018

A 'MASTER CLASS' IN RECYCLING

COMBILIFT CELEBRATES A MILESTONE WITH A NEW FORKLIFT
PAGE 4

GREEN ROOFS GROW WORLDWIDE
PAGE 10

HELPING HURRICANE VICTIMS
PAGE 16

CRUSH IT TO PIECES WITH RUBBLE MASTER
PAGE 12

A CLEANER WAY TO CUT CONCRETE
PAGE 22

ON THE COVER
The RM 120GO! breaks ground with a versatile crusher that can quickly switch from recycling to processing stone. *Photo courtesy and copyright of Rubble Master HMH GmbH.*

POWERSOURCE

COVER STORY

12 Rubble Master GmbH crushes it with the RM 100GO! and RM 120GO! Both possess the power to process everything from reinforced concrete to hard stone. A long-time customer of John Deere engines, Rubble Master now offers both Tier 3/Stage III A and Final Tier 4/Stage IV engines on its mobile compact crushers. "The dynamics of a crusher require a good engine response to maintain a constant speed at highly fluctuating loads," says Heinz Jank, Rubble Master's research and development manager. "These engines deliver that."

MATERIAL HANDLING

3 Engine simplicity makes the Çukurova Makina wheel loaders ready for tough work in remote regions

4 Combilift reaches a milestone with its first multi-directional forklift powered by a Final Tier 4/Stage IV engine

6 Bemo Rail's shunting locomotives get on track with John Deere engines

SUSTAINABILITY

7 Genesal Energy's multi-energy hybrid system supports Europe's sustainable energy movement

8 Greenhouses are on the rise with the help of Dutch-built scissor lifts

10 Express Blower assists with the growth of green roofs worldwide

GENERATORS AND PUMPS

14 John Deere–powered Gen-Tech generator is top draft pick for Dallas Cowboys

16 John Deere and its engine customers support regions traumatized by hurricanes

CONSTRUCTION

18 Hogg & Davis cable pullers deliver an astounding high-wire act

19 Broce Broom RJT-350 makes a clean sweep with a Final Tier 4/Stage IV engine

20 Vermeer Corporation's new horizontal directional drill likes rock and a whole lot more

22 BW Manufacturing's D-1800 cuts down the dust when cutting and shotblasting concrete

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To learn more about John Deere engines and drivetrain components, visit *JohnDeere.com/jdpower*.

The 224-kW (300-hp) PSS 9.0L engine drives the 990 wheel loader.

SIMPLY INNOVATIVE

Çukurova Makina tackles remote, rough terrain with a new 990 wheel loader

Çukurova Makina in Tarsus, Turkey, aims to use new technologies to give contractors an extra edge. Following the tremendous success of its 940 and 980 wheel loaders, Çukurova recently introduced its latest and largest 990 wheel loader. A powerful John Deere PowerTech™ PSS 9.0L Tier 3/Stage III A engine, a 420-liter (111-gallon) fuel tank, and a 4.5-cubic-meter (4.6-cubic-yard) bucket give operators what they need to work for longer periods of time, even under harsh conditions.

Çukurova's wheel loaders are already used for mining, construction, and public works applications worldwide. Now, these powerful, durable, and easy-to-use workhorses are also becoming popular with the military.

The power of simplicity

In 2017, the Turkish Ministry of Defense ordered four 990 wheel loaders for general duties, including building roads, lifting barriers, and stockpiling material. The rugged 990 was built specifically for these tasks. An electro-hydraulic steering system gives the operator power, control, and versatility. An oscillating rear axle allows the loader to track rough terrain while maintaining four-wheel contact with the ground, and a customized hydraulic system enables quick attachment switching.

"Çukurova originally designed the 990 around a PSS 9.0L Final Tier 4/Stage IV engine. However, since the Ministry's wheel loaders would be deployed in remote areas, they preferred the simple engine technology of a Tier 3/Stage III A engine," explains Sabit Batmaz, export sales manager. Giving operators an extra edge, Çukurova added a 420-liter (111-gallon) fuel tank, further extending the time between fueling.

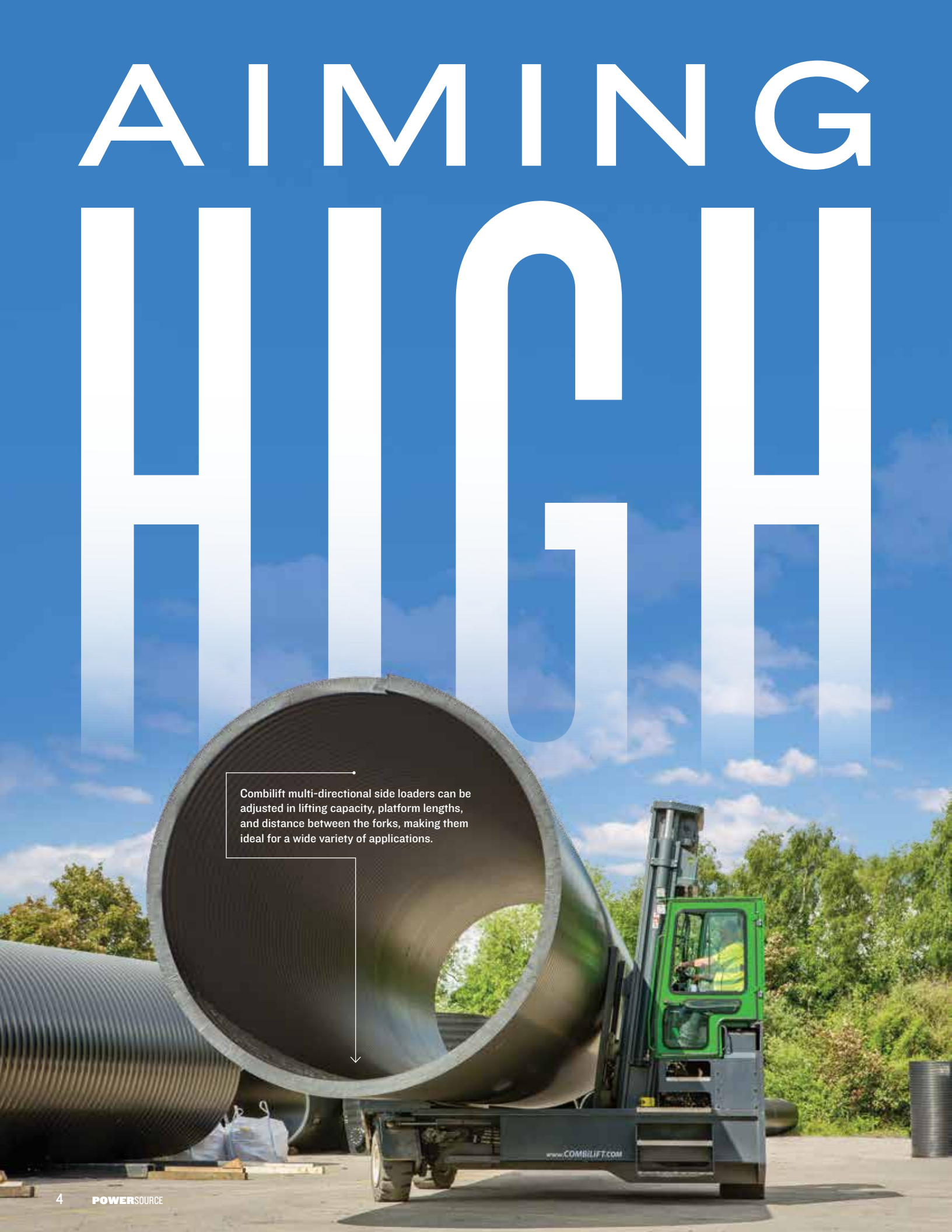
The extra edge: equipment that keeps going

Veli Karakus, export area manager, underlines the role John Deere engines have always played in the performance and durability of the company's equipment. "The more compact 940 and 980 wheel loaders and the CMI723 crawler excavator are performing perfectly with their PowerTech M, E, or Plus 6.8L Tier 3/Stage III A engines. We were confident that the larger PowerTech Plus 9.0L Tier 3/Stage III A engine would be a great fit for the 990," Karakus adds.

"When we need to develop maximum power at high speed, the 100 percent dynamically balanced crankshaft ensures maximum efficiency." At the moment Çukurova is developing new models of crawlers and wheeled excavators that will also be fitted with the same 6.8L engine.

"Even while we have successfully grown, we have kept our production flexible," Batmaz concludes. "We respond to customer needs quickly, and our strong international dealer network backs up our products with expert service. It's a 'simply innovative' approach."

AIMING HIGH



Combilift multi-directional side loaders can be adjusted in lifting capacity, platform lengths, and distance between the forks, making them ideal for a wide variety of applications.

Combilift marks 30,000 units sold with delivery of first Final Tier 4/Stage IV-powered C14,000 multi-directional forklift

At CeMAT 2017, Combilift handed its 30,000th unit sold — the first C14,000 multi-directional forklift powered by a John Deere PowerTech™ 4.5L Final Tier 4/Stage IV engine — to steel production giant Haslinger Stahlbau. But managing director Martin McVicar's ambitions stretch further. With new facilities opening in April 2018, he hopes to increase production by 2023.

McVicar has good reason to be confident in his ambitious goals. The Combilift concept combines a forklift and a side loader, together in one maneuverable, multi-directional and cost-effective machine. Before customers buy, Combilift's free warehouse design service offers them a unique view of how the Combilift product can optimize their space. With this service, they have the information they need to calculate their return on investment.

Long loads, all ways

Haslinger's new C14,000 will work alongside a range of Combilift equipment at the company's European sites. Boasting a lifting capacity of 14,000 kilograms (30,000 pounds) and a sturdy construction, the C14,000 was built to handle long and heavy loads such as steel, concrete, prefab timber frames, or machine components. The versatile unit can perform all the warehouse material handling tasks of a counterbalance forklift, an aisle truck, and a side loader — inside the warehouse and outside in the yard.
The C14,000's unique 4-way steering system allows it to travel sideways while carrying long loads. This unique concept is how Combilift can deliver space savings of up to 100 percent.

Powering forward to warehouse efficiency

The C14,000 delivered to Haslinger was a landmark for an additional reason: It was the first to be fitted with a 4.5L Final Tier 4/Stage IV engine, instead of the previous Tier 3/Stage III A model. "We use John Deere engines in all our larger-capacity diesel-powered models, but this was our first trial with the new technology," continues McVicar. "E.P. Barrus Ltd. (John Deere engine distributor for U.K. and Ireland) was a great help. They suggested a 4.5L engine and identified the most suitable cooling radiator. The very essence of the multi-directional concept is to enhance warehouse efficiency, so we were keen to keep machine design as small as possible. Barrus also advised us to position the SCR (selective catalytic reduction) unit away from the engine so we could fit the entire package in a tighter envelope."

Already, over 30 C14,000 units have been sold to companies worldwide in 2017, including to OEMs such as Liebherr Group and John Deere. Combilift's order book includes another 12 — with 4.5L engines — in the making. When you aim high, it seems the sky's the limit.

Distributor: E.P. Barrus Ltd., Bicester OX26 4UR, United Kingdom; *www.barrus.co.uk*

Thanks to its high ground clearance, the CI4,000 is ideally suited for both indoor and outdoor use.

At CeMAT 2017, Combilift handed its first CI4,000 multi-directional forklift powered by a 4.5L engine to steel production giant Haslinger Stahlbau.

ABOVE AND BELOW

Bemo Rail's customizable shunting locomotives keep businesses and metros moving forward

Yara International's products and services support customers to ecologically produce nutritional food. That's why it turned to Bemo Rail for a customized BRD100 shunting locomotive for its production facility in Sluiskil, the Netherlands.

Yara's Sluiskil facility produces 4.9 kilotons (5,401 U.S. tons) of nitrogen fertilizers and industrial chemicals annually, using railways to transport raw materials and finished product. The shunting locomotive will be used for bulk material handling at Yara's storage facilities.

Bemo Rail, located in Warmenhuizen, developed a 2-axle, 40-metric-ton (44-U.S. ton) locomotive with a pulling force of 10 metric tons (11 U.S. tons). A remote control and a carriage brake system keep staff safe during coupling and uncoupling.

Engines that deliver

Bemo Rail recommended a John Deere PowerTech™ PVX 6.8L Interim Tier IV/ Stage III B engine that features cooled exhaust gas recirculation (EGR) for NOx control, and an advanced diesel oxidation catalyst (DOC) and diesel particulate filter (DPF) for reducing particulates. The engine operates at a lower speed — keeping noise and fuel consumption down — yet has sufficient capacity to meet peak power demands.

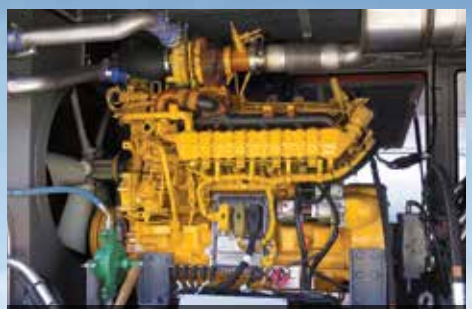
Bemo Rail's first experience with John Deere engines occurred while upgrading a railroad maintenance unit. "We really clicked with John Deere distributor NPS Diesel B.V. Like us, they focus on finding a solution rather than just selling a product," says Ron Entius, project manager at Bemo Rail. "Using 3-D software, NPS engineers ensured a seamless integration of the engine into the locomotive and optimal performance. We know that John Deere engines are reliable, even when a locomotive has been sitting idle for a while. Therefore, we have placed an order for seven more, including six 9.0L Final Tier 4/Stage IV engines and one Interim Tier 4/Stage III B 9.0L engine."

Solutions above and below ground

Bemo Rail's shunting locomotives are highly customizable. "We start with a standard frame, then customize width, length, pulling force, axles, and more, depending on the application," Entius explains. "In fact, they are gaining popularity in underground metro operations, for shunting and maintenance of trains.

"Our focus is always on finding the best-fit solution. For instance, one customer we advised using a winch instead of a locomotive, because it was more than adequate for his short-track application. I am confident that this dedication to finding the most appropriate, cost-effective solution is the reason so many companies come to us."

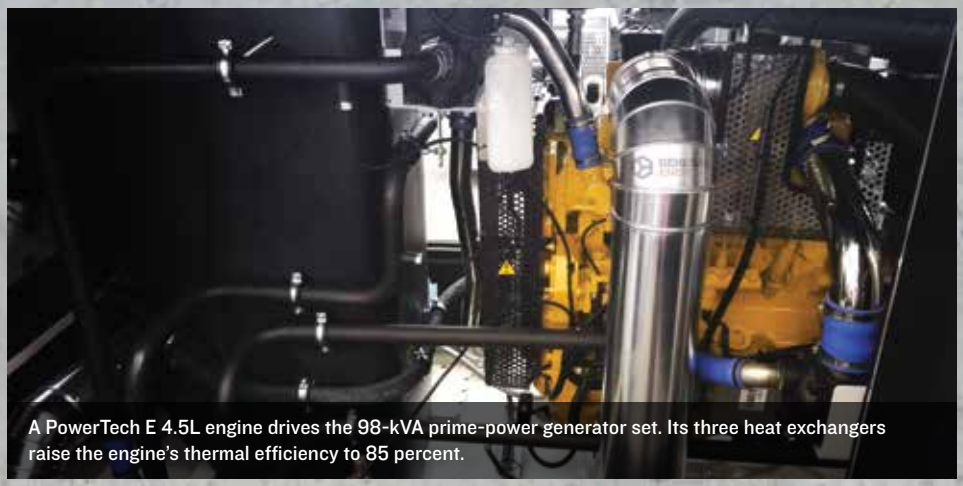
Distributor: NPS Diesel B.V. in Ravenstein, the Netherlands; *www.npsdiesel.com*



The PVX 6.8L engine can operate at lower rated speeds, reducing noise levels and improving fuel economy.

The new BRD100 shunting locomotive keeps raw materials and finished products moving at Yara's production facilities.

The engines' configurations enabled Genesal to adapt the design of the CHP multi-energy system to peak efficiency. Should the micro-network fail, the two groups of generators change their mode of operation to ensure a constant flow of energy.



A PowerTech E 4.5L engine drives the 98-kVA prime-power generator set. Its three heat exchangers raise the engine's thermal efficiency to 85 percent.

ZEROING IN ON ENERGY

Co-created OG+ microgrid, with Genesal Energy multi-energy hybrid system, boosts sustainable energy use in Spain

Nearly zero energy* by 2020? To meet the ambitious target of the European Commission, new buildings not only need very efficient energy performance, but they must also use mostly renewable sources. In Spain, four companies have successfully combined their individual expertise to develop an off-grid, multi-energy system that will power the 4,000-square-meter (4,784-square-yard) premises of a company in Spain, reducing its environmental footprint.

It is an inspiring example of how co-creation can drive sustainable development. The OG+ system uses multiple energy sources, which are combined in advanced control algorithms for their use and accumulation. Four companies gave their R&D departments complete design freedom to contribute their latest innovations. Genesal Energy provided a hybrid biodiesel cogeneration system powered by two John Deere Tier 3/Stage III A engines.

Completing the building's ecological profile, locally sourced eucalyptus wood offers excellent insulation, and rainwater is captured for reuse. Maximizing the natural sunlight reduces energy consumption for lighting, while increasing visual comfort. Even before completion, the building received an "outstanding" energy-efficiency rating by BREEAM, the world's leading sustainability assessment method for buildings.

Integrating technologies

Combined heat and power systems (CHPs) are not a new idea. The very first "proper" power plant in the world, built in 1882 in New York City, used CHP principles. Now this approach of the past is enabling a solution for the future.

Zero energy also requires the use of renewable sources. The OG+ microgrid produces energy from a combination of wind, thermal, solar, and biodiesel. The 100 kW of wind energy and 165 kWp of photovoltaic energy generated are accumulated in an Energy Storage System (ESS), which is a large bank of batteries that distribute power to the building and electric car recharging points.

The CHP multi-energy system consists of two generator sets, powered by John Deere PowerTech™ E 4.5L and 6.8L Tier 3/Stage III A engines. "The system has been designed for B100 fuel, but until 100 percent biodiesel is readily available, we will use a regular blend of B20," explains Alberto Docampo Gesto, innovation manager at Genesal Energy. John Deere engines can operate on biodiesel blends above B20 (up to 100 percent biodiesel) only if the biodiesel is permitted by law and meets the EN 14214 specification (primarily available in Europe).

Long-term local John Deere engine distributor Transdiesel suggested the 103-kW (138 hp) PowerTech E 4.5L engine with three heat exchangers for the 98-kVA prime-power generator set. "The heat exchangers raise the engine's efficiency considerably," says Jérôme Zanon, general manager of Transdiesel. "The thermal energy generated will be used for heating in winter and cooling in summer (via an absorption refrigerator)." A 202-kW (271-hp) 6.8L bare engine drives the 200-kVA backup generator.

Keeping total control

The combined technologies are managed by the OG+ advanced control system, which coordinates energy generation, storage, and consumption in real time. Genesal also developed an Internet of Things (IoT) software program to identify productivity improvements, and replaced preventative maintenance with predictive maintenance for more efficient management.

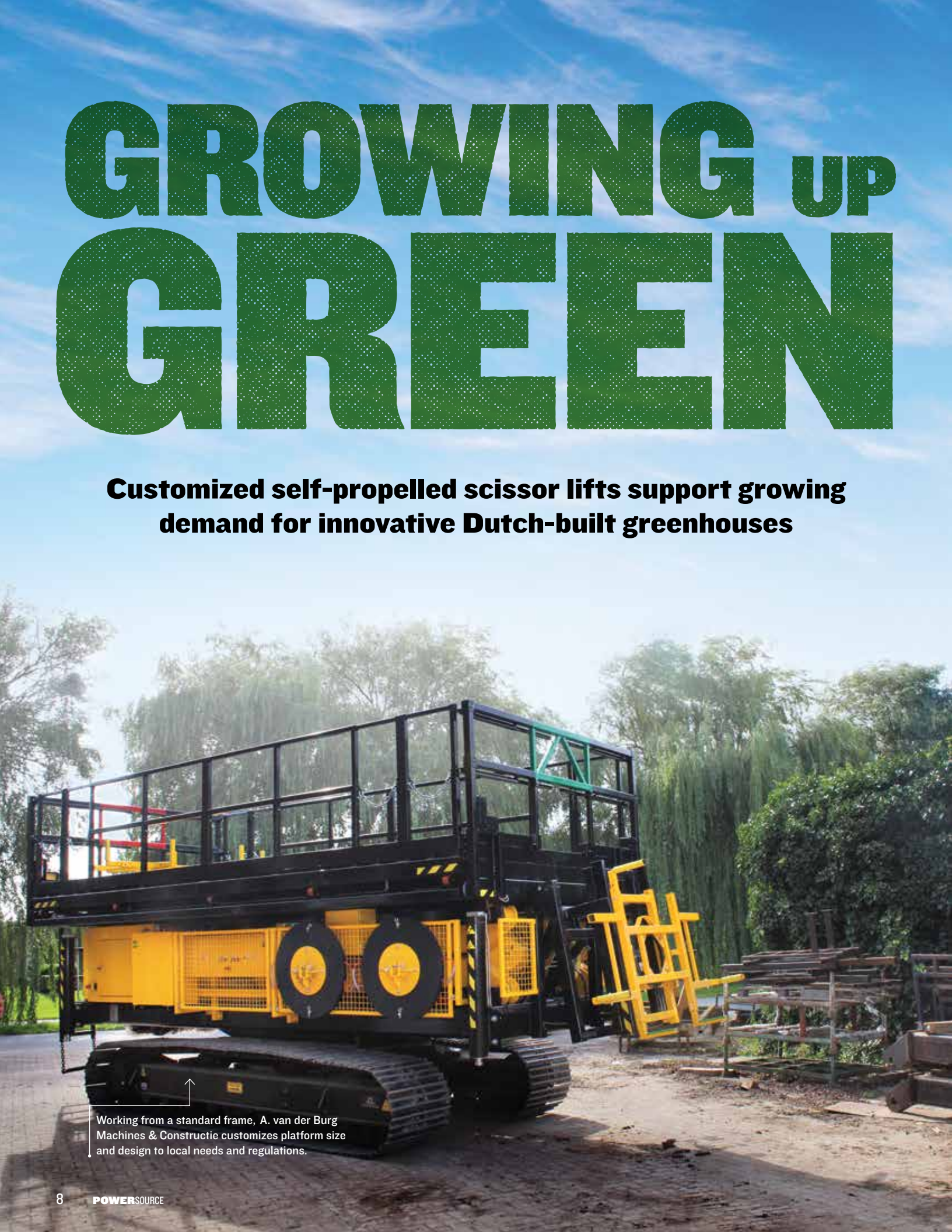
"Projects such as these demonstrate that Genesal is a benchmark company striving to provide innovative, sustainable energy solutions," says Docampo Gesto. "And that's what is needed as we all move towards the 2020 goals."

Distributor: Transdiesel S.L. in Coslada (Madrid), Spain; *www.transdiesel.es*

* Nearly zero energy buildings have very high energy performance. The low amount of energy that these buildings require comes mostly from renewable sources.

GROWING UP GREEN

Customized self-propelled scissor lifts support growing demand for innovative Dutch-built greenhouses



Working from a standard frame, A. van der Burg Machines & Constructie customizes platform size and design to local needs and regulations.

Using commercial greenhouses, even in the coldest, rainiest regions can build a healthy, sustainable agricultural sector. The Netherlands may be leading the way with over 9,000 hectares (22,240 acres) of greenhouses growing more than €7.2 billion worth of products. Countries such as Canada are making major investments, too. Coming from the Dutch heartland, A. van der Burg Machines & Constructie (van der Burg) knows the special needs facing the companies building these massive, innovative structures.

Recently, van der Burg in Berkel en Roderijs adapted two self-propelled scissor lifts to Canadian specifications — including John Deere Final Tier 4/Stage IV engines — for Voorwinden Group. This Dutch greenhouse construction company is a major player in the sector: In 2016 alone, it erected greenhouses covering an area the equivalent of 250 soccer fields worldwide. The new scissor lifts will help Voorwinden keep up with ever-growing global demand.

Setting the bar high

"Investment in sustainable growing methods is increasing," says Arjan van der Burg, co-owner of van der Burg. "Some projects are huge, involving very tall greenhouses spreading over hectares of land. Scissor lifts are crucial to help builders meet deadlines and keep crew safe. They are used to lift bulky components and provide an aerial work platform for installing glass plates, windows, and vents."

"With such ambitious projects, greenhouse manufacturers need design flexibility for local conditions and regulations."

— Arjan van der Burg

Van der Burg starts with a standard frame then customizes the platform size and design to the customer. "With such ambitious projects, greenhouse manufacturers need design flexibility for local conditions and regulations." The self-propelled scissor lifts for Voorwinden Group have an 8-meter (26-foot) reach and a 6 by 2.60-meter (19.6 by 8.5-foot) platform that can be extended to 4.5 meters (14.8 feet) wide. Steel tracks and a hydraulic self-leveling frame keep the platform steady in uneven terrain. To meet Canadian regulations, van der Burg adjusted the bar spacing in the interlocked gates and reduced the overall width of the unit to below 2.60 meters (8.5 feet). The machine, and the platform, can be guided via radio remote control.

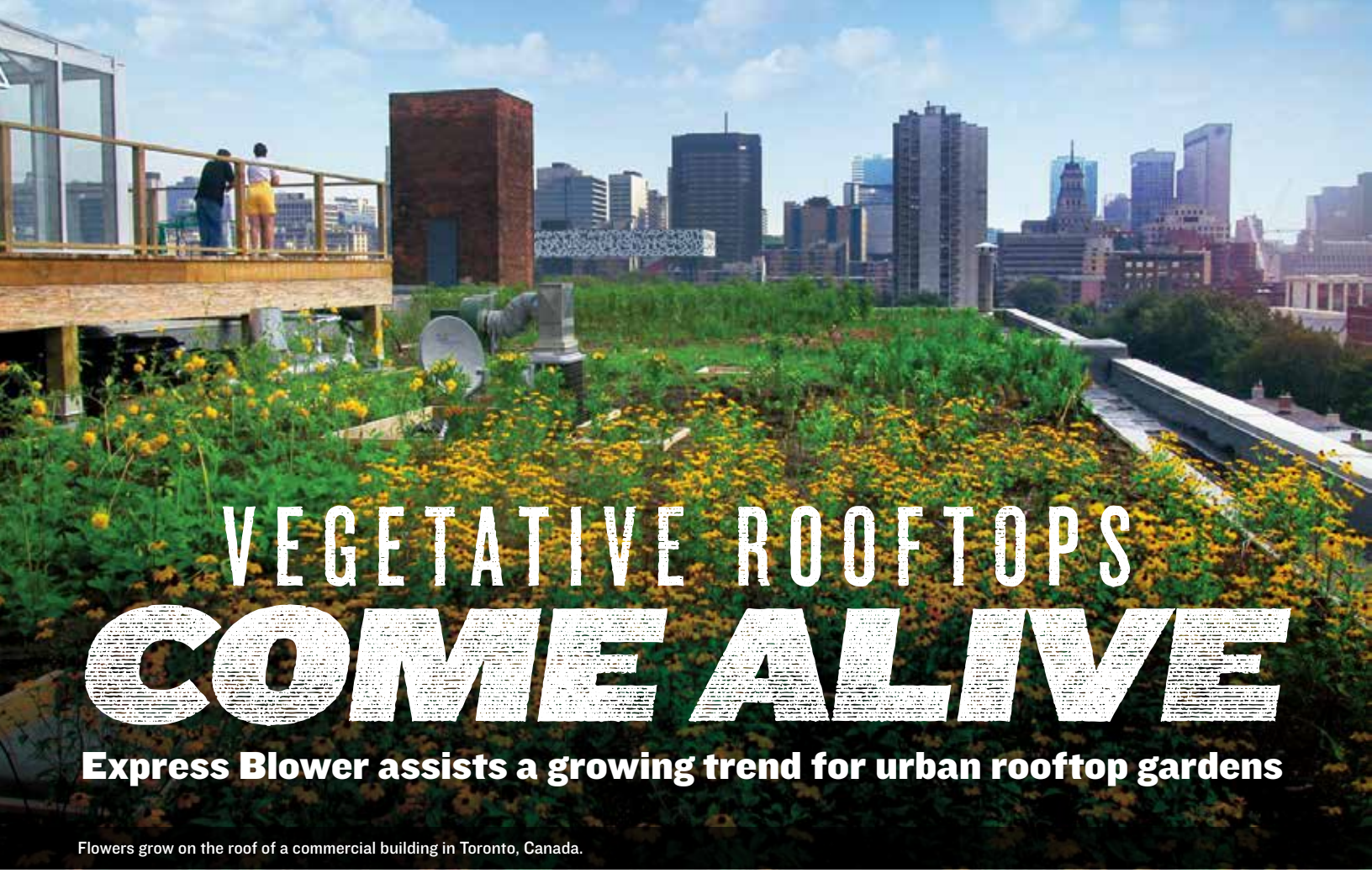
Ready to run

Canada also has stringent emissions standards, so a Final Tier 4/Stage IV engine was a must.

John Deere engine distributor for Benelux NPS Diesel B.V. supplied a complete, ready-to-install power pack, including a PowerTech™ PWL 4.5L engine equipped with an Integrated Emissions Control system configured with selective catalytic reduction (SCR), a diesel oxidation catalyst (DOC), and cooled exhaust gas recirculation (EGR). "The greenhouse construction industry here has been slow for almost a decade. Now that it is picking up we are pleased to have a partner like NPS. Their customized power solution and integration support enable us to use the latest emissions technologies without trial and error."

Distributor: NPS Diesel B.V. in Ravenstein, the Netherlands; *www.npsdiesel.com*

A. van der Burg Machines & Constructie have used John Deere engines since 2003. "They are extremely reliable and easy to service," says Arjan van der Burg.



VEGETATIVE ROOFTOPS COME ALIVE

Express Blower assists a growing trend for urban rooftop gardens

Flowers grow on the roof of a commercial building in Toronto, Canada.

Green roofs are growing in more ways than one, as more commercial businesses are opting for green vegetation over traditional flat-roof materials on both new and existing buildings.

They have long been popular in Europe, especially in Germany, Switzerland, and France. Now many North American cities are livening up their rooftops, including Chicago, Cincinnati, New York City, Portland, Seattle, Toronto, and Washington, D.C. A survey released by the Green Roofs for Healthy Cities (GRHC) reports that corporations recorded 889 projects in 40 U.S. states and six Canadian provinces in 2016. In fact, the U.S. capital is home to an impressive array of rooftop gardens and has set a goal of 20 percent green roof coverage by 2020.

The popularity of green roofs is being fueled by tax incentives, but also by economic and environmental benefits. Soil and vegetation helps insulate roofs, keeping buildings cooler in the summer and warmer in the winter. Plus, green roofs dramatically reduce storm water runoff. Consider the fact that rainwater hitting a traditional roof flows into gutters and eventually into storm drains. In a green roof environment, that water is captured and utilized for nurturing plant growth.

Green roofs are also becoming faster, easier, and more cost-effective to construct. Loading heavy soil onto rooftops of multi-story buildings once required moving bagged or bulk soil mix to rooftops by crane, man-lift, or service elevator. Today, more construction crews are using high-powered blowers and hoses.

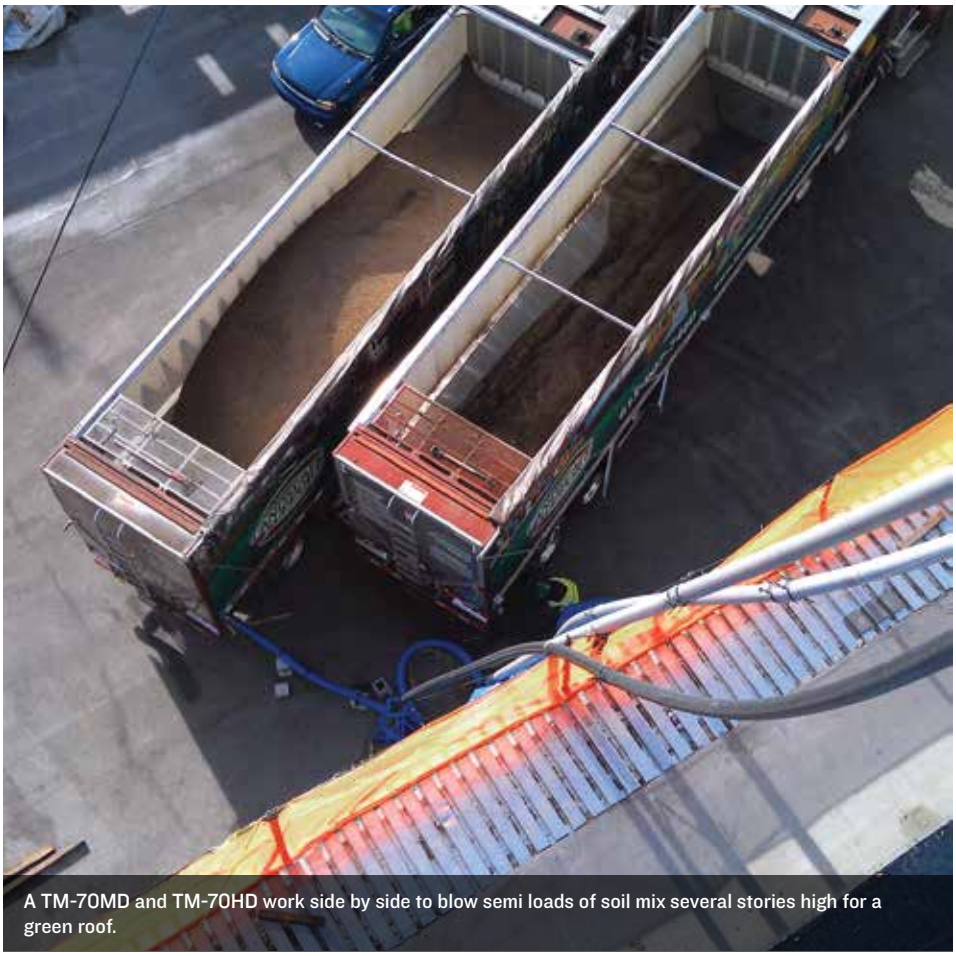
Express Blower, Inc., of Fairfield, Ohio, manufactures a range of equipment used for the construction of green roofs. The company's truck-mounted machines include five self-contained models powered by a dedicated John Deere diesel engine. Two models feature a material box about 34 cubic meters (45 cubic yards) in size, and two larger models hold about 53.5 cubic meters (70 cubic yards) of material. The fifth model is a high-powered compact skid-style unit.

Express Blower's medium-duty and heavy-duty models are ideally suited for green roof construction. Using long stretches of hard pipe or hose, they can deliver soil and aggregates to rooftops more than 30 stories high and place the material right where it's needed — no extra handling required.

The mighty machines were used in the construction of several large green-roof projects, including the Target Center, a multi-use arena home of the NBA's Minnesota Timberwolves. In Ohio, they installed green roof material atop the Liberty Center shopping complex in Fairfield.

Back at ground level

Express Blower equipment has long been used for landscaping, erosion control, and seeding. In addition to soil mixes, the machines can blow mulch, soil blends, composts, and aggregates into place. The company also holds a patent for a supplemental injection system that allows the calibrated injection of seed, fertilizer,



A TM-70MD and TM-70HD work side by side to blow semi loads of soil mix several stories high for a green roof.

A soil and seed mix is applied to establish a green roof. The growing medium is blown over a waterproof membrane.

and granular additives into the stream of soil. This "blown-in" application, called Terraseeding®, is a fast way to achieve quick germination over large areas, making it ideal for erosion control and the establishment of new lawns and wildflower beds. Terraseeding can also be used on rooftops. "There are different types of green roofs," explains Jason Wedmore, national account manager for Express Blower, Inc. "There are those with a thin layer of soil and drought-tolerant sedum plants, and then there are fully landscaped rooftops with walkways and courtyards. Our customers have found pretty diverse ways to use the blower trucks, and having high-horsepower engines powering our machines gives them a lot farther range."

After years of powering its equipment with a competitive engine model, Express Blower recently transitioned to John Deere Final Tier 4/Stage IV engines. The PowerTech™ PSS 6.8L engine powers two medium-duty (MD) models — the TM-45MD and TM-70MD. The PowerTech PSS 9.0L engine powers the company's two heavy-duty (HD) models — the TM-45HD and TM-70HD — as well as the new SKHD, a heavy-duty, skid-style unit.

"Our customers have found pretty diverse ways to use the blower trucks, and having high-horsepower engines powering our machines gives them a lot farther range."

— Jason Wedmore, Express Blower, Inc.

The recent switch to John Deere follows suit of its sister company, FINN Corporation of Fairfield, Ohio, which has been powering mulch blowers and HydroSeeders® with John Deere engines since 1975. Both companies purchase John Deere engines from Superior Diesel in Rhinelander, Wisconsin.

Superior Diesel provided engineering assistance during Express Blower's recent transition to Final Tier 4/Stage IV. "Because of the increased size of the components, we had to get much more creative in the packaging of our unit," says Brendan O'Connor, product manager for Express Blower, Inc. "The support of both John Deere and Superior Diesel has helped us immensely in doing all of that engineering work. The service has been outstanding."

Both companies sell blowers internationally and rely on the John Deere global network of dealers to support customers overseas. "During the process of searching for a new engine supplier," says O'Connor, "we received positive feedback from customers about John Deere. The international support network of dealers seems to be better than our past engine suppliers. We know that our customers are going to have good service and support from John Deere."

Distributor: Superior Diesel in Rhinelander, Wisconsin; *www.sdiesel.com*

A 'MASTER CLASS' IN RECYCLING

For both the RM 100GO! and RM 120GO!, customers can choose between a PowerTech Plus 9.0L Tier 3/Stage III A or a PSS 9.0L Final Tier 4/Stage IV engine.

Rubble Master's RM 100GO! and RM 120GO! crush recycling industry expectations

Recycling has clear value for the planet, but Rubble Master GmbH makes sure it creates value for businesses as well. This Austrian company specializes in impact crushers that turn mobile rubble recycling into a revenue-generating activity for companies of any size. And its latest RM 100GO! and RM 120GO! units, powered by John Deere Final Tier 4/Stage IV engines, are literally "crushing it" in a myriad of applications — and opening new opportunities.

Rubble Master GmbH has used John Deere engines since 2005, allowing it to naturally evolve alongside in terms of emissions regulations. "We're pioneers in our field and aim to have a global impact; we see these same qualities in John Deere. John Deere has a good reputation and a high-quality product that has proven reliable for us, even in tough applications, for over a decade," says Gerald Hanisch, CEO.

Originally designing solutions for entry-level crushing, Rubble Master has never stopped developing its product line. But it always combines simplicity and productivity with power and output, comments Heinz Jank, research and development manager. "Our mobile compact crushers offer great weight-to-size ratio and excellent throughput capacity. Yet they can be operated with the touch of a button, without in-depth technical knowledge. Combining reliability, productivity, and efficiency to keep operating costs very low is critical to create value in the competitive recycling sector."

The company's drive for excellence has resulted in some industry surprises. "We demonstrated that a Rubble Master impact crusher can even process hard stone — usually the job of a jaw or cone crusher. And, in certain applications, a single Rubble Master crusher can do the work of two other

crushers processing material," explains Shaun Montgomery, sales manager.

The new RM 100GO!: concretely different

"Customers are astounded by what the RM 100GO! can process, in materials as well as throughput," Montgomery continues. The RM 100GO! has a throughput of up to 250 tons per hour, but weighs only 29 tons. This star of the Rubble Master range can crush mineral materials, including construction and demolition (C&D) waste, concrete, asphalt, glass, coal, natural rock, and even reinforced concrete for production of high-quality construction materials. The RM 100GO! is available with a John Deere PowerTech™ Plus Tier 3/Stage III A or a 235-kW (315-hp) PSS 9.0L Final Tier 4/ Stage IV engine, depending on the customer's location and application.

Breaking ground with the RM 120GO!

Boasting outstanding performance, high output, and excellent final aggregate quality, the RM 120GO! has catapulted Rubble Master into a new league. "Customers asked for a bigger version of our crushers to compete with other heavier crushers," says Montgomery. "But of course, we gave it our own spin, designing a unique machine from the first brushstroke to the final design." The flagship of the company, the RM 120GO! offers an output of up to 350 metric tons (386 U.S. tons) per hour. As it weighs only 35 metric tons (38.6 U.S. tons), it can still be transported on a flatbed trailer. Handling numerous applications, the RM 120GO! has even opened up a new market for Rubble Master: the mining sector.

The RM 120GO! features new solutions, including a release system that ensures an even more homogeneous final aggregate in regular operation and impact plates that enable the operator to switch between recycling and natural stone applications quickly. Customers can choose between a PowerTech Plus 9.0L Tier 3/Stage III A or 286-kW (386-hp) PSS 9.0L Final Tier 4/ Stage IV engine.

The RM 100GO! crushes natural rock in Perth, Australia.

The RM 120GO! enables contractors to recycle asphalt quickly and efficiently.

In it for the long haul

"Our reasons for using the John Deere engines are similar for both the RM 100GO! and RM 120GO!," concludes Jank. "The dynamics of a crusher require a good engine response to maintain a constant speed at highly fluctuating load. These engines deliver that."

Rubble Master sees John Deere engine distributor Hamilton AG in Lauterach as a true, long-term partner. "They always provide us with detailed technical information on the engines and about the Final Tier 4/Stage IV powertrain technology. They show great flexibility in scheduling engine approvals and warranties. We are pleased to work with John Deere and Hamilton AG and are looking forward to a long, mutually beneficial relationship."

RM GO! SMART SERVICE TOOL

Another Rubble Master innovation is the RM GO! SMART software tool that saves customers downtime and unnecessary costs. Integrating mobile devices such as smartphones and tablets in the infrastructure of Rubble Master impact crushers, the system enables remote maintenance regardless of network coverage. All required machine parameters are displayed, allowing customers to monitor machine performance and carry out troubleshooting routines easily.

Distributor: Hamilton AG in Lauterach, Austria; ***www.drivingsolutions.ch***

A WINNING COMBINATION

Dallas Cowboys score with a Gen-Tech generator set powered by a John Deere engine

Nothing beats the sound of diehard fans in a packed football stadium, and that's certainly the case with football in Texas. From season passes to signed jerseys, Cowboys car wraps, and even the occasional naming of first-born children after one of the legendary players, Dallas Cowboy fans show that Texas football is no exception to the saying "everything is bigger in Texas"— especially when it comes to team spirit.

To show their appreciation, in 2009 the Cowboys started the "Cowboys on Tour" mobile program that travels state to state, giving back to their loyal fans and sponsors. The caravan includes two luxury buses and the legendary Dallas Cowboys Hall of Fame trailer, measuring in at 16 meters (53 feet) long, 4 meters (13 feet 6 inches) tall, and 2.4 meters (8 feet) wide.

The first thing to catch fans' eyes when they step inside the trailer is the collection of trophies and rings on display. The trailer is split into four sections: one dedicated to the current team, with items such as Dak Prescott's quarterback towel, Jason Witten's gloves, and the team picture. The next section is all about the Jones family foundation and their charitable work. You can stroll down memory lane with the original 1960s Cowboys. There you'll find a Tom Landry statue — a favorite piece of memorabilia of the trailer's driver, Charles Boltas. All eyes also behold America's

The Dallas Cowboys Hall of Fame trailer tours state to state, giving Dallas Cowboy fans a peek into the team's present and past.

sweethearts — the Dallas Cowboys Cheerleaders — in the final section of the trailer. Boltas claimed this "mobile museum's" main purpose is to educate people about the team and its history. It also brings the fan experience to those who haven't seen the Dallas Cowboys memorabilia in person.

When it came to repowering their trailer, Boltas says he wanted a generator driven by an engine "capable of matching the caliber of the Dallas Cowboys."

Their top pick? John Deere. Specifically, a PowerTech™ E 4.5L generator drive engine.

Searching for the right engine, Boltas first contacted Gen-Tech, the Georgia company that supplied the original generator set for the Hall of Fame trailer in 2009. The Dallas Cowboys wanted their Hall of Fame trailer back on the road as quickly as possible, and to accomplish this required a team effort. Gen-Tech worked with Cal-Coast Machinery (a John Deere dealer that supplies the Cowboys training camp with Gator utility vehicles) and John Deere engine distributor, Flint Equipment Company, to expedite the order and assembly of the engine at Motores John Deere, the John Deere engine factory in Torreon, Mexico.

"With the clock ticking down, we didn't have a lot of time to pull this together, but we did and did it successfully," says Eric Sosa, sales manager for Gen-Tech. "With the time crunch, John Deere Power Systems didn't blow us off because Gen-Tech is a nine-person company. John Deere met the challenge."

It was a win-win for everyone involved, says Boltas. "The great thing about it was everyone worked together to make this happen, just like a team. Everyone that helped was a part of this victory."

Distributor: Flint Equipment Company in Albany, Georgia; *www.flintequipco.com*

Mounted behind the cab, the 60-kWe John Deere–powered generator powers the lights and air conditioning, as well as the hydraulically powered awning and slide-outs.

Flint Equipment Company supplied the PowerTech E 4.5L gen-drive engine for the Hall of Fame trailer.

The Dallas Cowboys Hall of Fame trailer is filled with memorabilia, including trophies and rings.

Barco Pump's Turnkey Solutions Division quickly accomplished construction of a temporary pump station utilizing six Gorman-Rupp PAI2A Silent Pumps with high-density polyethylene (HDPE) suction and discharge piping. The 30.5-centimeter (12-inch) pumps are powered by John Deere PowerTech Plus 6.8L engines.

RAPID RESPONSE

John Deere and its OEM customers support many communities affected by hurricanes

Hurricanes Harvey, Irma, and Maria pounded the U.S. mainland and the Caribbean islands this past fall, resulting in unprecedented flooding and widespread devastation. Yet in the wake of the hurricanes, stories emerge of people and companies rallying to help storm victims.

The three monster storms made landfall over the course of four weeks. Hurricane Harvey unleashed its wrath on southeast Texas and southwest Louisiana for nine days, bringing upward of 127 centimeters (50 inches) of rain in some areas. Hurricane Irma — maintaining 290-kilometer-per hour (180-mile per-hour) winds for 37 hours — hit Florida after cutting a swath of destruction through the Caribbean, setting a record for the most intense storm for such a long duration anywhere on earth. Then Hurricane Maria thrashed the Dominica and Puerto Rico, with winds over 160 kilometers per hour (100 miles per hour) and more than 76 centimeters (30 inches) of rain, causing a major humanitarian crisis.

The road to recovery will take months, if not years. To support those rebuilding and healing, John Deere and many of its engine customers donated money and deployed equipment to disaster-stricken areas.

John Deere donated $1 million to support Habitat Hammers Back, a long-term recovery initiative organized by Habitat for Humanity International to help and rebuild communities ravaged by the storms. The donation is in addition to the John Deere Foundation's annual $500,000 donation to the American Red Cross Annual Disaster Giving Program. John Deere employees also contributed more than $100,000 to the Red Cross, food banks, and other aid organizations. In addition, John Deere business divisions and dealers across the country deployed heavy equipment and organized drives to collect donations.

Equipment manufacturers across the country used John Deere engine power to assist flood-ravaged communities.

Multitek North America LLC of Prentice, Wisconsin, worked diligently to ship John Deere–powered generator sets to hurricane-affected regions in Texas and Florida. "We had been watching the strength of the hurricanes building up before they hit, so we were reaching out to our distributors in the coastal areas to let them know that we were there to help them in any capacity that we could, from our generators to our flameless ground heaters, we had inventory ready to ship immediately and production slots to accommodate additional orders from the storm," states Matthew Rabe, vice president of Midwest Sales. The generators supplied power to stores, hotels, and clinics.

Rain for Rent of Bakersfield, California, delivered and installed three DV600c 762-millimeter (30-inch) pumps powered by PowerTech™ Plus 13.5L engines, along with suction and discharge pipe, to construct a temporary pump station in Beaumont, Texas. "The Lower Neches Valley River

After Hurricane Harvey, Rain for Rent of Bakersfield, California, delivered and installed DV600c pumps powered by PowerTech Plus 13.5L engines in Beaumont, Texas.

Beaumont, Texas, required a 37,541-liters/minute (100,000-gallons per minute) bypass pumping system to replace the primary pumping station overcome by severe flooding from Hurricane Harvey.

Apex Pump & Equipment deployed many pumping units in the Houston area, including this trailer-mounted Pioneer pump driven by a PowerTech Plus 9.0L engine.

A PowerTech E 4.5L drives an 80-kWe Stamford generator on the Multitek MG80.

Multitek supplied MG80 and MGII2 generators to flood-stricken areas of Texas and Florida.

Authority required a 378,541-liters-per-minute (100,000-gallons-per-minute) bypass pumping system to provide the City of Beaumont with water while the primary pumping station was repaired, following flood damage from Hurricane Harvey," says Anna Porter, Rain for Rent's corporate communication specialist.

Barco Pump's Turnkey Solutions Division of Wylie, Texas, was contacted by Sienna Plantation, a residential community in Missouri City, Texas, for flood relief during Hurricane Harvey. Barco TKS quickly constructed a temporary pump station to remove floodwater from a residential community. The pump station comprised of six 30.5-centimeter (12-inch) Gorman-Rupp PA12A Silent Pumps powered by PowerTech E 6.8L engines. The system pumped 190 million liters (50 million gallons) per day discharging floodwater over the levy into the Brazos River, allowing residents to return to their homes as quickly as possible.

Apex Pump & Equipment dispatched many John Deere–powered pump units at the onset and during the recovery of Hurricane Harvey. The pumping units were used in a variety of applications from dewatering neighborhoods, preventing many homes from being flooded, to the recovery of refineries that were overtaken by floodwaters. "Several Apex team members also volunteered their time rescuing people by boat that were trapped by the floodwaters," says CEO David Walling. "Apex is honored to be a part of the solution during hardships brought upon South Texas from Hurricane Harvey."

Xylem, the manufacturer of Godwin pumps, deployed hundreds of pumping units to flooded areas. The company also pledged a substantial contribution to Mercy Corps to deliver humanitarian assistance to Puerto Rico. The company is working with Planet Water Foundation to fund the construction of 10 water towers in remote areas to bring clean water to several of the hardest-hit areas.

During and after the storms, other pump manufacturers from across the country reported a deployment of many rental pumping units. Among them were, Thompson Pump in Port Orange, Florida; Gorman-Rupp in Mansfield, Ohio; Pioneer Pump, Inc. of Canby, Oregon; and Premier Pump & Power, LLC of Vancouver, Washington. Companies also donated supplies, including W.S. Darley & Company, which assembled pallets of drinking water that were air-dropped to residents of Puerto Rico.

Distributors: Superior Diesel in Rhinelander, Wisconsin; *www.sdiesel.com;*

Western Power Products Inc. in Bakersfield, California; *www.westernpowerproducts.net;*

Bell Power Systems, LLC in Essex, Connecticut; *www.bellpower.com;*

Flint Equipment Company in Albany, Georgia; *flintequipco.com;*

Cascade Engine Center in Seattle, Washington; *www.cascadeengine.com;*

engines, inc., in Jonesboro, Arkansas; *www.enginespower.com.*

EXPERIENCE A "REEL" DIFFERENCE

John Deere Final Tier 4 engines deliver ample power and torque to Hogg & Davis cable pullers

Here's a riddle for you: What spends its days performing high-wire acts with 6 kilometers (4 miles) of rope?

If you guessed a tightrope walker, try again, because this is no circus act. Here's another hint: It easily pulls 4.5 metric tons (10,000 pounds) without even a grunt.

You got it: A Hogg & Davis ODP100PPS cable puller! Or perhaps you didn't. That's OK, too, because we'd like you to understand the power and precision that goes into stringing conductor cable on tall transmission towers.

After 70 years in the manufacturing business, Hogg & Davis knows a thing or two about building tensioners and pullers. The equipment is rugged-tough but also has curb appeal. "A lot of companies use T-channel and I-beams. Our units are built with rectangular tubing with rounded fenders made of 11-gauge steel," explains Scott Mason, who handles production development and support for Hogg & Davis. "The durability of our products is one of the better-known-things about us. They go out of here overbuilt with a 15-year warranty. They're very strong, but they look good, too."

The ODP100PPS is a single-drum puller. Tucked between the cab and large cable reel is a 104-kW (140-hp) John Deere PowerTech™ PWL 4.5L engine that hydraulically powers the leveling jacks, reel, and level line through a John Deere–manufactured Funk™ pump drive.

Hogg & Davis is a three-generation, privately owned company that began powering pullers and tensioners with John Deere engines two decades ago. Today, the John Deere engines are purchased through Cascade Engine Center. The Seattle-based John Deere engine distributor adds value by packaging the engine as a complete power unit with a sound-attenuated enclosure that's powder-coated white.

This is the first Hogg & Davis cable puller driven by a Final Tier 4/Stage IV engine. Mason says the PWL 4.5L engine is quick-starting and runs quiet. "The Final Tier 4 engine is pretty cool. We can start up the engine in the shop and nobody notices it."

The ODP100PPS is the smallest drum puller in the company's product line with a programmable pulling system. This allows operators to preset the tension prior to pulling, safeguarding both the equipment and the workers. Applying too much pull can not only damage the conductor cable, towers, and hardware, but can also result in broken cable, which can potentially injure linemen working below.

Mason says the ODP100PPS is suited for light transmission work and satisfies the industry demand for more rope and pulling power. "Many of our customers want more capacity for rope; they want more and more cable but they want to keep the same pull."

Pulling longer lengths of rope requires torque. The 104-kW (140-hp) PWL 4.5L produces peak torque at 1600 rpm. Even at 1500 rpm, Mason says the engine delivers plenty of pulling power. "It will pull 10,000 pounds (4.5 metric tons) of rope at a rate of 4 miles per hour (6.4 kilometers per hour) — easy," says Mason. "The engine doesn't vibrate and it's pretty quiet. In our industry, less noise pollution is important, because an operator must sit on the machine for hours at a time."

Having service and support through the John Deere dealer network is important for equipment operators, too. "With 34 employees, we're smaller than what a lot of people realize and they're sometimes surprised that we don't have a service department," says Mason. I like knowing that if there's a problem with an engine, finding a John Deere dealer is pretty easy. You can't say that for all the engine manufacturers out there."

Distributor: Cascade Engine Center in Seattle, Washington; *www.cascadeengine.com*

Driven by a PWL 4.5L, the ODP100PPS is the first Hogg & Davis cable puller driven by a Final Tier 4/Stage IV engine.

SUCCESS ROOTED IN SIMPLICITY

A John Deere engine powers a hydrostatic drive that propels the machine and runs the 2.4-meter (8-foot) broom head and optional components, such as a scraper blade.

Broce's original, durable broom design continues to stand the test of time

Broce Manufacturing's success story began in 1963 when Ray C. Broce, a highway contractor, manufactured the first self-propelled sweeper. Fifty-five years and some 15,000 machines later, the Oklahoma City manufacturer sweeps the world over with its mid-mount, self-propelled brooms. Its current model, the Broce Broom RJT-350, embodies many qualities of Broce's original design but with a new engine. Terry Wimer, vice president of sales and marketing, talks about the value of keeping things simple and its recent move to Final Tier 4/Stage IV engines.

PowerSource: Broce Manufacturing has been building construction and industrial-style sweepers and brooms for decades. The Series 350 sweeper specifically has stood the test of time as one of the industry's most popular — without a whole lot of changes.

Wimer: Yes, there's beauty in keeping your product line simple. We've made improvements over the years, but sticking to one model simplifies production and gives us better control over quality.

PowerSource: Your brooms are sold to road contractors and government agencies around the globe. Over the past 55 years, what have you found to be the most important feature that customers want in a sweeper?

Wimer: It's a harsh and difficult environment, and contractors need to have something that's going to be durable and dependable. Power and torque are also essential. At the end of the day, a guy wants to do the job, and that's the priority. In my opinion, it's the performance of the engine that's key.

PowerSource: John Deere engines have powered Broce Brooms since 1983. How well do they do in these harsh conditions?

Wimer: John Deere engines have held up very well. If an engine is cared for properly, we have no engine problems.

PowerSource: After moving through each rising emissions tier with John Deere engines, you recently went into production of RJT-350 sweepers with Final Tier 4/Stage IV engines. How did the transition go?

Wimer: Very seamless. You'd think something this dramatic would cause more ripples than it did. The credit goes to John Deere for having their ducks in a row and having good people to iron out the details.

PowerSource: Your John Deere engine distributor, Industrial-Irrigation, helped in the transition, right?

Wimer: Yes, we shipped an RJT-350 to their facility in Hastings, Nebraska. Our experience with Industrial-Irrigation has always been good. They rank among the top suppliers that we deal with. They are really good people.

PowerSource: A 74-hp PowerTech™ EWX 4.5L engine powers the RJT-350. Did this require a redesign?

Wimer: No. The EWX 4.5L Final Tier 4 engine is bigger than the Interim Tier 4 engine, but we're using the same frame that we've been using.

PowerSource: Over the years, what have you found to be the most important characteristics that people want in a sweeper?

Wimer: People like something that works and doesn't break down, or when it does, they can get it fixed as soon as possible. Our equipment is not real complicated. It's easy to work on and maintain. There's a lot of off-the-shelf componentry that makes it convenient for them to source locally, if they're in a pinch.

PowerSource: And you have seasoned employees, like yourself, who come to the table with decades of experience in the business.

Wimer: We have a good idea of what people need and what works for them. We're willing to listen. The main thing Broce Manufacturing does right is customer service; it's done a good job of responding to customers' needs over the years.

Distributor: Industrial-Irrigation Services in Hastings, Nebraska; *www.industrial-irrigation.com*

The Vermeer D40x55DR S3 Navigator features a dual-rod (rod inside a rod) drill stem. The inner rod powers the downhole tri-cone as the outer rod provides steering and back-reaming rotation.

ROCK STAR

Vermeer Corporation takes center stage with a horizontal directional drill that delivers a stellar rock performance underground

Rock constitutes much of the earth's dry surface; and while its hard properties provide a stable, firm foundation for building infrastructure, it can create challenges for construction contractors responsible for laying underground utilities and pipeline.

Sing those blues no more, because Vermeer Corporation of Pella, Iowa, is rocking it with the Vermeer D40x55DR S3 Navigator — the latest addition to Vermeer's family of horizontal directional drills (HDDs).

The Vermeer D40x55DR S3 Navigator is not labeled for just rock. The versatile performer takes on a wide range of soils with equal enthusiasm. Contractors will applaud its 177.9 kilonewtons (40,000 pounds) of thrust and pullback and 7,458 newton-meters (5,500 foot-pounds) of rotational torque.

The HDD features a dual-rod (rod inside a rod) drill stem. The inner rod provides torque to the drill bit, while the outer rod offers steering capability and rotational torque for reaming. The combination provides powerful downhole cutting action. A more simplified rod joint design and rotational gearbox are just two new improvements that are expected to speed the process of connecting rods to the drill string.

"It's critical when you do these installations that you have good, solid support."

— Edwin Galloway, Vermeer

The ensemble

A 104-kW (140-hp) John Deere PowerTech™ PWS 4.5L Final Tier 4/Stage IV engine hydraulically drives the drill's functions, including the mud pump and track drive. Northstar Power Products supplies the engines and engineering assistance. "It's critical when you do these installations that you have good, solid support," says Edwin Galloway, senior project engineer at Vermeer. "Northstar provided 3-D CAD designs that helped us position the DEF (diesel exhaust fluid) tank and route the aftertreatment system. "Fortunately, we had room, so it wasn't too arduous."

Vermeer Corporation, Northstar Power, and John Deere are a trio that's been performing together for nearly two decades and across several Vermeer product lines, including horizontal directional drills, trenchers, wood chippers, and more recently, concrete saws.

Distributor: Northstar Power LLC in Ankeny, Iowa; *www.northstarpowerllc.com*

A 104-kW (140-hp) PWS 4.5L engine hydraulically drives the Vermeer D40x55DR S3 Navigator.

A POPULAR REMAKE

The CC155 returns with a John Deere Final Tier 4 engine

Vermeer Corporation recently reintroduced its CC155 concrete cutter into the marketplace — this time with a Final Tier 4 engine. Drawing on the sustained torque output of 116-kW (156-hp) PowerTech 4.5L engine, the 213-centimeter-diameter (84-inch-diameter) cutting wheel has the power to cut to a maximum depth of 79 centimeters (31 inches). The compact, powerful machine is a natural for cutting streets for utility installation or for pothole repairs. It's also equally adept at cutting and repairing joints on interstate highways and bridges, installing longitudinal roadway drains, airport and street lighting, as well as demolition work.

BREATHE EASY

BW Manufacturing's D-1800 makes cleaner, easier work of preparing concrete surfaces

Crystalline silica is one of the most abundant minerals on earth and a valuable component in many construction materials from concrete to brick. Yet when pulverized by cutting, sawing, or grinding, the resulting airborne dust can be a respiratory health hazard if not contained and controlled.

On Sept. 23, 2017, the National Institute for Occupational Safety and Health Administration (OSHA) issued new standards to limit worker exposure to respirable crystalline silica.

BW Manufacturing of Comstock Park, Michigan, is proactively working to help minimize operator exposure to crystalline silica with the D-1800 — a surface preparation machine that systematically contains the dust generated when working surfaces like concrete.

The D-1800 is a ride-on machine that prepares the surface of industrial floors, bridge decks, parking decks, highways, airport runways, and hangers. It's available with three interchangeable attachments — a scarifying head, shotblast attachment, or diamond grinder/polisher — making the D-1800 adaptable for a variety of surface-prep jobs.

Shotblasting has been used in the industrial flooring market and on roadways and bridge decks for more than 35 years. It's also the most popular attachment on the D-1800, says Darrel Miller Jr., the company's general manager. Instead of using harsh chemicals or acids, shotblasting employs a rapidly rotating blast wheel that sends steel shot striking the concrete surface at high velocities. Plus, the shot is recycled to the blast wheel repeatedly, while the dust and debris are transferred to a dust bin with the help of a high-powered vacuum. Filters are continuously cleaned with sequential compressed air pulsation to ensure continuous removal and containment of crystalline silica from the environment.

"We have machines with over 4,000 hours on the original engine, which says a lot."

— Darrel Miller Jr., BW Manufacturing

Gone are the days of having to manually unload the dust bin. The D-1800 features a hydraulic dump box that allows the operator to safely dispose of the dust.

To comply with Final Tier 4/Stage IV emissions, the company recently launched the D-1800 with a John Deere PowerTech™ EWX 4.5L engine.

Superior Diesel provided BW Manufacturing with a complete power unit. The John Deere engine distributor mounted a Twin Disc clutch on the PTO and installed an air compressor.

Transitioning from John Deere Interim Tier 4/Stage III B engines to the next level of emissions required minor modifications to the hood to accommodate the particulate filter, says Miller. "Steve Kimbell, our sales rep for Superior Diesel, worked with us through the whole process, verifying the fitments, suggesting changes, and approving the changes we made. Steve and the others at Superior Diesel have been very helpful."

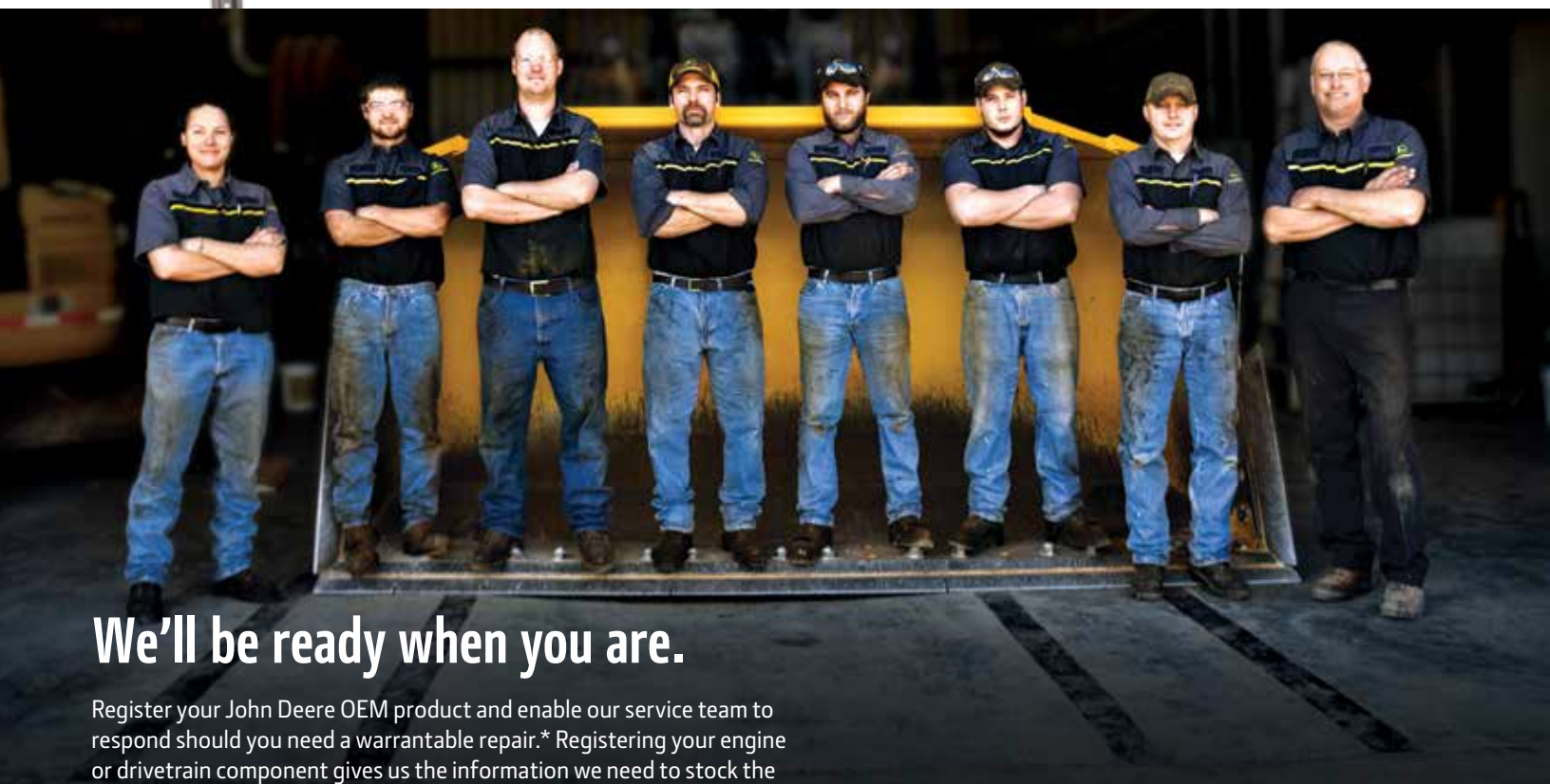
BW Manufacturing unveils the D-1800 with an EWX 4.5L engine. The D-1800 delivers an 18-inch-wide blast and features interchangeable heads for scarifying, shotblasting, and diamond grinding/polishing.

BW Manufacturing was founded in 1996 and its surface preparation equipment has been John Deere–powered for years with good success. "We have machines with over 4,000 hours on the original engine, which says a lot for the reliability of the John Deere engine and the BW Manufacturing equipment in this work environment."

Distributor: Superior Diesel in Rhinelander, Wisconsin; *www.sdiesel.com*

LOOK FOR JOHN DEERE ENGINES AT THESE UPCOMING TRADE SHOWS, CONVENTIONS, AND EXHIBITS.

March 6 – 8, 2018	MIDDLE EAST ELECTRICITY	Dubai, UAE
March 13 – 16, 2018	BAUMA CONEXPO AFRICA	Johannesburg, South Africa
April 23 – 28, 2018	INTERMAT	Paris, France
April 30 – May 3, 2018	OFFSHORE TECHNOLOGY CONFERENCE	Houston, Texas, USA
May 8 – 10, 2018	AUTOSTRADA	Kielce, Poland
May 24 – 26, 2018	MASKINEXPO	Stockholm, Sweden
June 5 – 8, 2018	BAUMA CTT	Moscow, Russia
June 12 – 14, 2018	GLOBAL PETROLEUM SHOW	Calgary, Canada
June 13 – 15, 2018	GENERA	Madrid, Spain
June 19 – 21, 2018	POWER-GEN EUROPE	Vienna, Austria
June 26 – 28, 2018	HILLHEAD	Buxton, UK
June 26 – 29, 2018	ENERGY LEBANON	Beirut, Lebanon
July 17 – 19, 2018	POWER-GEN AFRICA	Johannesburg, South Africa
September 11 – 13, 2018	HUSKER HARVEST	Grand Island, Nebraska, USA
September 18 – 20, 2018	POWER-GEN ASIA	Jakarta, Indonesia
November 6 – 9, 2018	KEY ENERGY	Rimini, Italy
November 7 – 11, 2018	EIMA	Bologna, Italy
December 4 – 6, 2018	POWER-GEN INTERNATIONAL	Orlando, Florida, USA



We'll be ready when you are.

Register your John Deere OEM product and enable our service team to respond should you need a warrantable repair.* Registering your engine or drivetrain component gives us the information we need to stock the right service parts, maintenance products, and servicing tools.

Register the warranty for your John Deere OEM engine or drivetrain component at **JohnDeere.com/OEMWarranty.**

*See specific OEM product warranty language for applicable terms and conditions.

JOHN DEERE

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John Deere Power Systems

With every turn of the wheel, every push of the controls, and every project completed — you're reminded why you chose John Deere engine power and drivetrain components in the first place. John Deere power components faithfully do their jobs with performance that responds to each command, uptime delivered day after day, and low cost of operation proven year after year. We make experiences you have with our engines and drivetrain components count, right down to the reliable support you receive at more than 4,000 service locations worldwide.

That's the John Deere experience.

JOHN DEERE

JohnDeere.com/jdpower

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