GE Power

ALWAYS

ON

DISTRIBUTED
POWER

You don’t stop, so we don’t either

Engines that are powering the world

We’re always on ... with the power you need, near or onsite, on and off the grid.

We’re always on ... with cleaner technologies that can transform your business – making you more cost-effective and helping to save the environment.

We’re always on ... with deep digital talent that sparks constant innovation, quickly and with agility. The digital thread that runs through everything we do – it’s in our DNA, after all! – makes it possible to continually improve your operation’s availability, reliability and performance.

We’re always on ... with life cycle services that can bring more value to your operations. Our Asset Performance Management solution uses big data to monitor and predict what you need, before you need it – and brilliantly revolutionizes your operations.

We’re GE Power’s Distributed Power. Jenbacher* and Waukesha* gas engines that can produce up to 10.38 MW. Engines that are heating and powering businesses and communities, and driving gas compression facilities, in more than 100 countries. ... And we’re nowhere near done.

Because you don’t stop, neither do we.

*Indicates a trademark of the General Electric Company

Always meeting your needs

The flexibility to support you – whatever your challenges, wherever they are

You'll find GE's Distributed Power technologies far from the grid, sometimes in remote locations where emergency power is needed quickly. And, you'll find us in urban settings that need fast and reliable backup power to counter both grid congestion and the fluctuations of renewable energy sources. Even data centers – one of today's fastest growing power segments – often choose small modular power as an uninterrupted energy supply for their cloud-based operations.

And that's only the beginning.

Jenbacher gas engines provide the flexibility you need, with a power range of up to 10.38 MW and the ability to run on natural gas or on numerous other gases. With more than 16,000 Jenbacher gas engines in operation, we furnish onsite power, heat and cooling for a variety of commercial, industrial and municipal applications in 100-plus countries. In fact, GE has one of the largest Combined Heat and Power installed bases of gas engines in the world!

Our 19,000 Waukesha gas engines were designed to perform reliably in isolated, mission-critical and demanding applications. Durable and flexible, our Waukesha engines meet emissions compliance levels in diverse applications around the globe. And, by offering both rich- and lean-burn designs, we provide a range of products to help you make smart choices for tomorrow.

Service that's always there

From commission and installation to conversions and upgrades, GE's global network of qualified experts is there with a wide array of outcome-oriented options. Big data runs through everything we do – from our always-innovating Brilliant Factories to our illuminative Asset Performance Management offerings.
We are always on, because you are.

More than
21 GW
16,000
Jenbacher gas engines

More than
15 GW
19,000
Waukesha gas engines

Service in more than **100** countries

With power ranging from 100 kW to 10 MW, our gas engines can meet your needs in all kinds of applications.

Cogeneration
Or Combined Heat and Power
- District heating and/or cooling
- Commercial buildings
- Community facilities
- Industry facilities
- Greenhouses and CO_2 fertilization

Alternative power
- Biogas
- Landfill gas
- Sewage gas
- Special gases

Oil & gas
- Oilfield power generation
- Processing
- Gathering
- Drilling/artificial lift
- Storage and re-injection
- Mobile/rental power

Fast/backup power
- Data centers
- Grid firming
- Demand response
- Mobile/rental power

Power generation
- Baseload and peaking
- Grid balancing

Always on your side

Putting your business first

With Distributed Power technology, you can be up and running in weeks. No need to wait for years to complete a large power project. No need to go without power should disaster strike. And, with our gas engines' quick starts and stops, you can efficiently back up your renewable energy sources, providing grid stability when you need it.

You'll achieve overall efficiencies of 90% or more with cogeneration (also called Combined Heat and Power, or CHP) and district heating and cooling. Yet, gas engines for gas and oil rigs can be found in the most remote places in the world, providing reliable power under the most demanding circumstances.

Concerned about expenses? Our lower installed costs and smaller increments open up more financing choices. Plus, we offer financing through GE's Industrial Financing.

Always greener

Helping you cut emissions and lower your carbon footprint

GE created the ecomagination initiative as our commitment to provide innovative solutions that make measurable differences and create sustainable outcomes – both for our customers and our own operations. Offering industry-leading emissions levels and reduced carbon footprints, many of our Distributed Power gas engines have passed the stringent ecomagination tests for efficiency and energy savings. A glowing example is GE's Waukesha 275GL*+, which is as uncompromising as the environment it's built for. And then there's the newest and largest Jenbacher gas engine, the J920 FleXtra, with its smaller carbon footprint and, at 49.9%, the highest electrical efficiency of any of our Jenbacher gas engines.

At GE, we're always working to solve some of the world's toughest environmental challenges.

More than **12 GW** generated by the Jenbacher cogeneration fleet,
enough to power **27 million** European homes.
That means avoiding **23 million** tons of CO_2,
the equivalent of taking **5 million** cars off European roads.

*Indicates a trademark of the General Electric Company

Always innovating

Meeting your challenges and improving your business performance

In the 100-plus years Distributed Power has been manufacturing products and providing service to our customers, we've never stopped improving. In fact, GE is investing tens of millions of dollars in our gas engine technologies to make them more efficient, flexible – and cleaner. Right now, more than 550 GE engineers across the globe are working on those technologies to increase your uptime while making your engines more efficient, with longer lives and shorter startup times.
If energy is our heritage, Digital is our future. There's a flow of information and goods that runs through everything we do, from our customers through our company to our suppliers – and back again. Through digitalization, we can constantly improve our products' design and construction in our Brilliant Factories, flawlessly execute our services, and move beyond reactive to predictive data solutions.

Always on for your success

Addressing your toughest challenges

New Jenbacher gas engine increases power and fuel efficiency

Challenge

HanseWerk Natur GmbH, a wholly owned subsidiary of HanseWerk AG, owns more than 70 Jenbacher cogeneration plants in northern Germany, but it wanted more from its next generator set – efficiency of at least 95% for a Combined Heat and Power (CHP) unit operating in a 60°C in/105°C out district heating system.

Solution

Inaugurated in November 2015, the showcase cogeneration plant at Stapelfeld in Hamburg is equipped with GE's largest gas engine-based generator set, the Jenbacher J920 FleXtra gas engine.

Results

With a power capacity of 9.5 MW, the J920 FleXtra achieves a combined fuel efficiency of 95% to 97%, thanks in part to two-stage turbocharging. Due to an innovative heat recovery system, the heat utilization results in 47% to 49% of the fuel input, and the electrical efficiency is increased to around 48%. The J920 FleXtra gas engine, which can reach full startup in less than five minutes, also is equipped with GE's myPlant* Asset Performance Management solution, a remote monitoring and diagnostic system for improved maintenance intervals of up to 40,000/80,000 hours.

Lower operating costs with fuel flexible Waukesha gas engines

Challenge

Our customers are always looking to lower operating costs with a "one-stop shop" for fuel flexible gas engines, air-fuel ratio (AFR) controls and after-treatment systems.

Solution

With that in mind, Keystone Drill Services (KDS) bought four pilot Waukesha VGF* engines to displace diesel engines owned by Dallas Morris Drilling (DMD) at Marcellus Shale, PA. GE's new Waukesha models provide a complete emissions solution through three-way catalyst and AFR control system technology – a combination that enabled the VGF to garner mobile and stationary certifications from the EPA.

Results

Because the Waukesha gas engines run on field gas available on site, operating and fuel expenses, as well as diesel fuel transportation and logistics issues, are significantly reduced. The new engines also produce lower emissions – including about 80% less NO_x – than typical diesels used in the industry.

Deployed in 2015, this project marked the first time KDS had packaged natural gas-driven air compressors, and the first use of EPA-certified natural gas engines for air drilling applications.

Waukesha gas engine just keeps running ... and running ... and running

Challenge

When the town of Porvenir, the capital of the province of Tierra del Fuego in Chile, needed to boost its power generating capacity, the regional electric company, EDELMAG, turned to GE and our Waukesha gas engines. And why not? With more than 235,000 hours of continuous operation, a Waukesha VHP* generator set has powered the entire town since 1982, and is still fully operational and in an excellent state of repair.

Solution

Particularly well-suited to isolated sites and critical power-generating plants, the engine is part of GE's line of 12-cylinder VHP gas generators designed for longevity and reliable operation under a wide range of gaseous conditions. Apart from a new control system installed in 2002, the unit is still running with most of its original components, and has been shut down only for scheduled maintenance by EDELMAG staff with Waukesha support. To put that in perspective: Stationary operation of the engine for 235,000 hours is equivalent to driving a car at 35 mph (56.3 km/h) for 8.22 million miles (13.2 million kilometers).

Results

EDELMAG since has purchased two additional Waukesha VHP 9390 GSI generators, increasing production of electricity by gas to 3.275 MW to meet Porvenir's growing demand for electricity.

*Indicates a trademark of the General Electric Company

On-site energy a hallmark of NYC's Hudson Yards

Challenge

With 17 million square feet of commercial and residential space, New York City's Hudson Yards is the largest private real estate development in US history. Innovating on the energy front, it needed an experienced team that could design and deliver a complete Combined Heat and Power (CHP) solution.

Solution

The 13.2 MW CHP system delivered in 2016 by Northeast Energy Systems will generate electricity on site, and the heat from four of GE's Jenbacher J620 gas engines will produce hot and chilled water for Hudson Yards' buildings. A single Jenbacher J620 gas engine generates roughly 3.3 MW of electrical power while also generating approximately 11 MMTBU per hour of recoverable thermal energy.

Results

The project has been lauded by the Engineer of Record, who says, "the best way to succeed is with an experienced team that can work together to solve problems and drive the project to completion."

Always everywhere

A wide range of reciprocating engines

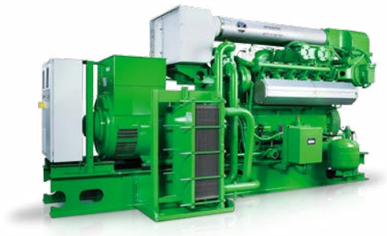
GE's Distributed Power product portfolio

Jenbacher Type 2

Introduced in 1976 and continuously improved upon, GE's Jenbacher Type 2 gas engine offers extremely high efficiency in the 250 to 330 kW power range. Its robust design and stationary engine concept result in excellent component durability and a service life of 80,000 operating hours before the first major overhaul. Enhanced components and a proven control and monitoring model give the Type 2 engine outstanding reliability.

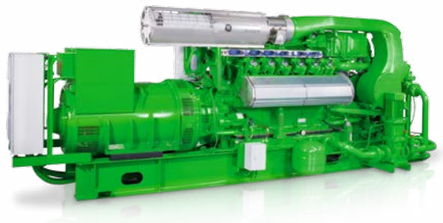
Jenbacher Type 3

Technical maturity and a high degree of reliability make GE's Jenbacher Type 3 gas engine a leader in the 500 to 1,000 kW power range. Long service intervals, a maintenance-friendly engine design, and low fuel consumption help ensure excellent efficiency. Enhanced components prolong service life, even when non-pipeline gases, such as landfill gas, are used.



Jenbacher Type 4

Based on the proven design concepts of Jenbacher Type 3 and Type 6 gas engines, the modern Type 4 gas engine in the 800 to 1,500 kW power range is characterized by high power density and outstanding efficiency. The engine's enhanced control and monitoring provide easy preventive maintenance, as well as excellent reliability and availability.

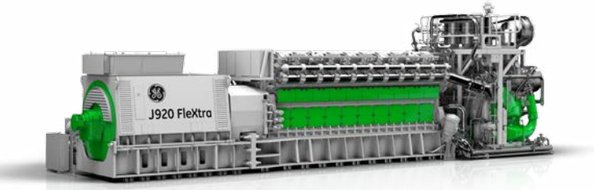


Jenbacher Type 6

The result of continuous enhancements and extensive experience, the Type 6 gas engine is an advanced and reliable addition to the Jenbacher gas engines product line in the 1.8 to 4.5 MW power range. The 1,500-rpm engine speed results in a high-power density with low installation costs, and its pre-combustion chamber achieves high efficiency with low emissions. Proven design and enhanced components support a service life of 60,000 operating hours before the first major overhaul. The J624 model features advanced 2-stage turbocharging technology, which offers high electrical efficiency combined with improved flexibility over a wide range of ambient conditions.

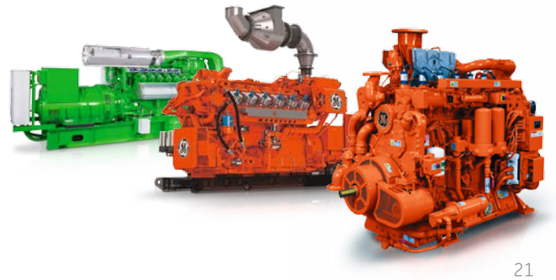
Jenbacher Type 9

Whether you're seeking full power at overall efficiency levels between 90 and 95% or a unit capable of startup in less than three minutes, GE´s Jenbacher J920 FleXtra gas engine is a reliable 10 MW solution for power generation plants. This Jenbacher gas engine is designed to support a broad variety of multiple-engine power plant solutions – from remote power supply to Combined Heat and Power (CHP) generation. A J920 FleXtra gas engine operating at 49.9% electrical efficiency can produce approximately 68 million kWh of electricity. Plus, GE also offers the pre-fabricated, compact and optimized J920 FleXtra Power Pack, which covers most of the total plant installed equipment. That includes all critical elements for high performance, high reliability, shortened delivery and installation as well as easier plant maintenance.



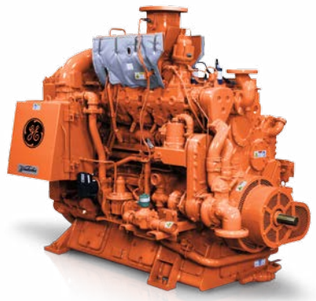
mobileFLEX

The mobileFLEX portfolio is the latest advancement from GE to deliver lower-cost, lower-emission power to drill rigs, artificial lift enhanced oil recovery, and oilfield equipment. An all-gas alternative to diesel units, this EPA mobile-certified solution uses field gases – an operational advantage to drilling contractors and a cost advantage to energy producers. The mobileFLEX portfolio is comprised of a Jenbacher J320, a Waukesha VGF and a Waukesha VHP gas engine.



GE’s Distributed Power product portfolio

Waukesha VGF

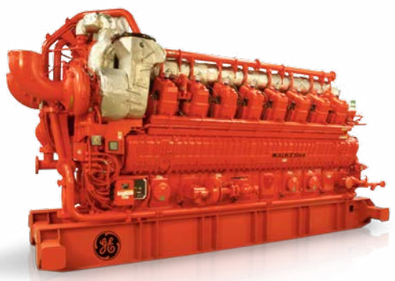


For three decades now, Waukesha’s VGF line of gas engines has consistently performed under extreme conditions in a wide range of power generation, gas compression, and mechanical drive applications. The VGF series is built to deliver continuous output, with industrial strength to handle continuous high rpm up to 1,175 HP (876 kWb).

Waukesha VHP

Providing reliable power for continuous and intermittent power applications, GE’s Waukesha VHP generator sets are built for efficiency, durability and longevity. Ranging from 550 to 1,600 kW (460-840 bhp), the VHP is the oldest active member of the Waukesha gas engine fleet. Introduced in 1967, this workhorse is still performing wherever it’s needed a half-century later. VHP generator sets power the world’s energy structure, and can be found in every corner of the globe.

Waukesha 275GL+



GE’s Waukesha 275GL+ gas engine represents an advanced generation of high-horsepower engines in the gas compression segment. A combination of robust construction and innovative technology, the 275GL+ lean-burn engine delivers fuel flexibility, efficiency, and outstanding emissions. Providing excellent uptime and profitability, the 275GL+ gas engine offers power output between 2.5 and 3.5 MW (3,750-5,000 bhp).

Always ready

Our global support network is available for you, when you need it, for the lifetime of your equipment

The Distributed Power global service network provides life cycle support for more than 35,000 reciprocating engines worldwide to help you meet your business challenges and success metrics – anywhere and anytime. Backed by GE service technicians and Channel Partners in more than 100 countries, our service network connects with you locally for rapid response to your needs. And, with our Asset Performance Management solution, you often can avoid a service call altogether – so you're up and running faster than ever before.

Always adding value … throughout your equipment's life cycle

As the original equipment manufacturer (OEM), it's crystal clear that we know your engines best. Combining digital know-how, innovative technology, service and support, we bring proven outcomes across the life cycle of your engines. That means less unplanned downtime, greater workforce efficiency and lower operating costs. From commission and installation to conversions and upgrades, our global network of qualified experts provides the support you need, when you need it.

Digital.

With the Digital Thread flowing through everything we do, we're constantly innovating, always improving, and proactively meeting your needs. That's right: Our use of big data can help keep your gas engines running better than ever before.

CM&Us.

At GE, we are always working to improve our technologies so your equipment keeps increasing in value throughout its operating life. By leveraging the latest technology and engineering expertise, our conversions, modifications and upgrades (CM&Us) help you keep pace with changing industry conditions, needs and challenges.

Parts.

We will quickly answer your call should you need a field service technician. And, with our advanced engineering techniques and high-quality materials, our parts will help you get the most out of your gas engines while protecting your investment. Every part is thoroughly tested, and backed by our OEM warranty. In addition, our reUp remanufactured parts are designed to work seamlessly with your new engine parts, and are backed by the same robust warranty.

Multi-year agreements.

Your next service event is already being planned. GE's multi-year agreements (MYAs) provide the best option for preventative and cost-effective maintenance for your technology, providing faster parts delivery, less life cycle capital expenditure, and more predictable exchange/overhaul solutions.

Overhaul program.

This economic replacement solution can save you time, and reduce your downtime. And, combine an overhaul with one of our upgrade products to receive the latest available technology.

4.7M

spare parts shipped in 2016

Service in more than

100

countries

More than

61

Channel Partners

Always digital, to keep you on top

You can see GE's embrace of digitalization at our own manufacturing plants, where we are continuously refining our operations, accelerating innovation and improving our customers' experience. The Brilliant Factories we are developing around the world, including our showcase in Jenbach, Austria, and a new facility under construction in Welland, Canada, combine optimal lean manufacturing and productivity with additive manufacturing and advanced software analytics. Digital enablement starts with our engineers and runs through our manufacturing sites – all the way to our installed base and back again. We can even create dynamic models called Digital Twins to help improve quality, performance and productivity.

GE's myPlant Asset Performance Management increases the availability, reliability and operating performance of your Waukesha and Jenbacher gas engines.

With myPlant, powered by Predix, a local monitoring and diagnostics infrastructure, you can remotely calculate plant performance every day of operation, giving you real-time intelligence for better decision-making.

Globally, more than 10,000 assets are increasing their uptime and gaining innovative solutions as they take advantage of GE's luminous digital capabilities.

More than
10,000
assets under management

More than
35,000
gas engines installed

More than ***800,000*** managed sensors

More than
6.5 TB
generated data per year

Fleet upgrade - more horsepower, lower emissions and big savings

Challenge

Headquartered in Houston, TX, Archrock is a leading provider of natural gas compression services to US oil and natural gas customers. The company acquired a group of high-hour Waukesha gas engines that it wanted to upgrade for use anywhere, no matter how strict the emissions regulation.

Solution

Archrock chose to invest in GE's Series 2 to Series 4 Model Conversions Program, which bundles a combustion, emissions and horsepower uprate into a single package. By converting engines from lean-burn combustion, with its excess air-to-fuel ratio, to rich-burn, GE can increase engine reliability, availability and horsepower while lowering emissions – all at a cost of less than 70% of the price of a new engine.

Results

With this upgrade, Archrock has saved $150,000 per engine! Already adding 20,000 horsepower to its fleet, with more to come as the upgrade continues, Archrock is leading the industry in a revitalization campaign, taking what is basically a stranded asset and converting it to an engine package that is almost like new.

Digital technologies help ripen Dutch tomatoes

Challenge

Over 40 high-tech greenhouse facilities owned by the 27-member Prominent Growers Association are meeting their onsite power, heating, CO_2 and artificial lighting needs with Combined Heat and Power (CHP). Most of the more than 150 MW produced is supplied by 50 of GE's Jenbacher gas engines. Optimizing the engines' reliability is paramount in helping Prominent meet or exceed crop production targets while improving its members' ability to serve their customers.

Solution

GE's myPlant Asset Performance Management (APM) software was installed to monitor the Jenbacher gas engines and detect potential issues – many of which can be resolved remotely. The software is powered by Predix, GE's cloud-based Industrial Internet platform, and monitored at GE's Quick Response Center in the Netherlands.

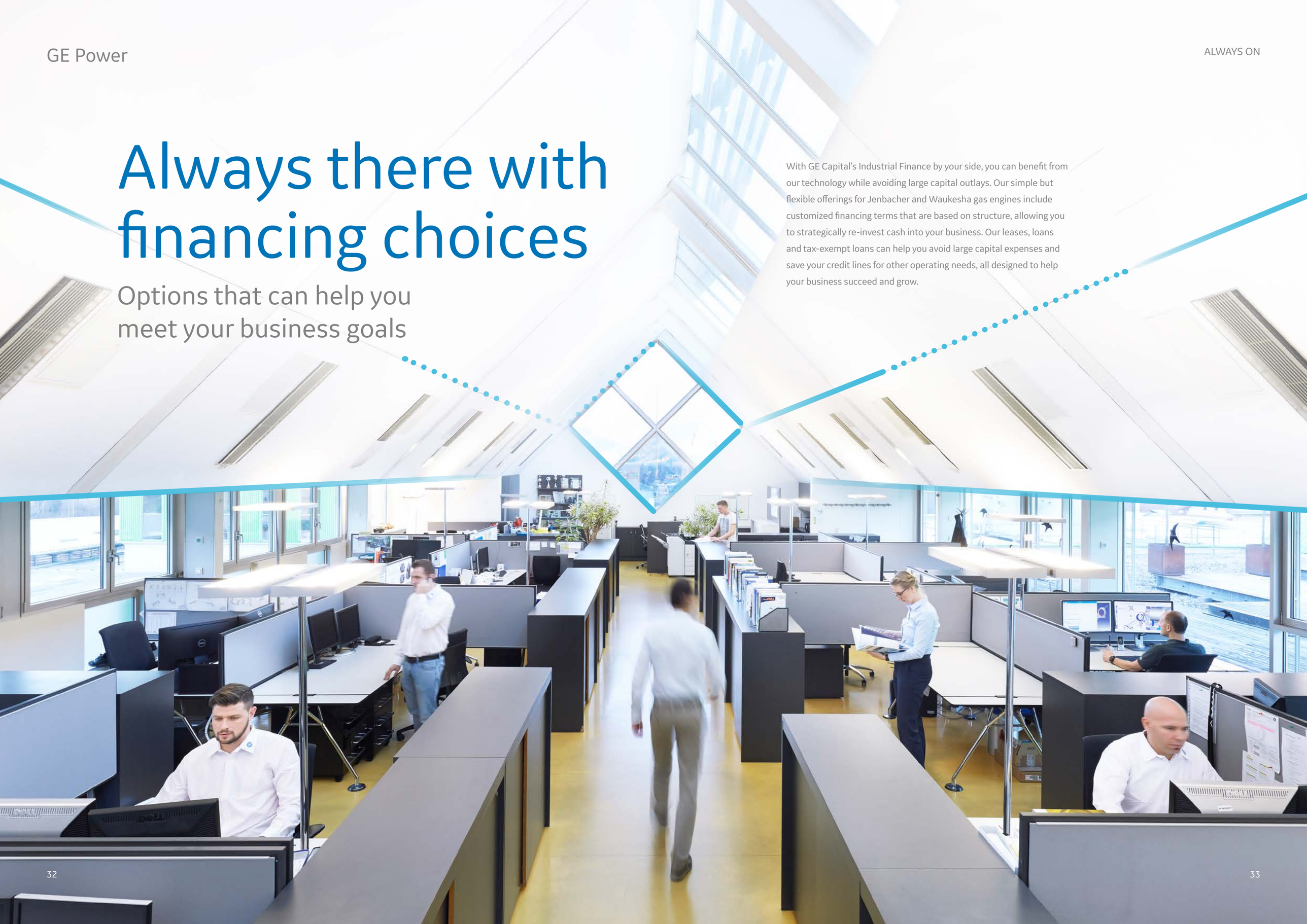
Results

GE's latest digital technologies are helping Prominent's members rise to new levels of reliability, availability and operating performance, giving them greater real-time visibility of the condition of their fleet and even helping them manage peaking power generation when the feed-in tariff is high.

Always there with financing choices

Options that can help you meet your business goals

With GE Capital's Industrial Finance by your side, you can benefit from our technology while avoiding large capital outlays. Our simple but flexible offerings for Jenbacher and Waukesha gas engines include customized financing terms that are based on structure, allowing you to strategically re-invest cash into your business. Our leases, loans and tax-exempt loans can help you avoid large capital expenses and save your credit lines for other operating needs, all designed to help your business succeed and grow.



www.gepower.com/distributedpower

GE's Distributed Power business is a leading provider of engines, power equipment and services focused on power generation and gas compression at or near the point of use. Distributed Power offers a diverse product portfolio that includes highly efficient, fuel-flexible, industrial gas engines generating 100 kW to 10 MW of power for numerous industries globally. In addition, the business provides life cycle support for more than 35,000 gas engines worldwide to help you meet your business challenges and success metrics – anywhere and anytime. Backed by our service providers in more than 100 countries, GE's global service network connects with you locally for rapid response to your service needs.

GE's Distributed Power business is headquartered in Jenbach, Austria.

More information on GE's Distributed Power technology

Austria
Achenseestraße 1-3
6200 Jenbach, Austria

China
No.1 Hua Tuo Rd.
Zhang Jiang Hi-Tech Park
Shanghai 201203, China

Denmark
Samsøvej 10
8382 Hinnerup, Denmark

Germany
Carl-Benz-Str. 25
67227 Frankenthal, Germany

Italy
Via Staffali 1
37062 Dossobuono, Italy

Kenya
The Courtyard
General Mathenge
Drive Westlands
Nairobi, Kenya

Lebanon
Berytus park.
Park Avenue, Block B, second floor
Beirut, Lebanon

Mexico
Antonio Dovali Jaime 70
Piso 4, Torre B
Ciudad de Mexico
CP 01210, Mexico

Russia
Presnenskaya Naberezhnaya 10A
1233112 Moscow, Russia

Singapore
Level 9, The Metropolis Tower 2
11 North Buona Vista Drive
Singapore 138589

Spain
Calle Josefa Valcarcel 26
Building Merrimack III
28027 Madrid, Spain

Edif. Meridian, planta 10
C/ Rosselló i Porcel 21,
08016 Barcelona, Spain

The Netherlands
Kelvinring 58
2952 BG Alblasserdam, The Netherlands

USA
Westway Plaza,
11330 Clay Road
Houston, TX 77041, USA

1101 West St. Paul Avenue
Waukesha, WI 53188-4999, USA

Imagination at work

GEA33325