



GENSETS

MUCH MORE
THAN YOU EXPECT

Power Generation

TAKING PARTNERSHIP TO NEW LEVELS:
COMPLETE POWER SYSTEM SOLUTIONS



A Rolls-Royce
solution



POWER GENERATION TABLE OF CONTENTS

01 Pioneering the power that matters	05
World-class power solutions and complete life-cycle support	
02 Power solutions from a single source	06
03 Standby power solutions	12
References: Telecommunication/Hospital	14
References: Airport/Data center	16
04 Continuous power solutions	20
References: Industry/Farming	22
References: Biogas	24
05 Product overview	
Diesel and gas gensets	28
06 Service solutions	
Local support, worldwide	34

FROM PLANNING & DEVELOPMENT

TO INSTALLATION & MAINTENANCE

PIONEERING THE POWER THAT MATTERS.

01

Rolls-Royce provides world-class power solutions and complete life-cycle support under our product and solution brand MTU. Through digitalization and electrification, we strive to develop drive and power generation solutions that are even cleaner and smarter and thus provide answers to the challenges posed by the rapidly growing societal demands for energy and mobility. We deliver and service comprehensive, powerful and reliable systems, based on both gas and diesel engines, as well as electrified hybrid systems. These clean and technologically-advanced solutions serve our customers in the marine and infrastructure sectors worldwide.

A solution provider

MTU systems power the largest yachts, the strongest tugboats and the biggest land vehicles and provide energy for the world's most important mission-critical applications. Through advanced solutions such as microgrids, we integrate renewable energies and manage the power needs of our customers.

Our customized service offerings help you maximize uptime and performance and are supported by our digital solutions, which enable remote monitoring, predictive maintenance and a range of other benefits that keep your systems running at their best.

For over 110 years, we have provided innovative power solutions for our customers – meeting even the most demanding drive requirements. Our products and services span a wide range of applications and power needs, with both standard and customized options.

An expert in technology

As part of Rolls-Royce, we have long been known for cutting-edge innovation and technological leadership in product development. That same spirit of innovation inspires our sustainability efforts. Our focus is on developing and implementing system solutions that both maximize efficiency and reduce emissions -- which in turn work to reduce our impact on the environment.

A passionate and reliable partner

We at Rolls-Royce spend every day working together with our customers, to deliver engines, systems and complete life-cycle solutions that best fit your needs. We understand that each application is different and has its own specific demands. Our engineers embrace the challenge of finding the perfect solution for your unique power requirements. Every step of the way – from project planning, through design, delivery and commissioning; to the lifetime care of your equipment – we are dedicated to helping you get the most from your MTU investment.

MORE THAN POWER

02

We offer all the expertise, equipment and services needed to integrate complete power solutions – from fuel supply to electrical design. Our customer-tailored generator sets come with convenient single-source service arrangements. We also offer long-term solutions that cover the entire service life of your system.

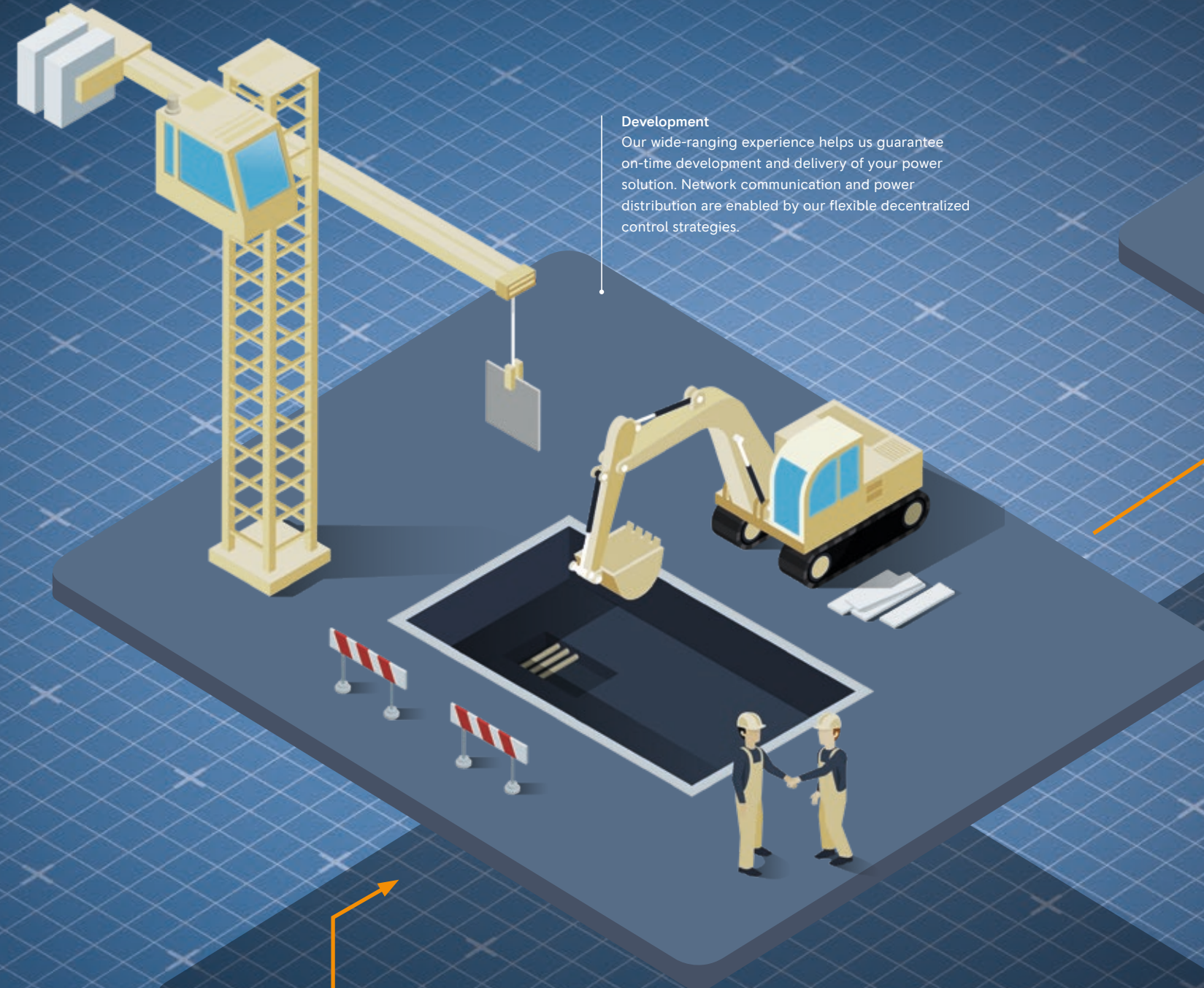
Planning

We rigorously analyze the demands of your business and staff, as well as the applicable standards, guidelines, deadlines, and local conditions. That allows us to design the optimal solution and prevent future problems.



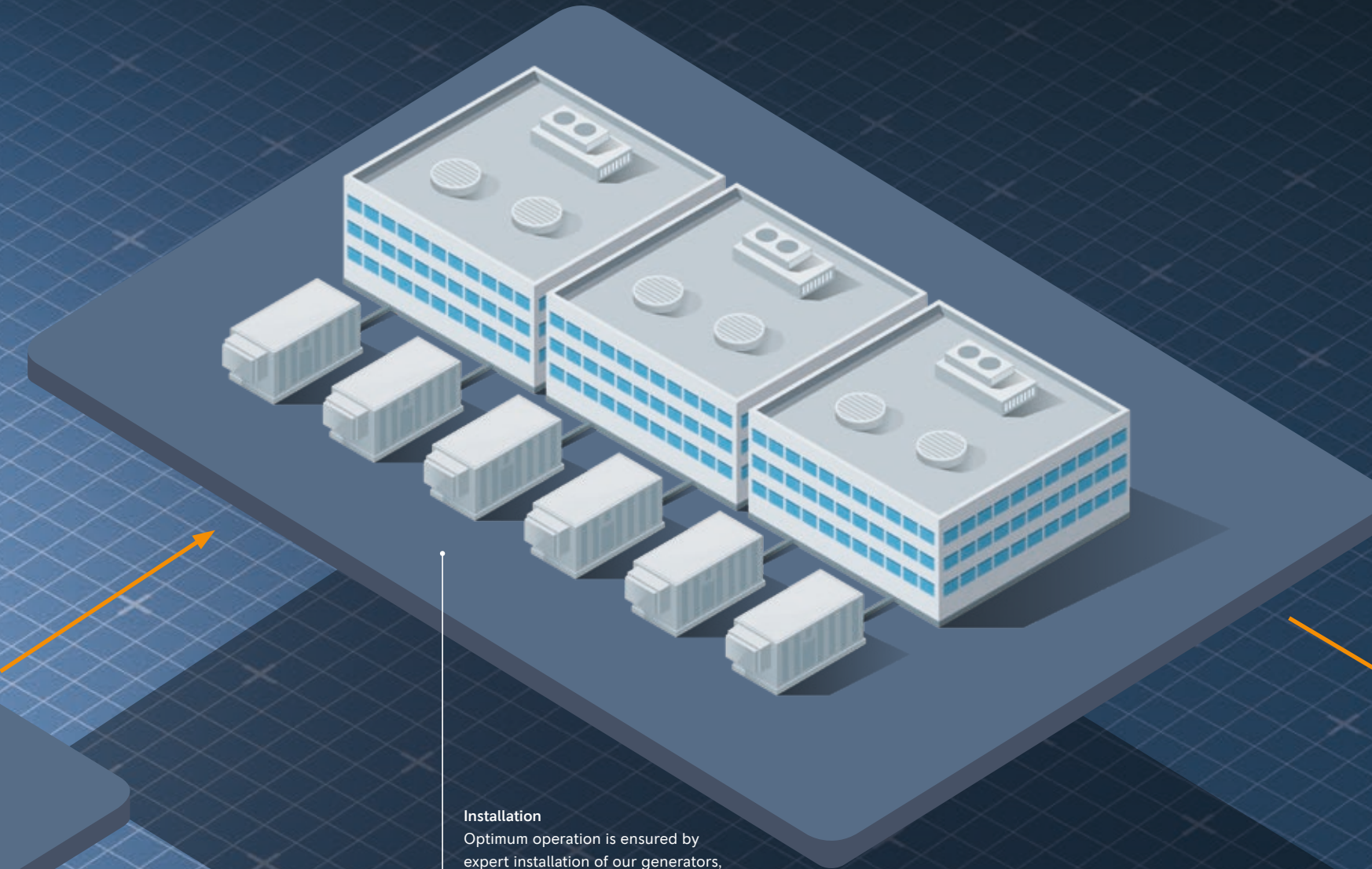
Development

Our wide-ranging experience helps us guarantee on-time development and delivery of your power solution. Network communication and power distribution are enabled by our flexible decentralized control strategies.



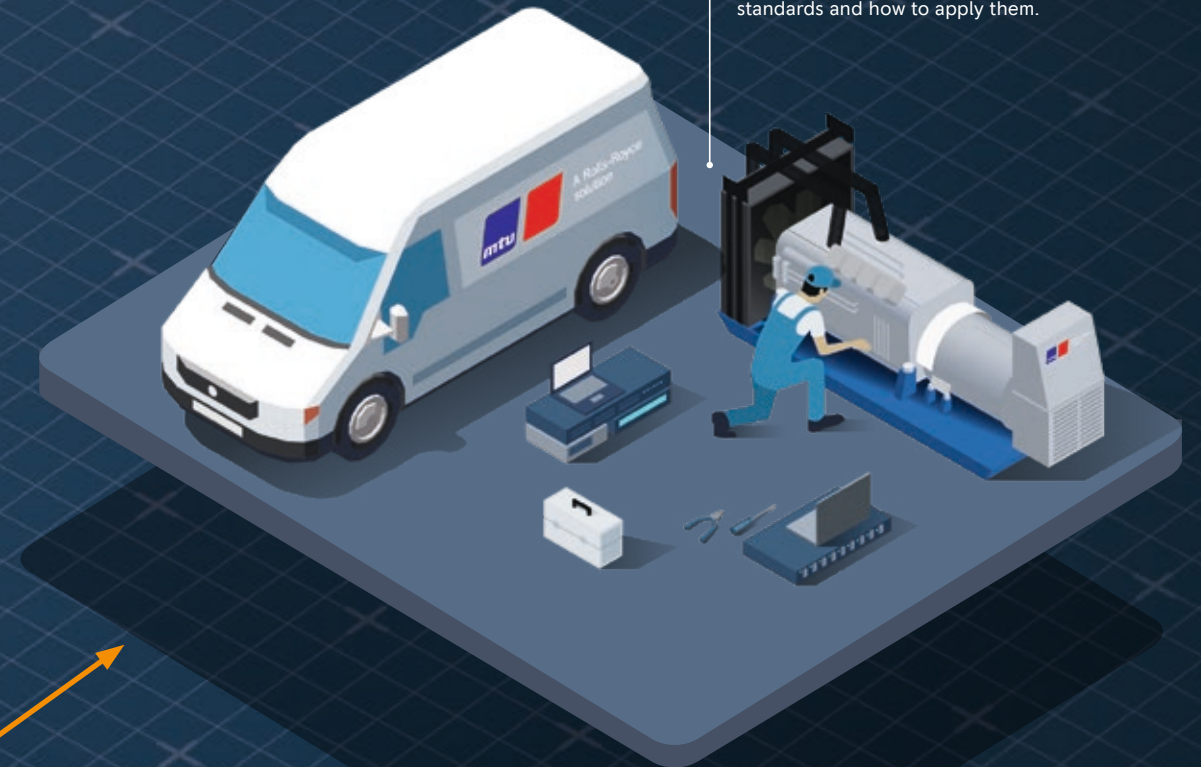
Installation

Optimum operation is ensured by expert installation of our generators, including integration with the local power grid and control network, software implementation, emergency simulation, test runs and training.



Maintenance

System monitoring and comprehensive on-site service for all components is available around the clock and conducted by experienced technicians with expert knowledge of regional standards and how to apply them.





STANDBY POWER
SOLUTIONS

EVERYTHING UNDER
CONTROL

STANDBY POWER SOLUTIONS

03

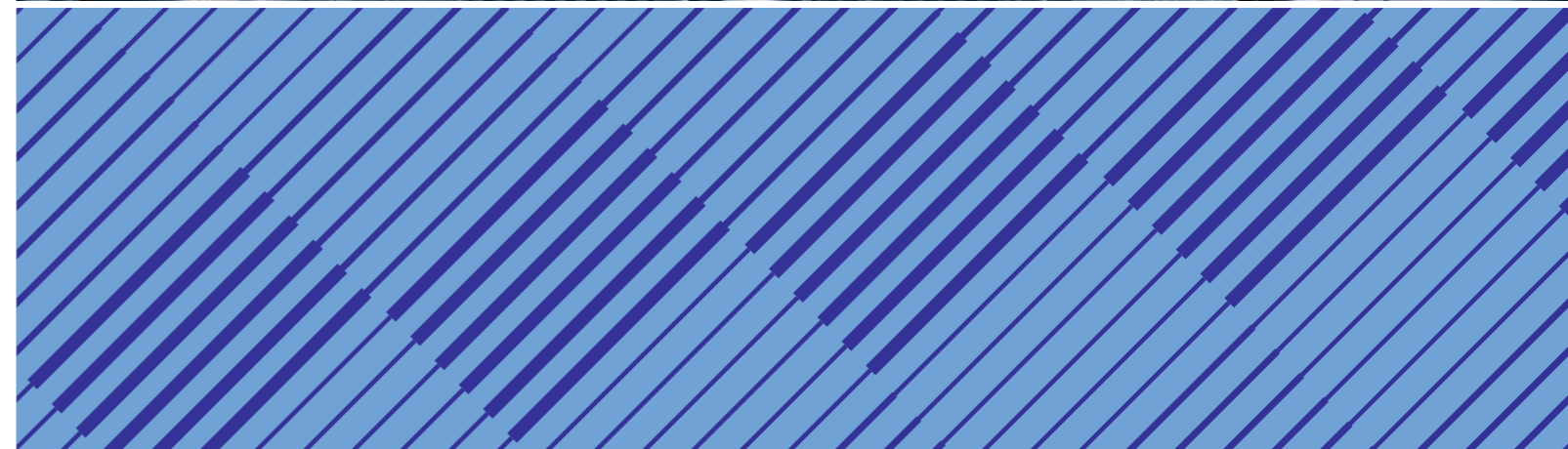
Standardized backup

MTU diesel generator sets function as safeguards to ensure uninterrupted electricity supplies to residential and public buildings, industrial facilities or entire city districts. Standardized backup provides reliability when grid power fails. Whether a drop in voltage or a blackout, it's vital to have reliable standby diesel systems that ramp up within seconds to restore electricity independently of the grid. MTU gensets are engineered for maximum reliability, high load capability and quick response in order to safeguard operations at low investment cost.

We provide reliable natural gas and liquid-propane-fueled gensets for standby power applications. Backed by decades of experience and total system expertise, MTU gas gensets are effective, dependable and configured to meet your exact requirements.

Mission critical

Mission critical standby power is essential when lives or huge economic losses are at risk. That makes it a must in hospitals, health care facilities, governmental and public buildings and for infrastructure systems. Data centers, of course, provide indispensable services for all of the institutions above. We focus on the highest reliability and availability of power.



STANDARDIZED BACKUP

Telecommunication

Never “temporarily not available”

In the hotly contested Turkish telecommunications market, Türk Telekom cannot afford to interrupt service for its customers. Its central facility channels 33% of Turkey’s internet volume. That’s why, in 2011, Türk Telekom chose MTU to make sure it is well prepared to meet future demand.

We used our experience as a systems provider to completely equip the facility, supplying everything from generator sets through switch cabinets to electrical plant. The systems run in parallel and each can serve as a backup for the other. Their high torque gives the MTU engines rapid ramp-up and high load capabilities, enabling them to reach full operating output, with stable voltage and frequency, within just nine seconds, keeping the data flowing.

Who:

Telecommunications company Türk Telekom

What:

Emergency power supply based on 16-cylinder Series 4000 diesel gensets (MTU 16V4000 DS) for the Istanbul center of telecommunications provider Türk Telekom

Where:

Istanbul, Turkey



MISSION CRITICAL

Hospital

Ready to save lives without interruption

The Charité University Hospital treats about half a million patients a year and is Berlin’s third largest electricity consumer. We supplied the hospital with a turnkey system including two diesel gensets, cooling, fuel and exhaust systems, air supply and extraction system and control system.

We were responsible for planning the project including construction and control systems and incorporating strict noise abatement regulations and exhaust emission limits. The backup systems now ensure the electricity supply for the main diagnostic suite and the nuclear medicine, dermatology, psychiatry, neurology and pathological diagnostics departments. Emergency startup only requires one starter system, the other acts as redundant backup for additional safety.

Who:

Charité University Hospital

What:

Emergency power supply for the north section of the hospital site Campus Charité Mitte provided by two diesel gensets (MTU 12V4000 DS) including peripherals

Where:

Berlin, Germany





MISSION CRITICAL

Airport **Standby for Takeoff**

A major ice storm left Tulsa airport without power for more than eight hours and stranded thousands of passengers. We were chosen to supply a new standby power system incorporating two gensets with a unique, low-cost generator paralleling solution.

The generators are able to synchronize without expensive paralleling switchgear using their standard DGC2020 onboard generator controllers. This has raised flexibility and created opportunities to reduce energy consumption, lower operating costs and reduce the use of natural resources. The innovative design helped keep project costs low without affecting system reliability or efficiency.

Who:
Tulsa International Airport

What:
MTU system backs up 4 MW load with two generator sets paralleled without traditional switchgear

Where:
Tulsa, Oklahoma, USA



Data center **Ensuring 100% uptime**

Industry leader Infomart set high standards for its new Portland data center power system: low fuel consumption, low subtransient reactance, 85 percent load factor, and flexibility for future growth.

The MTU Series 4000 generator sets used are designed for optimal fuel consumption, exceptional reliability and high-power density. The data center is Uptime Tier 3 compliant and provides 99 percent efficiency of uninterrupted power supply. It is expected to save over 48 million kilowatt hours and reduce carbon emission by 43 million pounds over the next decade by sourcing hydroelectricity from the federal Bonneville Power Administration (BPA).

Who:
Infomart Data Centers

What:
Fourteen 2,000 and 2,250 kW MTU Series 4000 DS diesel generator sets with customized enclosures

Where:
Hillsboro, Oregon, USA

CONTINUOUS POWER SOLUTIONS

24/7 IN MOTION

CONTINUOUS POWER SOLUTIONS

04

Continuous + CHP

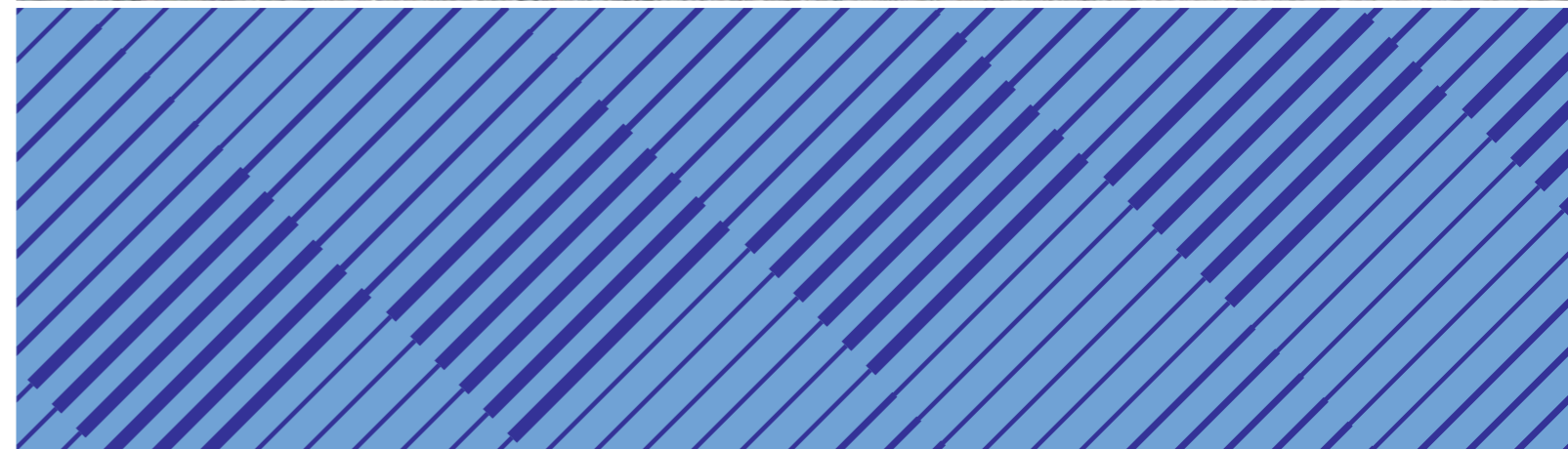
Continuous power gensets are designed for long term use with constant or varying loads. They are primarily used for the base load generation of electricity, in remote locations with limited access to the public grid. They can operate as island, island-parallel or grid-parallel applications. They can also be used for combined heat and power (CHP) generation.

Prime

Prime power applies to installations where utility power is unavailable or unreliable. At varying load, the number of genset operating hours is unlimited.

Peak

Peak power is focused on providing additional short-term power to the grid (peak shaving). This application becomes relevant whenever renewable power sources like solar or wind are used that might not always be able to provide the full power demand, for example during peak load times.





CONTINUOUS + CHP

Industry

Turning heat into ice cream

Langnese makes millions of liters of ice cream for the whole of Europe at its Heppenheim plant, and – perhaps surprisingly – heat plays a major part in this. The company has been using an MTU heat-controlled combined heat and power (CHP) plant since 2009 to meet part of this demand for both heat and electricity.

The site requirements are complex, but the MTU 16-cylinder Series 4000 natural gas engine achieves an efficiency factor of 87.1% by optimizing the utilization of heat. The combined heat and power plant allows Langnese to adapt heat generation flexibly to satisfy peak production demands in its factory.

Who:

Ice cream manufacturer Langnese

What:

Heat-controlled cogeneration plant featuring an MTU 16V4000 GS gas system

Where:

Heppenheim, Germany



Farming

Turning waste into energy

The Norm-E-Lane dairy farm has almost 5,000 head of cattle, which produce a lot of manure. But it isn't wasted. The farmers use an anaerobic digester to generate methane biogas from the cow manure. The biogas is then used to generate electricity and heat with a Series 4000 MTU biogas combined heat and power (CHP) system.

The new CHP system went into service in 2015, and the high-efficiency upgrade is already generating additional savings. The farm doesn't use any of the electrical output. Instead, all the "cow power" is sold to the grid. However, the heat generated is used to heat the anaerobic digester, helping boost sustainability and improve the bottom line.

Who:

Norm-E-Lane Farm

What:

MTU 8V4000 GS Biogas CHP system

Where:

Chili, Wisconsin, USA

CONTINUOUS + CHP

Biogas

Saving money and the environment

General Starch Limited (GSL) is one of Thailand's biggest producers of starch, which it extracts from the roots of the cassava plant. In 2016 it installed two combined heat and power (CHP) gensets to power the energy-intensive production process.

The two MTU units run on biogas generated by waste water from the production process. They also use the exhaust heat to run the absorption chiller that produces cold water used in the starch production process. This leads to a total energy efficiency of more than 80% and contributes to GSL's goal of reducing emissions.

Who:

General Starch Limited (GSL)

What:

MTU 20V4000 GS Biogas CHP system

Where:

Khon Buri, Nakhon Ratchasima Province (Thai: Korat Province), North Eastern Thailand



Biogas

From pig farmer to energy producer

Pietro Bertesago rears pigs for the production of Parma ham. In 2008, he was the first farmer in the northern Italian province of Cremona to install a biogas plant and two years later, he introduced a second one. Both plants are based on combined heat and power (CHP) MTU modules.

Bertesago has developed the biogas plant as a second source of income because pig farming alone was no longer a high earner. He earns money by feeding the electricity into the public grid and in winter, he uses the heat from the engine to heat his pigsties.

Who:

Pietro Bertesago and Giovanni Bertoni

What:

MTU 12V400 GS Biogas CHP system

Where:

Moscuzzano and Sospiro, two villages in the northern Italian province of Cremona (near Parma, Italy)



A large industrial diesel engine is shown in a dark setting. The engine is a complex of metal parts, including a large intake manifold and various pipes. A vibrant, multi-colored light trail, consisting of overlapping red, blue, and purple streaks, curves around the engine, creating a sense of motion and energy. The text "DIESEL GENSETS OVERVIEW" is overlaid in white, sans-serif font on the left side of the image.

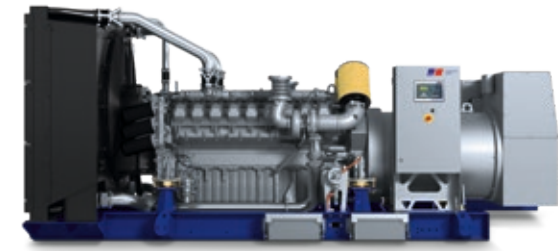
DIESEL GENSETS
OVERVIEW

A large industrial gas engine is shown in a dark setting. The engine is a complex of metal parts, including a large intake manifold and various pipes. A vibrant, multi-colored light trail, consisting of overlapping red, blue, and purple streaks, curves around the engine, creating a sense of motion and energy. The text "GAS GENSETS OVERVIEW" is overlaid in white, sans-serif font on the right side of the image.

GAS GENSETS
OVERVIEW

ALL DIESEL GENSETS AT A GLANCE.

05



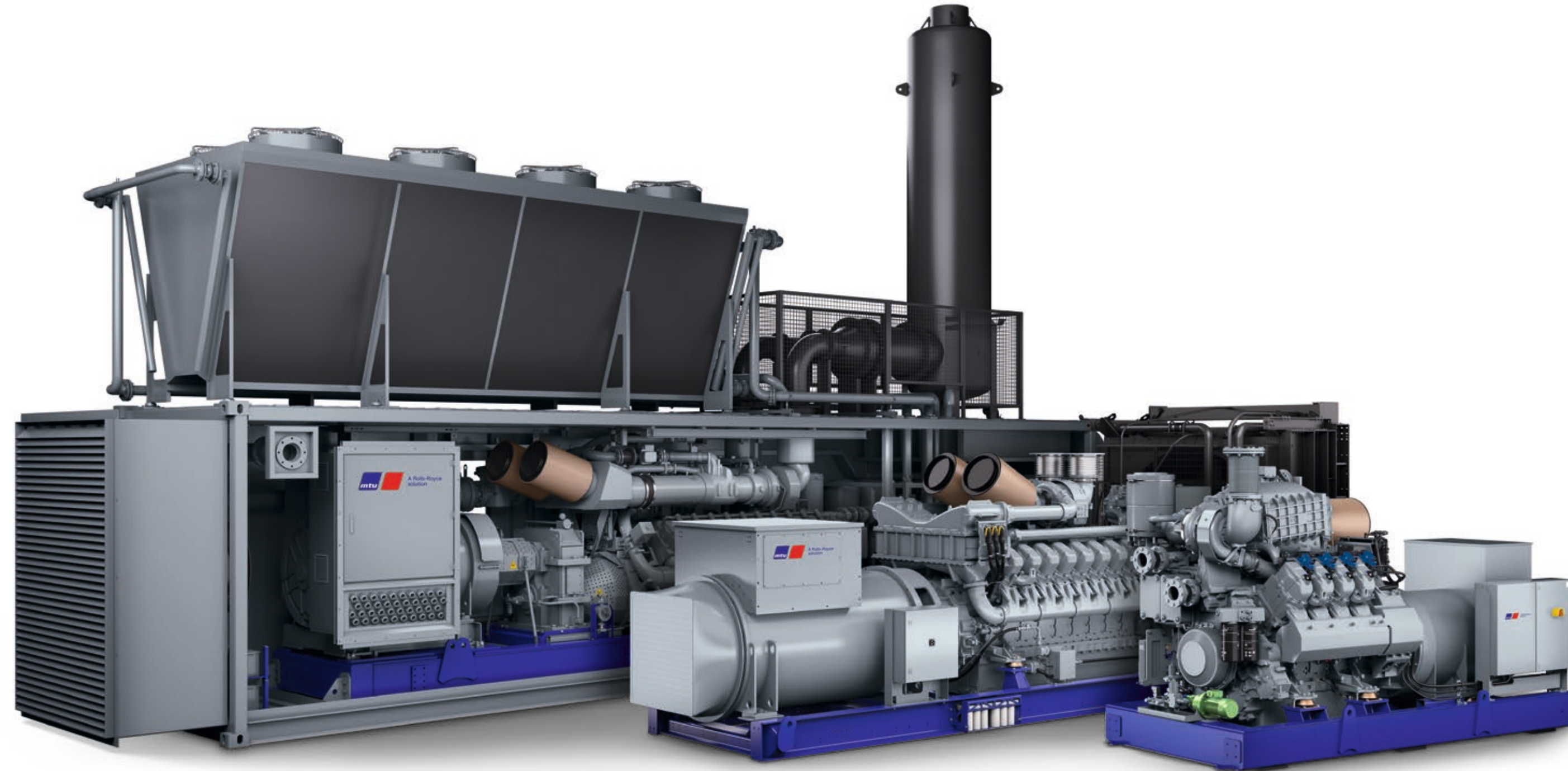
0080 - 1600 DS
50 Hz: 30 - 730 kVA
60 Hz: 27 - 600 kW

2000 DS
50 Hz: 750 - 1,400 kVA
60 Hz: 615 - 1,250 kW



4000 DS
50 Hz: 1,550 - 4,000 kVA
60 Hz: 1,125 - 3,250 kW

POWER MODULES
Diesel Power Containers 20' and 40'
For 50 Hz and 60 Hz

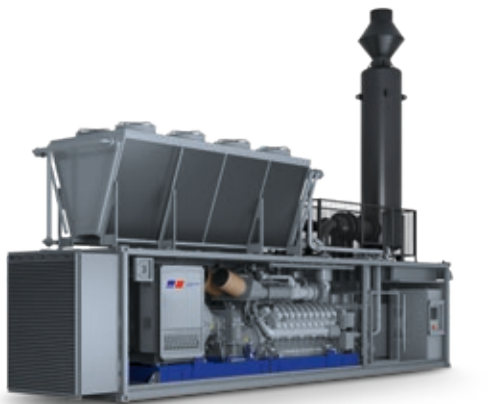
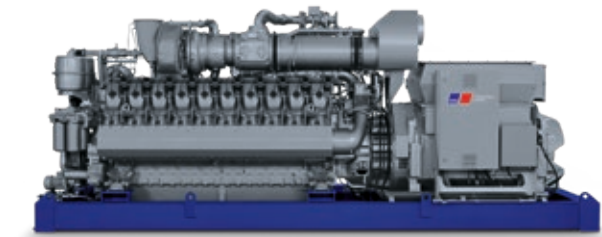


ALL GAS GENSETS AT A GLANCE.



0063-0185 GS
60Hz: 40 - 400 kW
Only for standby / prime applications

400 GS
50 Hz: 120 - 420 kW
60Hz: 130 - 360 kW
For natural, biogas and other gases



4000 GS
50Hz: 776 - 2,530 kW
60Hz: 760 - 2,130 kW
For natural, biogas and other gases

POWER MODULES
Gas power containers 40'
For 50 Hz and 60 Hz



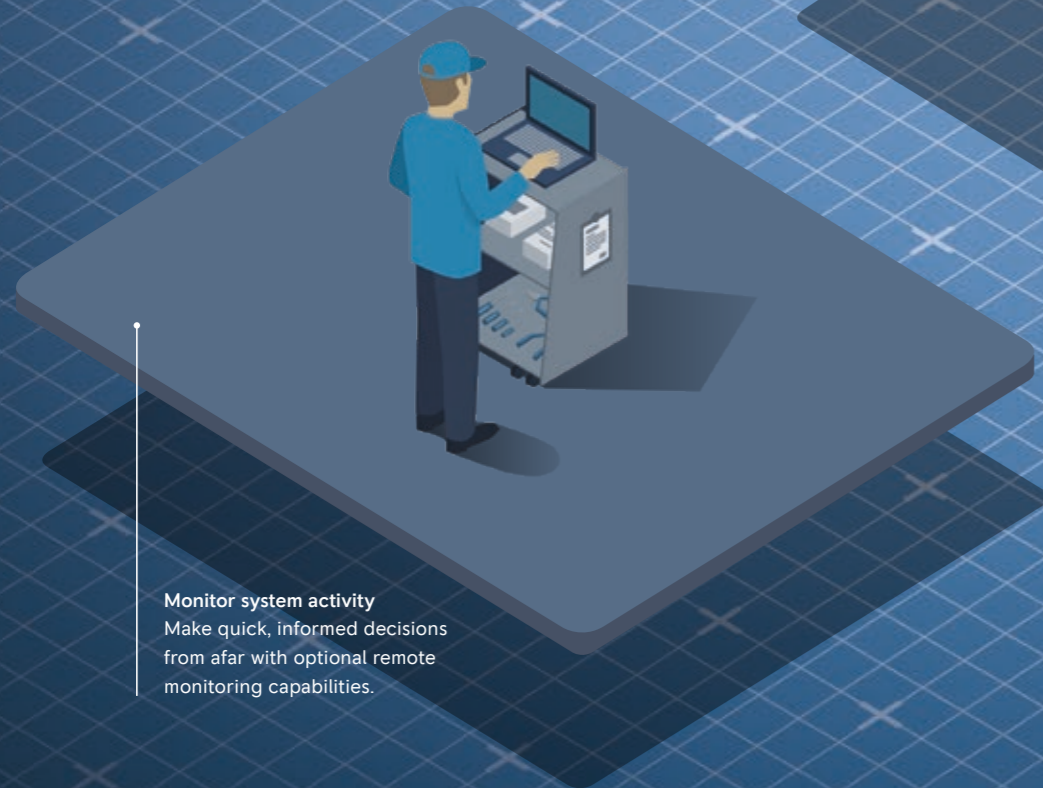
SERVICE
SOLUTIONS

PROTECTING YOUR
INVESTMENT

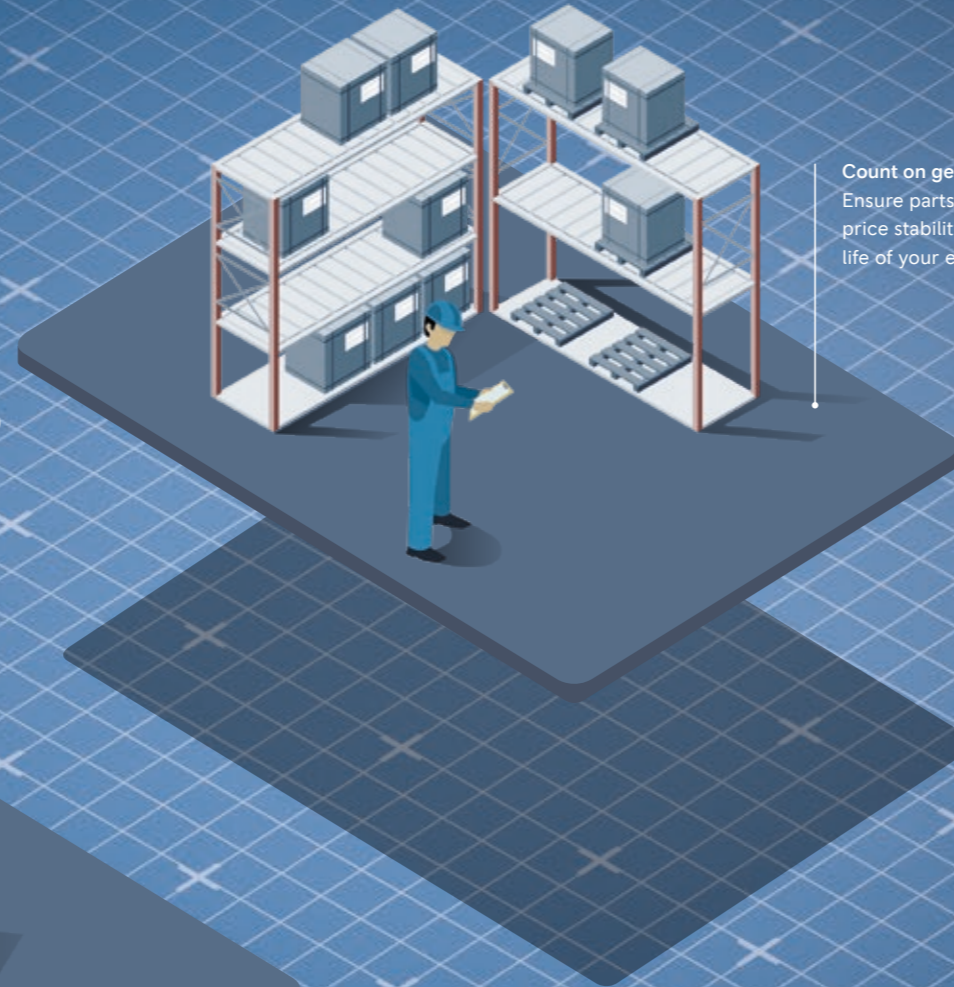
SERVICE SOLUTIONS DESIGNED AROUND YOUR BUSINESS.

06

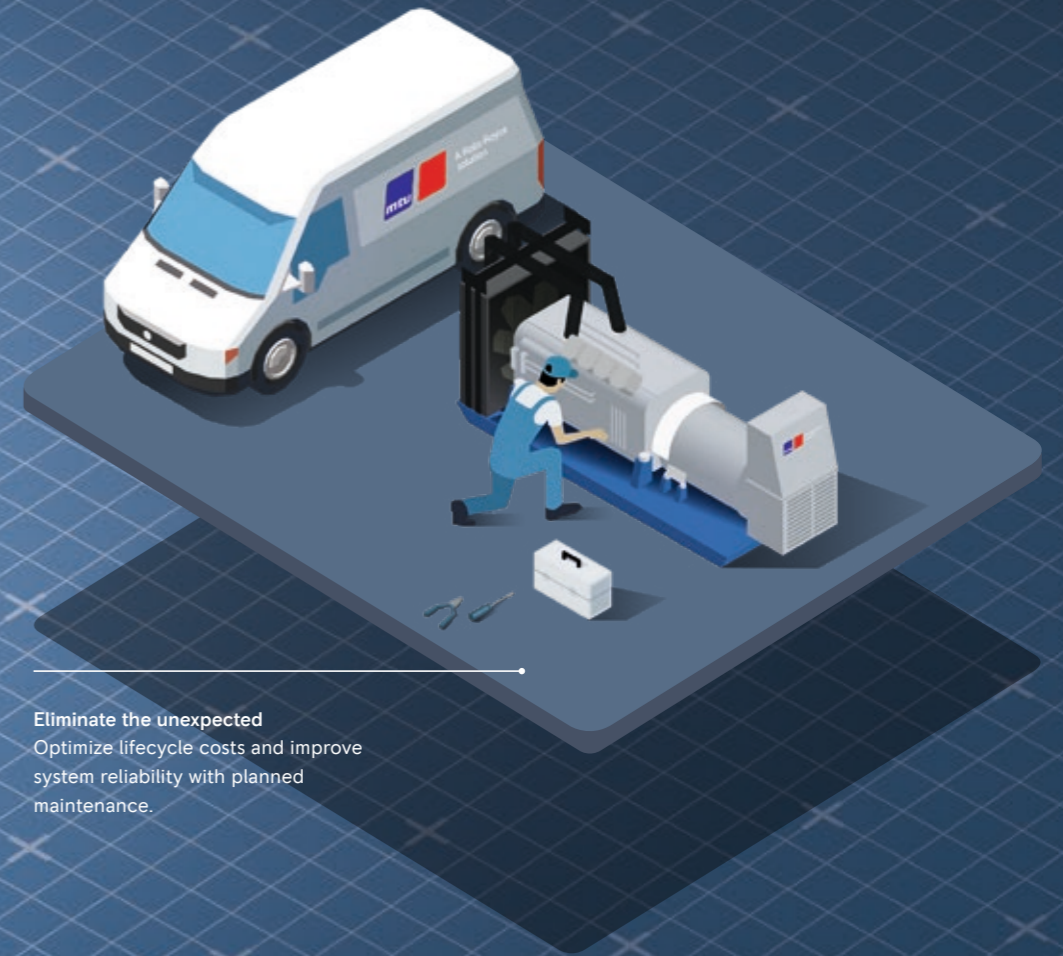
With us you get the power, performance and peace of mind to focus on what matters most—your business. Our digitally connected power systems, wrapped in MTU ValueCare Agreements, make it easy to keep your equipment operating reliably and reduce total cost of ownership (TCO) through proactive monitoring and preventive maintenance. So go ahead, focus on what matters most to you — and leave the rest to us. We are your partners in productivity.



Monitor system activity
Make quick, informed decisions from afar with optional remote monitoring capabilities.



Count on genuine parts
Ensure parts availability and price stability throughout the life of your equipment.



Eliminate the unexpected
Optimize lifecycle costs and improve system reliability with planned maintenance.



Local support, worldwide.
With more than 1,200 service locations worldwide, you can count on responsive support from expert technicians—wherever you are, whatever you need.

