

TRADITIONS AND INNOVATIONS BETTER ENERGY SOLUTIONS



Brno, Czech Republic

ABOUT COMPANY

RSE s.r.o. is an innovative company, a manufacturer of cogeneration modules in a container design based on gas engines MWM, which ensure continuous work in the production of heat and electricity.

Specialists of RSE s.r.o. for more than 15 years have been successfully engaged in the production, design and installation of modular cogeneration plants and other types of energy equipment.

THE PRODUCTION OF BOILER EQUIPMENT
CONTINUES HISTORY OF THE TRADEMARK



EFFICIENT ENERGY SYSTEMS

Production of Modular
Cogeneration Plants Based on
MWM Gas Engines



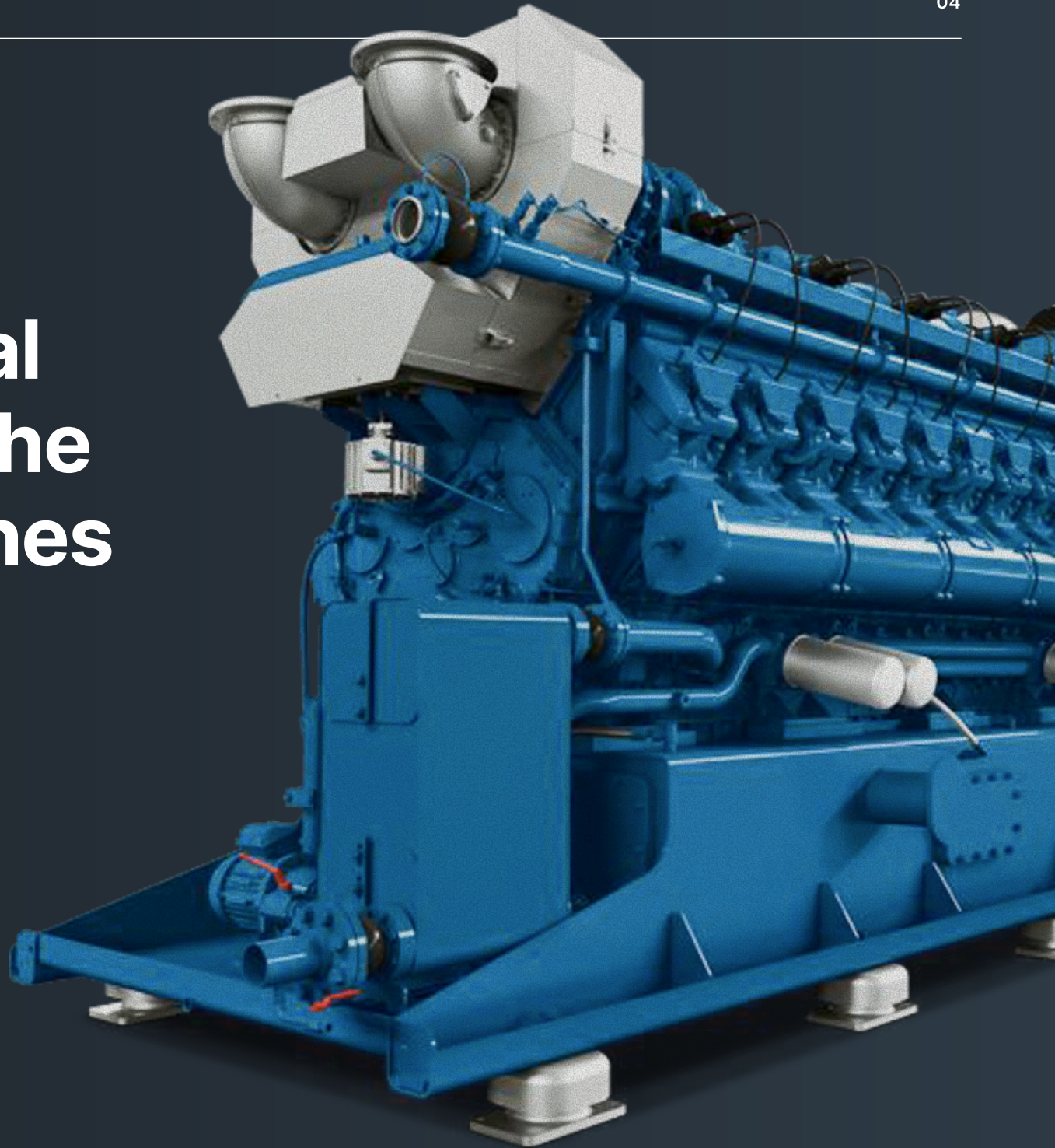
Production of Exhaust Heat
Exchangers to Increase the
Efficiency of CHP Units



Service and Maintenance of
Cogeneration Equipment



RSE is an Official
Key Partner of the
MWM gas engines
producer

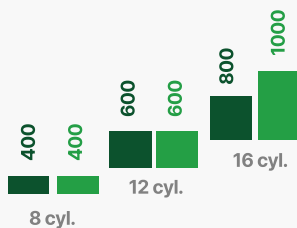
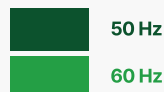


MWM GAS ENGINES AND GENSETS OUTPUT. RELIABILITY. ECONOMY.

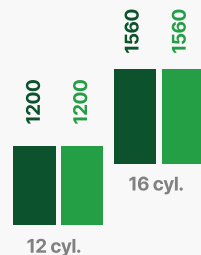
The MWM product portfolio comprises gas engines and gensets in the output range from **400 kWel to 10 000 kWel**. Power plants with an output of 100,000 kWel and more are technically feasible.

The gas engines can be operated with various types of gas, such as natural gas, shale gas, mine gas, biogas, landfill gas, sewage gas, syngas, flare gas and associated petroleum gas (APG).

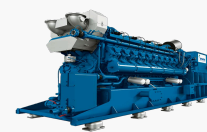
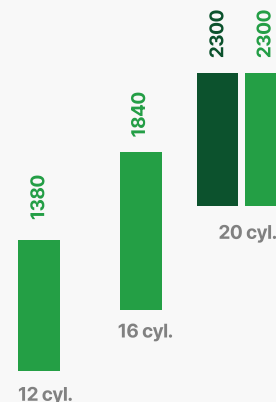
They are designed for maximum electrical and thermal efficiency, low operating and service costs, and high reliability and availability. Thus they achieve efficiency of over 90 percent.



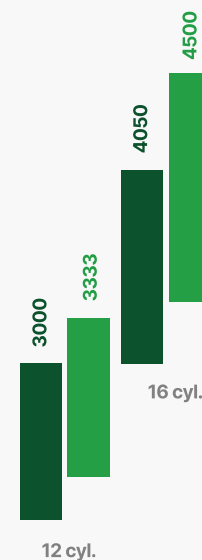
TCG 3016



TCG 2020



TCG 3020



TCG 2032

WHY ARE THEY GOOD?

Lower emission

Gas engines have lower emission rates and high efficiency in energy production. As emission regulations become stricter, gas operation has advantages such as low NOx / CO₂, and no SOx / Particle emissions.

Quick start time

Gas engines have a shorter start time compared with gas turbines. It takes 15 to 40 minutes for turbines to start, whereas gas engine only takes 2 to 7 minutes.

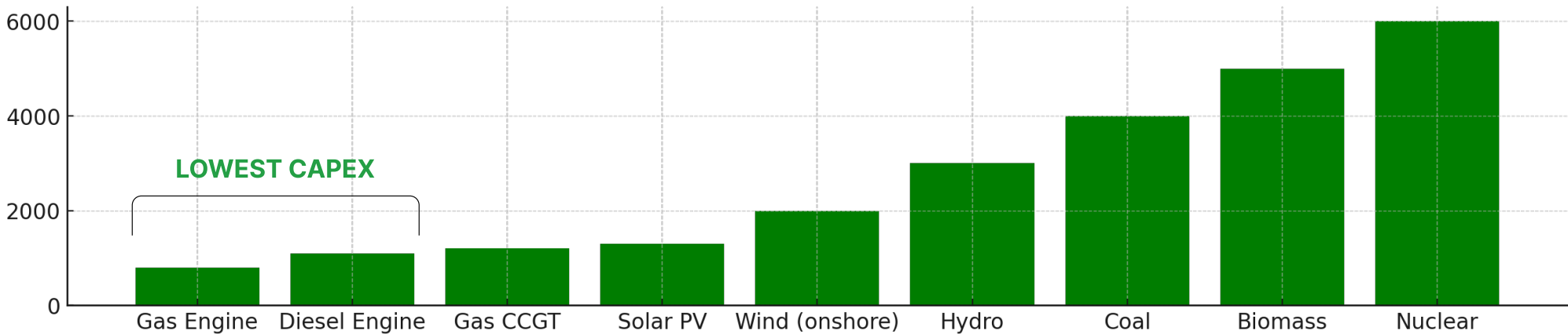
Stable power output

Gas engines are able to operate more stable than gas turbine under different ambient temperatures. While turbine power plant shows around 10% derating, gas engine power plant shows only 1% derating. Gas Turbine is also more sensitive at part load.

Economical

Gas engines are one of the most economical options in various power sources. Operation and maintenance costs are particularly low compared to other plants operating on other types of fuel.

The cost of electricity is lower than that received from the power grid.



TCG 3016 ENGINE: FROM 0.4 MW TO 1 MW

HIGHEST EFFICIENCY IN ITS POWER RANGE

- Electrical efficiency up to 43.6 percent
- Maximum profitability due to low operating costs
- Greater efficiency due to numerically optimized flow design with low losses

OPTIMIZED LUBRICANT MANAGEMENT

- The lowest lubricant consumption in its class: 0.1 g/kWh
- Longer oil change intervals
- Oil tank and integrated tank for daily replenishment

THE CONCEPT OF A FLANGED GENERATOR

- Anti-vibration main frame to reduce installation costs and reliable work
- Increased integrated lubricant volume
- Integrated oil managementses

IMPROVED TURBOCHARGER FOR WIDE APPLICATION

- Extended maintenance intervals
- Wider intake air temperature window with low losses

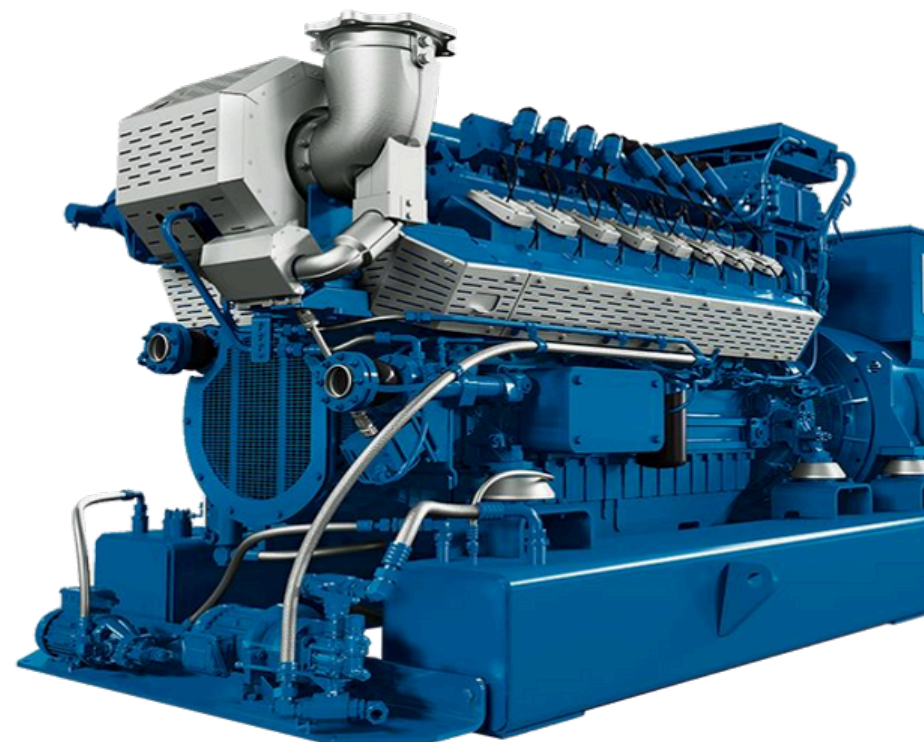
HIGHER AVAILABILITY, LONGER SERVICE LIFE

- Optimized combustion due to evenly charged cylinders
- Optimized combustion with lower peak pressure. The generator with a low vibration level

MAXIMUM RELIABILITY

- Very good island mode capability
- Corresponds to classes G1, G2 and G3 according to ISO 8528 with less than 10 steps in most applications

Engine type TCG 3016	V08p	V12p	V16p	V16S
E. power (kW)	400	600	800	1000
Average effective pressure (bar)	18.9	18.9	18.8	23.5
Thermal power, $\pm 8\%$ (kW)	404	617	819	1123
Electrical efficiency (%)	43.1	43.4	43.6	41.5
Thermal efficiency (%)	43.6	44.6	44.6	46.6
Overall efficiency (%)	86.7	88.0	88.2	88.1



TCG 2020 ENGINE: FROM 1 MW TO 1.56 MW

MORE PROFIT

The TCG 2020 is a highly efficient engine thanks to an optimized intake, combustion chamber and spark plugs. Save up to 15% per year on fuel costs - and increase the profitability of your station.

LOWER OVERALL COST

Thanks to the optimized components of the TCG 2020 engine, the need for oil is 50% less than in other similar generator sets. In terms of efficiency, this means long-term savings.

DIFFERENT ENGINES TO SUIT YOUR NEEDS

Whether you need high efficiency or an optimized stand-alone installation with good load compensation and zero-start properties, it is possible to offer a motor that exactly meets the customer's needs.

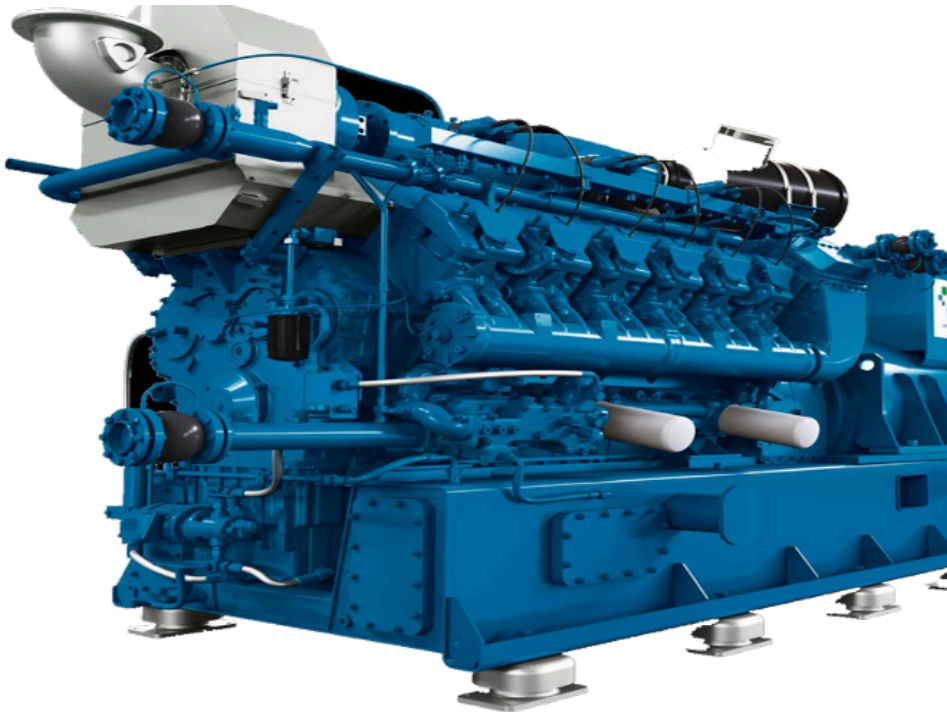
THE CONCEPT OF OPTIMAL MANAGEMENT

TEM (Total Electronic Management) controls not only the engine but the entire system, including the heat supply from the cogeneration Temperature control of each cylinder and anti-knock control provide the best fuel consumption and maximum power output, even if the composition of the gas fluctuates.

FLEXIBLE USE

The latest technologies, such as gas mixers and TEM, allow the use of a wide range of gases. Even the most problematic gases such as mine gas, landfill gas, and gas sewage, can be used without difficulty.

Engine type TCG2020	V12	V12 K1	V12 K	V12	V16K	V16
E. power (kW)	1000	1000	1125	1200	1500	1560
Average effective pressure (bar)	15.5	15.5	17.4	18.6	17.5	18.1
Heat capacity ±8% (kW)	1056	1191	1267	1189	1688	1576
Electric efficiency (%)	43.0	40.0	40.7	43.7	40.8	43.3
Heat efficiency (%)	45.4	47.6	45.8	43.3	45.9	43.8
Overall efficiency (%)	88.4	87.6	86.6	87.0	86.7	87.1



TCG 3016 ENGINE: FROM 0.4 MW TO 1 MW

HIGH EFFICIENCY

- Increased electrical efficiency - up to 45%
- Increased electric power to 2300 kW
- Optimal balance between efficiency and reliability

HIGH RELIABILITY

- Reliable and proven core engine, updated by
- using the most modern technologies
- Provision of up to 80,000 hours of operation before overhaul

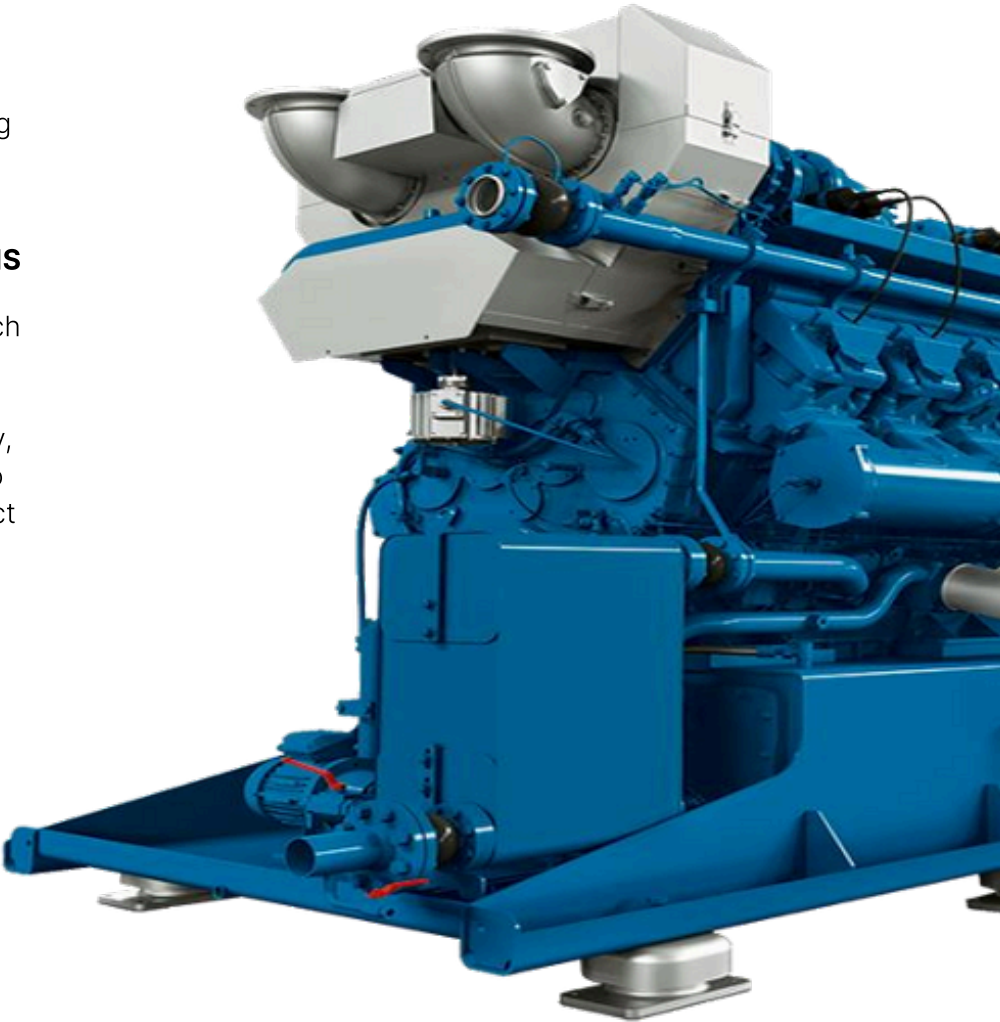
HIGH PROFITABILITY

- High efficiency, low oil consumption: ~0.15 g/kW-h and up to 80,000 h before overhaul ensure low operating costs

TYPES OF GASES AND APPLICATIONS

- Available for various applications such as working on natural gas, biogas, and propane gas
- Optimized options for high efficiency, flexibility and biogas, allowing you to make the right choice for your project needs

Engine type	V12p	V12R	V16p	V16R	V20P	V20R	V20PV	V20RV
E. power (kW)	1380	1380	1840	1840	2300	2300	2000	2000
Average effective pressure (bar)	21.5	21.5	21.5	21.5	21.5	21.5	18.6	18.6
Heat capacity (kW)	1296	1369	1755	1824	2164	2281	1949	2026
Electric efficiency (%)	45.0	44.0	44.7	44.0	45.0	44.0	44.4	43.7
Heat efficiency (%)	42.3	43.6	42.6	43.6	42.3	43.6	43.3	44.2
Overall efficiency (%)	87.3	87.6	87.3	87.6	87.3	87.6	87.7	87.9



ENGINE TCG 2032: FROM 3.33 MW TO 4.5 MW

MORE PROFIT

The optimized maintenance concept with cylindrical blocks improves accessibility and, combined with fewer part types, reduces maintenance time and cuts costs by up to 20%. Additionally, oil consumption is 30% lower compared to other engines.

LONGER WORKING TIME

Thanks to extended service intervals, the TCG 2032 runs 200 hours longer per year than comparable products. Overhaul is planned only after 80,000 hours of operation.

GREATER RELIABILITY

Particle-free combustion with chamber plugs extends heat exchanger service intervals and reduces maintenance costs compared to other methods. Key components like pistons, rods, spark plugs, and cylinder heads are enhanced for higher output and improved electrical efficiency.

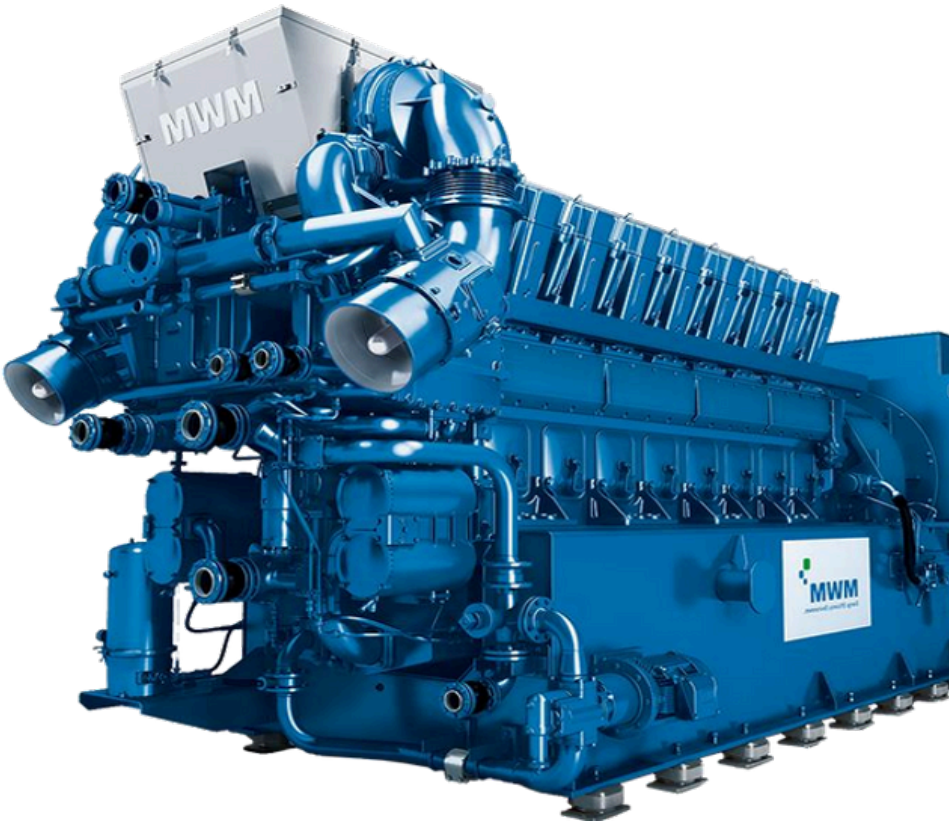
OPTIMUM EFFICIENCY

The interaction of all components has been further improved. All components important for efficiency and power output are controlled by TEM (Total Electronic Management). In particular, the new upgraded bypass valve provides more efficient operation in changing conditions. This also happens when the gas composition fluctuates – thanks to the fast response time thanks to temperature monitoring for each cylinder. TEM controls not only the engine, but also the entire system, including heat removal.

FULL TURBO POWER

The A140 high-pressure turbocharger with an advanced bypass valve allows operation over a wider range of intake air temperatures and at higher altitudes.

Engine type	TCG 2032 V12R	TCG 2032 V16R	TCG 2032B V16R
E. power (kW)	3333	4300	4500
Average effective pressure (bar)	20	19.4	20.3
Heat capacity (kW)	2862	3698	3668
Electric efficiency (%)	43.9	44.1	44.6
Heat efficiency (%)	42.6	42.7	–
Overall efficiency (%)	86.5	86.8	–



INSPIRED BY A CLEAN FUTURE

MWM gas engines are already suitable for operation with a hydrogen admixture of up to 25 % without any technical modifications.

Besides the benefit of lower emissions, the use of hydrogen also affects the efficiency, initial investments, fuel and maintenance costs, and the material quality of the piston engines.



RSE GAS ENGINE MODULAR SOLUTIONS

One of the company's main activities is the production of modular cogeneration units based on MWM engines.

We manufacture ready-to-use cogeneration modules on turn-key basis, and also produce efficient boilers-utilizers to increase the efficiency of the cogeneration plant.





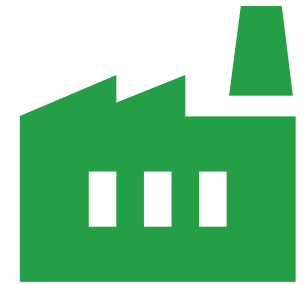
RSE GAS ENGINE MODULAR SOLUTIONS

Ready-to-use modular solutions are equipped with MWM gas engines with a capacity of up to 2300 MW, a cooling system, gas exhaust system, an oil station, a control module, and others.

Today, the Company's production facilities are capable of preparing 20 fully ready-to-use cogeneration modules per month. At the start of 2025, this number will be 40 units per month.



CONTAINER SOLUTIONS OF COGENERATION PLANTS



Container and housing options are alternatives to installation in existing or new buildings. We have extensive experience with pre-assembled containers and modules for motor-generator sets.

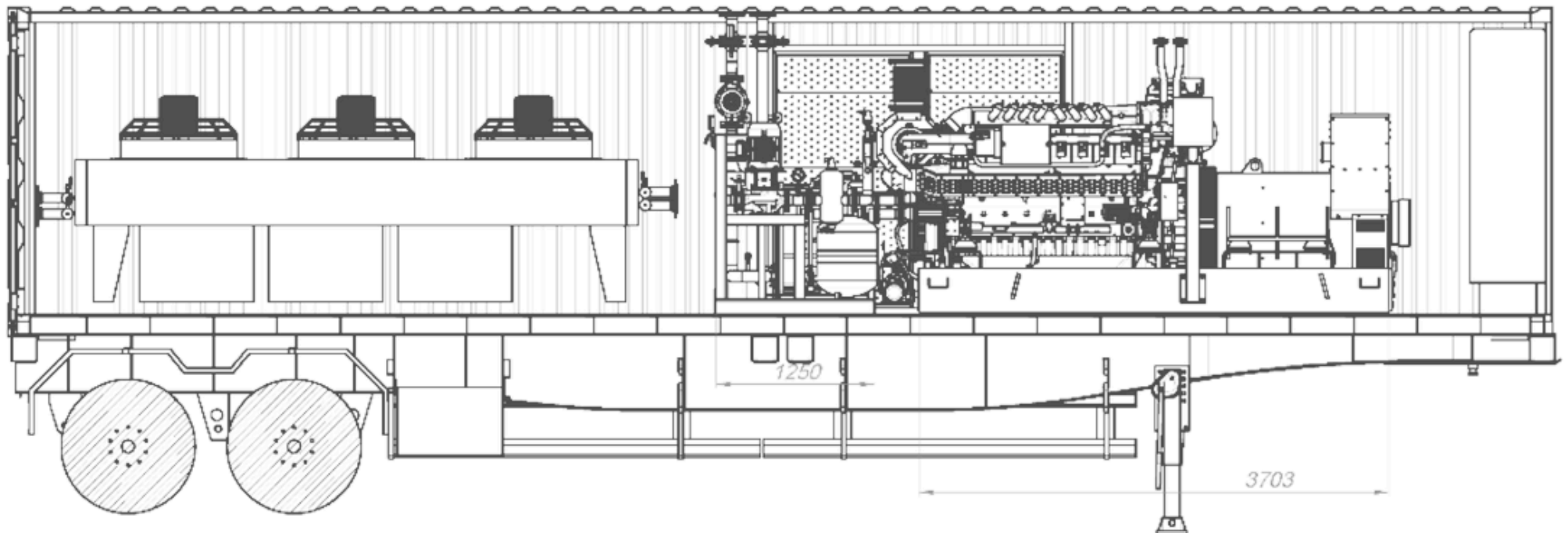
Integrated container modules are fully tested before leaving the manufacturing facility, allowing expedited installation. Space-saving designs minimize field construction, can be assembled on-site, and speed up commissioning.

Customers often require customized solutions to meet specific installation requirements. We are experienced in designing and building custom modules that can be installed on-site, meet extreme sound absorption requirements, and provide weather protection in extreme weather conditions.

RSE gas engine power plants are manufactured in the Czech Republic under the requirements of EU directives.

MOBILE POWER STATION

The production of a **RSE 1000 M** model cogeneration plant on automobile platform based on the **MWM TCG 3016 V16 50Hz** engine, which is a fully autonomous power source, has been launched.



STEAM AND HOT WATER BOILERS ON FLUE GASES

PRODUCTION UP TO 400 UNITS PER YEAR

VWKG boilers



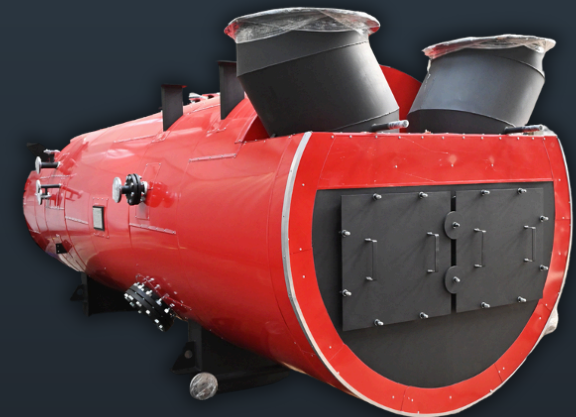
from 440 to 1840 kW

VSKG boilers



from 600 to 1800 kg
of steam per hour

VSKG DOUBLE



from 1480 to 2400 kg of
steam per hour

VWKG BOILERS

CHIMNEY BOILERS FOR HEAT UTILIZATION OF FLUE GASES TYPE VWKG

The automatic flue gas boiler is a heat tube boiler that uses waste heat from internal combustion engines.

Using boilers is particularly advantageous where a continuous source of heat is required. Operation in the overpressure mode on the flue gas side with correctly calculated dimensions of the heating surfaces ensures an ideal use of the heat of the flue gases and, thus, high efficiency.

Boiler type		VWKG 1000H	VWKG 1200H	VWKG 1500H	VWKG 2300H	VWKG 4300H	VWKG 4500H
Rated heat output	kW	440	550	730	980	2150	1840
Boiler efficiency without economizer	%	94-96					
Flue gas temperature at the boiler inlet	°C	410	415	410	380	456	380
Dry flue gas volume	Nm3.h-1	3804	4527	5976	8310	15876	16970
Wet flue gas volume	Nm3.h-1	4260	5066	6686	9320	17800	18970
Operating pressure	bar	6					
Test pressure	bar	9					
Operating temperature	°C	105					
Maximum allowable temperature	°C	110					
Pressure loss on the flue gas side	mbar	15		18		20	
Shipping weight	kg	2200	2640	3524	4700	7000	7000
Flue gas inlet	ø mm	550	580	660	630	1000	1000
Flue gas outlet	mm	400	450	560	630	1000	1000

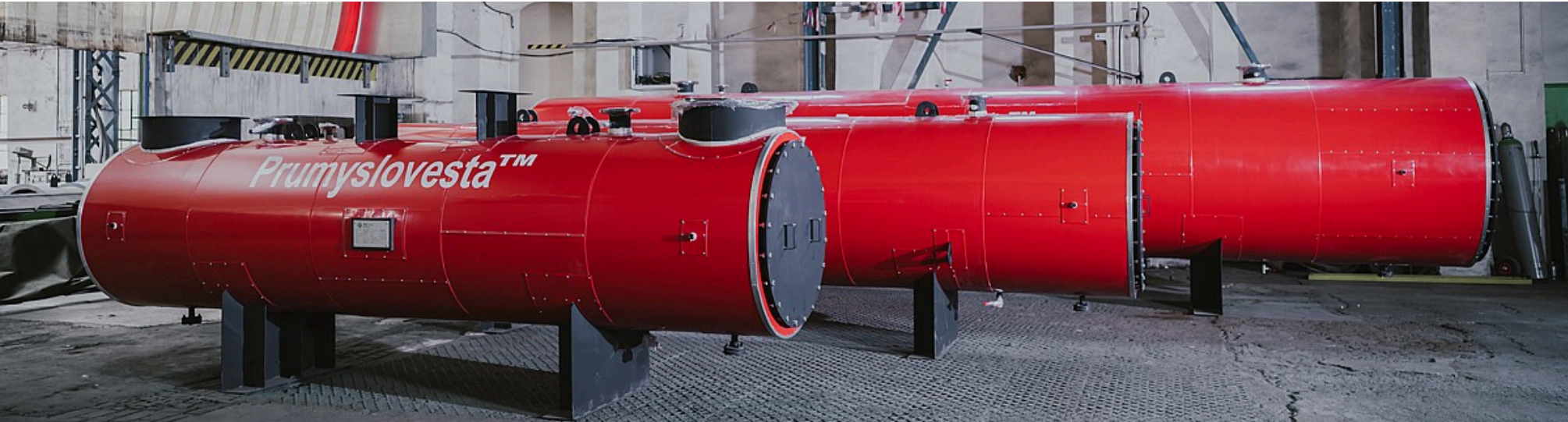


VSKG BOILERS

FLUE GAS STEAM BOILER OF MEDIUM PRESSURE FOR HEAT UTILIZATION OF FLUE GASES, TYPE VSKG

Automatic medium-pressure steam boiler using waste heat from internal combustion engines. The boiler has a two-pass design and two pipe bundles with inlet and outlet flue gas collectors. The working pressure of the boiler is 8 bar, and the temperature is 175 °C.

Boiler type		VSKG 1000H	VSKG 1500H	VSKG 2300H	VSKG 4500H
Steam output(at 105 °C feed water temperature)	t/h	0,6	0,7	0,9	1,8
Rated heat output	kW	420	520	600	1250
Boiler efficiency without economizer	%	90-92			
Flue gas temperature at the boiler inlet	°C	410	420	380	380
Dry flue gas volume	Nm3.h-1	3804	5976	8310	16969
Wet flue gas volume	Nm3.h-1	4260	6686	9320	18964
Operating steam pressure	bar	8			
Maximum allowable steam pressure	bar	10			
Test pressure	bar	18			
Operating steam temperature	°C	175			
Maximum allowable steam temperature	°C	184			
Pressure loss on the flue gas side	mbar	15			
Shipping weight	kg	3600	4485	6400	11780
Water volume at minimum level	l	2100	2320	6060	10480
Steam volume from minimum water level	l	1100	1285	2660	4205
Total volume of the boiler	l	3200	3605	8720	14685
Flue gas inlet	ø mm	750	846	1024	1360
Flue gas outlet	mm	630x400	630x400	900x480	1500x550
Boiler inspection hatch	DN/mm	200	200	320x420	320x420



VWKG BOILERS

FLUE GAS STEAM BOILER OF MEDIUM PRESSURE FOR HEAT UTILIZATION OF FLUE GASES, TYPE VSKG DOUBLE

Automatic medium pressure steam boiler with double layout for utilizing waste heat from the two gas engines simultaneously. Each engine has its own separate flue gas pass. The boiler evaporator is shared. Using VSKG Double saves project costs and boiler room space compared to using separate steam boiler for each engine.

Boiler type		VSKG 1000H	VSKG 1500H	VSKG 2300H	VSKG 4500H
Steam output(at 105 °C feed water temperature)	t/h	0,6	0,7	0,9	1,8
Rated heat output	kW	420	520	600	1250
Boiler efficiency without economizer	%	90-92			
Flue gas temperature at the boiler inlet	°C	410	420	380	380
Dry flue gas volume	Nm3.h-1	3804	5976	8310	16969
Wet flue gas volume	Nm3.h-1	4260	6686	9320	18964
Operating steam pressure	bar	8			
Maximum allowable steam pressure	bar	10			
Test pressure	bar	18			
Operating steam temperature	°C	175			
Maximum allowable steam temperature	°C	184			
Pressure loss on the flue gas side	mbar	15			
Shipping weight	kg	3600	4485	6400	11780
Water volume at minimum level	l	2100	2320	6060	10480
Steam volume from minimum water level	l	1100	1285	2660	4205
Total volume of the boiler	l	3200	3605	8720	14685
Flue gas inlet	ø mm	750	846	1024	1360
Flue gas outlet	mm	630x400	630x400	900x480	1500x550
Boiler inspection hatch	DN/mm	200	200	320x420	320x420

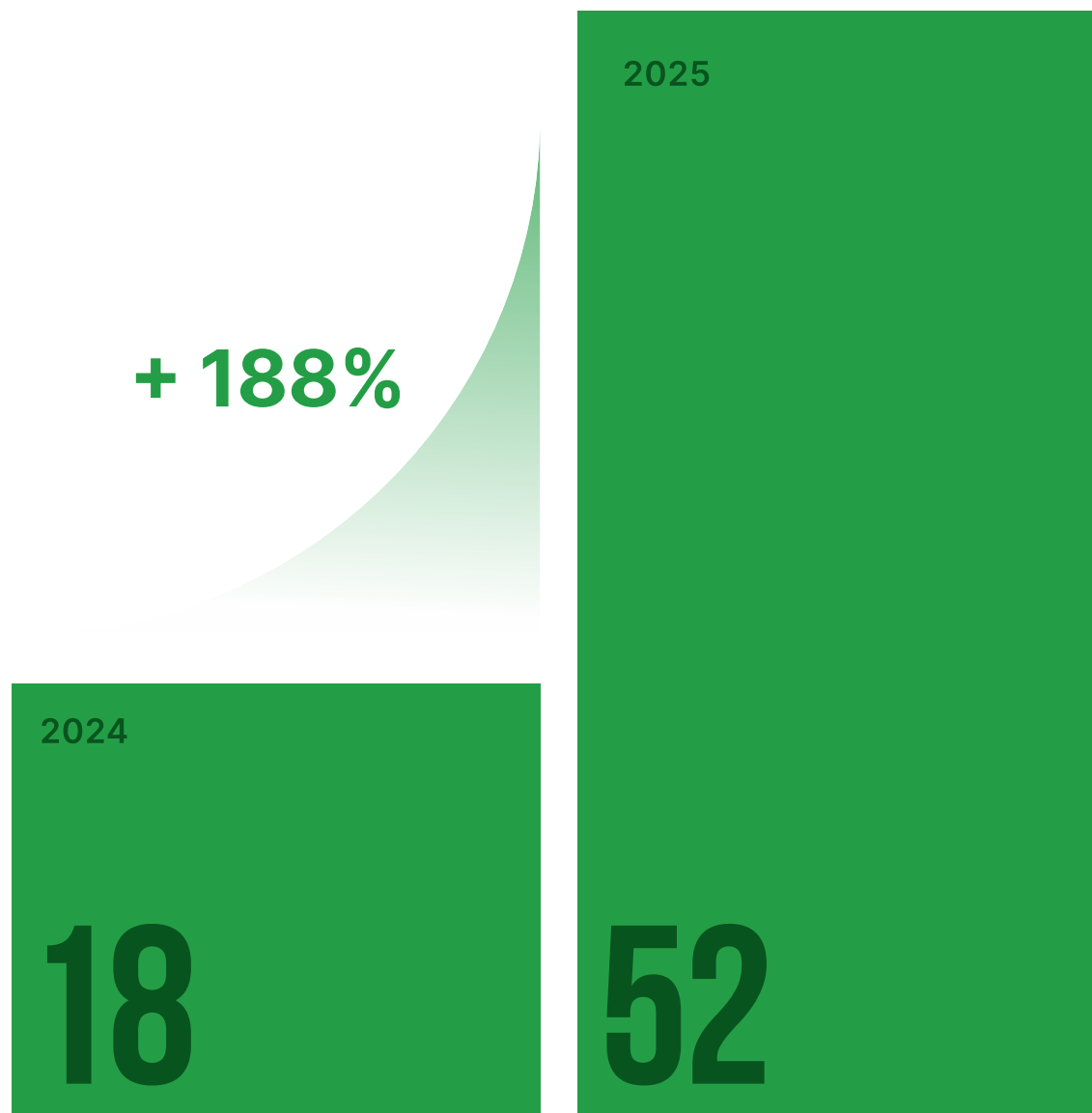


CHP UNITS SERVICE

RSE pays great attention to the proper maintenance and service of cogeneration plants.

RSE's service team includes 18 experienced specialists who have completed training under the MWM program. To ensure the provision of an appropriate level of service, their number will be increased to 52 in 2025.

Own spare parts warehouse in Brno and Kyiv.



COMMISSIONED PROJECTS

UPG

Energy solution for the regionals grids



AVANGARD

Sustainable energy for livestock farms and agribusinesses



MHP

Providing heat and electricity for production processes



FARMAK

Supply of heat and electricity for production needs



EPICENTRK

Stable power and heat source for large-scale production



KOSTOPOL GLASS WORKS

Solution for business



KOROSTENS`KIY MDF PLANT

Energy independence for industrial facilities



KULINICHI

Optimized power and heat supply for industrial processes



OUR TEAM



Andrii Grinenko

Founder



Volodymyr Makhnovets

CEO



Natalia Korelska

Deputy Director



Ivan Samusenko

Technical Director



Roman Havrylenko

Director of Container Cogeneration
Plants production department



Roman Yaskiv

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