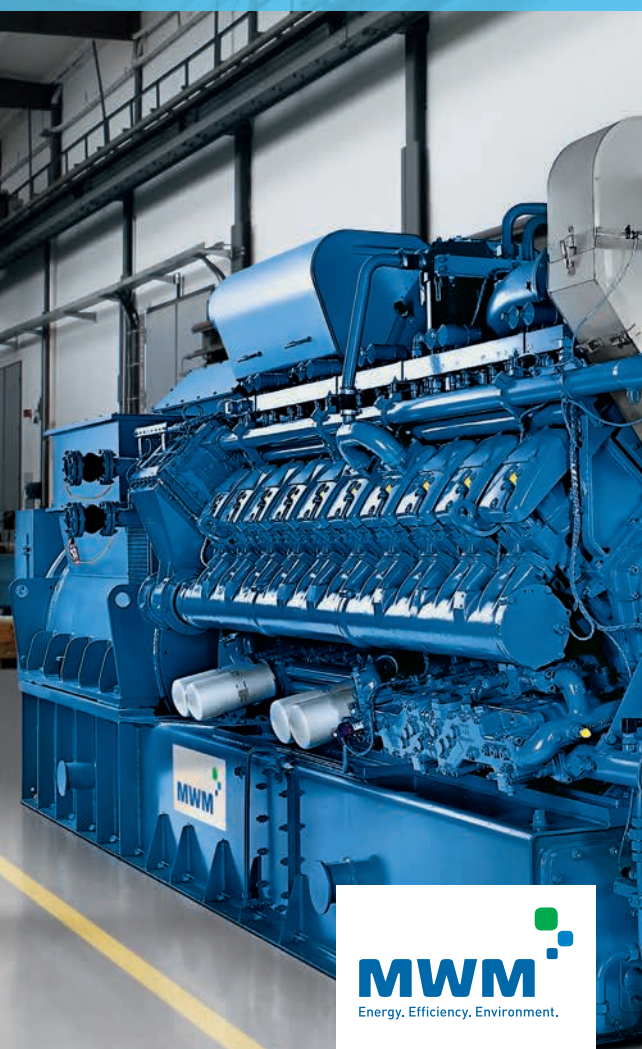


Energy.
Efficiency.
Environment.

www.mwm.net



MWM
Energy. Efficiency. Environment.

140 years of experience with energy



Energy

Ever since 1871, MWM has been developing and building engines and gensets in Mannheim that can supply electricity, heat, and cooling highly efficiently. Our customers enjoy economical cost-to-performance throughout the entire life-cycle of the equipment.

Efficiency

MWM's efficiency benefits pay off longterm for all of our customers. That's because components configured and tuned to their particular requirements provide the maximum possible efficiency. To this end we offer a comprehensive range of services that guarantee long-term efficiency.

Ecology

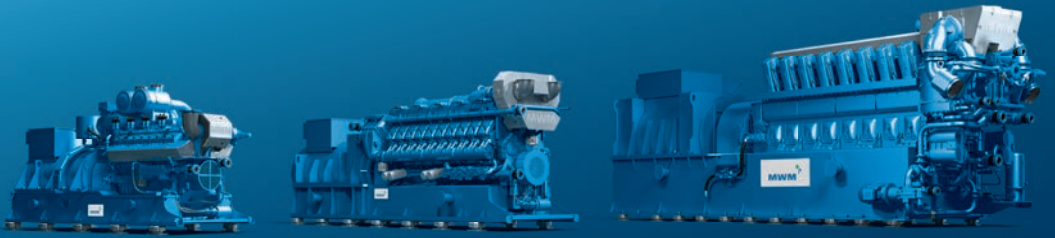
Thanks to its fuel-saving technology, MWM is almost unequalled in the way it deals with natural resources. At MWM, ecology goes hand in hand with economy. Our objectives are responsibility and sustainability, and that pays off for our customers.



- 1871: Carl Benz, the inventor of the automobile, founds the "mechanical workshops" in Mannheim
- 1880: Production of the first stationary gas engine at MWM
- 1886: Patent no. 37435 is issued for the Patent Motor Car
- 1899: Transformation into Benz & Cie., Rheinische Gasmotorenfabrik AG
- 1910: Start of the manufacture of diesel engines
- 1953: Start of the manufacture of air-cooled small diesel engines
- 2005: DEUTZ Power Systems enters the market as system provider
- 2007: The private equity house 3i takes over DEUTZ Power Systems
- 2008: Return to the historic name MWM
- 2009: Introduction of upgrades for all genset series with more power and efficiency
- 2011: MWM is becoming part of Caterpillar Inc., USA
- 2013: MWM becomes Caterpillar Energy Solutions GmbH

MWM Gensets

Efficient and low-maintenance at high availability



TCG 2016

TCG 2020

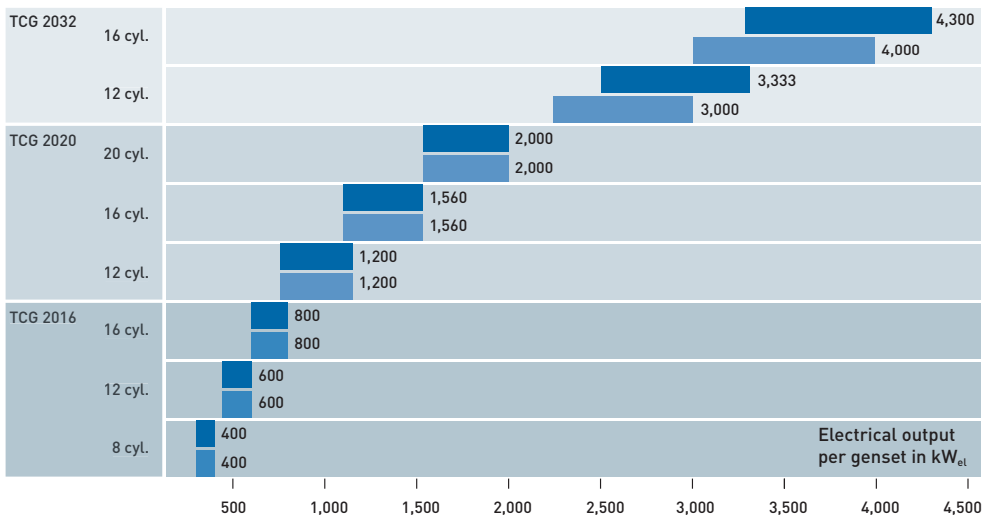
TCG 2032

Gensets can be operated with natural gas, biogas, landfill, sewage, and coalmine gas as well as a wide variety of special gases.

State-of-the-art control system for genset and CHP plant: The monitoring of combustion temperatures ensures efficient operation even with fluctuating gas qualities.

MWM gensets offer you

- ✓ Higher profits due to excellent efficiencies
- ✓ Low operation costs based on long service intervals and maintenance friendly engines
- ✓ Full power range between 400 kW_{el} and 4,300 kW_{el}

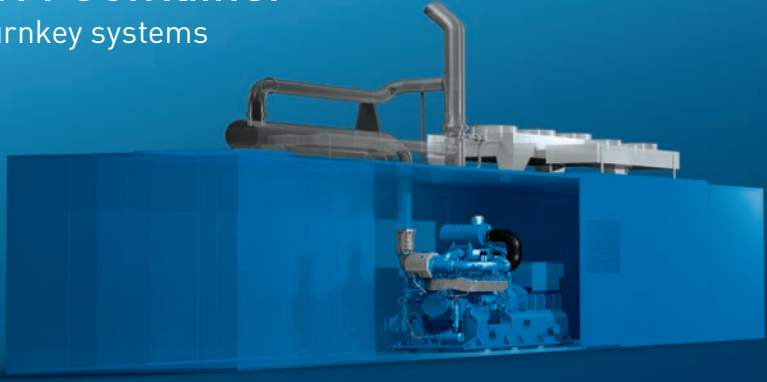


With our gensets we can cover a power range from 400 kW_{el} to more than 100 MW_{el} for decentralized power production.

Legend: 50 Hz 60 Hz

The MWM Container

Complete turnkey systems



- Planning, configuration, installation, service – everything from a single source and tailored precisely to your needs
- Can be used for natural gas, biogas, landfill gas, sewage gas, mine gas, and other special gases
- Comprehensive concepts, such as systems that include gas preprocessing
- Easy to transport, quick to erect

Reliable efficiency

- ✓ Quality – made in Germany
- ✓ Worldwide references
- ✓ Leading cogeneration expertise
- ✓ Customized designs for use under all kinds of conditions
- ✓ Long service intervals

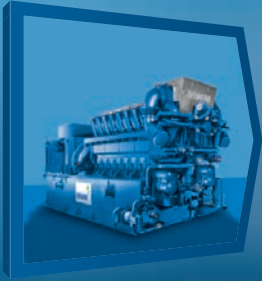
Includes top-level service

- TEM enables direct online access to current engine readings during operation. This means faults can be diagnosed instantly
- Complete service directly from the manufacturer of the genset
- Service-friendly design
- Worldwide service network and logistics
- Time-saving maintenance concept



Our solutions

Engine. System. Service.



Our competence

Cogeneration

Natural gas is an important market segment that MWM covers in the best way possible with its gas engine plants for various areas of application.

Special Gas

This fast-growing segment comprises the field of biogas as well as combustible gas emitted by the industry, raw material production and mining.

Greenhouse

Systems for powering and heating greenhouses and fertilizing the plant with cleaned waste gas.

Products and services

Gensets

- Gas engines
- Generation of electrical energy from 400 to 4,300 kW_{el} per unit

Combined heat and power generation

- Project-specific component scaling
- Modular concepts for maximum efficiency
- Use of waste heat

One-stop solutions

- Consulting, design, engineering
- Complete setup and commissioning of a plant

Service

- Worldwide customer service, maintenance and servicing of plants, training centers

MWM – successful worldwide.

Precision Energy, Bangladesh

In 2010, MWM shipped 15 TCG 2032 V16s to Precision Energy Bangladesh within just three months. The gas engines produce a constant overall output of 60 MW_{el}. All of the electric energy that has been generated is fed into the public grid. More information about this project can be found in our MWM movie "60 MW Around the World" at www.mwm.net.



BGA Anderlingen-Ohrel, Germany

The company Burfeindt-Tomforde Energieerzeugung relies on MWM. A TCG 2016 V08 C producing 400 kW_{el} generates 3,200 MWh of electricity and 2,552 MWh of heat each year. It is used to operate a biogas plant and to supply a district heating network. An integrated biogas processing system from MWM secures the emission reduction bonus provided by Germany's Renewable Energy Law.



Agricultura y Exportación, Spain

The natural gas-powered engine from type TCG 2020 V20 has an electrical power of 2 MW_{el} and a high overall efficiency due to the heat recovery. Because of the special exhaust aftertreatment based on SCR technology, the exhaust gases can be used for CO₂ fertilization.



Italiana Coke, Italia

Every year, the leading Italian coking plant Italiana Coke SPA produces about 500,000 tons of coke. Due to the fine experience made with MWM gensets, four old engines were replaced with four new TCG 2032 V16 units. MWM GmbH has extensive experience in the operation of gas engine gensets with coking gas around the globe.



Atlas Copco, Germany

Atlas Copco, a leading manufacturer of generators, makes use of MWM engines (TCD 2016, 50/60 Hz) due to their extraordinary performance. The global availability and the excellent aftersales service guarantee a long useful life and smooth operation.



Taiyuan City Coal Mine, China

MWM equipped Taiyuan's state coal mine with a total of three Type TCG 2020 V20 units. The system utilizes gases from the mine in order to generate electricity. This process obtained CDM certification and generates additional revenues from the sale of CO₂ certificates. The MWM Container made a good impression – and the operator has ordered another four of the TCG 2020 V20 since then.



Power Plant Chevron Helder, North Sea

The Helder oil drilling rig gets its power from two TBG 620 V16 units plus a new TCG 2020 V20. Together, the gensets generate an output of 4.65 MW_{el}. The generated heat is used for heating and providing hot water on the rig. Here too, reliable isolated operation is imperative.



Ämmässuo Landfill, Finland

The 50-acre landfill in Ämmässuo, Finland, uses the landfill gas resulting from the fermentation of waste in four TCG 2032 V16 units. This is the first landfill gas plant with engines of the TCG 2032 series. The main challenge for MWM was the low heating value of the gas, which required a separate gas train for each cylinder bank. The project was honoured with the National ENERGY GLOBE Award Finland in 2012.



Caterpillar Energy Solutions GmbH

Carl-Benz-Straße 1
DE-68167 Mannheim
T +49 621 384-0
F +49 621 384-8800
info@mwm.net

For additional MWM locations, scan the QR code or visit the website www.mwm.net/en/mwm-worldwide

