

Greenhouse/CHP

Thinking ahead about profitability.





MWM Greenhouse – for profits that continue to grow, too.

The future belongs to cogeneration, or CHP. We are facing high energy prices and, as an entrepreneur involved in greenhouse cultivation, you will be experiencing this at first hand. More and more entrepreneurs are therefore acknowledging the many advantages of decentralised power generation and want to benefit from this to the full.

With the conventional (centralised) method, a large proportion of the output is wasted due to heat loss. This is not the case with CHP. With CHP, heat and power are generated 'on site'. Decentralised power generation, therefore, using gas as fuel. As the power is generated locally, little energy is lost.

In order to get the most out of your investment in CHP, it is important to take a specialised, 100% transparent and experienced partner on board. That's where MWM comes in.

MWM has been a global leading light in the field of engine and system expertise for decentralised power generation for 140 years. And one of our specific areas of expertise is greenhouses.

How you benefit, at a glance

- Fuel-independent: e.g. natural gas and biogas
- Energy savings in comparison with conventional systems
- Guaranteed CO₂ reduction
- Not dependent on scale
- Not dependent on third parties
- Extra returns by selling electricity
- Attractive payback period



Our energy for our clients. From the first day on.

Inventory and advice

The process usually begins with a request for an offer, which we follow up within just a few work-ing days. This is followed by an initial meeting and an extensive technical inventory. On the basis of this inventory, we present a substantiated plan of approach for your CHP installation – naturally taking optimum account of your requirements, wishes and specific situation.

Positioning and assembly

When all licences are in order and the installation has been designed to everyone's satisfaction, the delivery and assembly of your CHP installation is scheduled. Together with a team of carefully selected suppliers, we direct the whole process from our office in Rotterdam. In advance, we make it perfectly clear what our responsibilities are and what you need to take care of. This means clarity for all concerned.



Testing and starting up

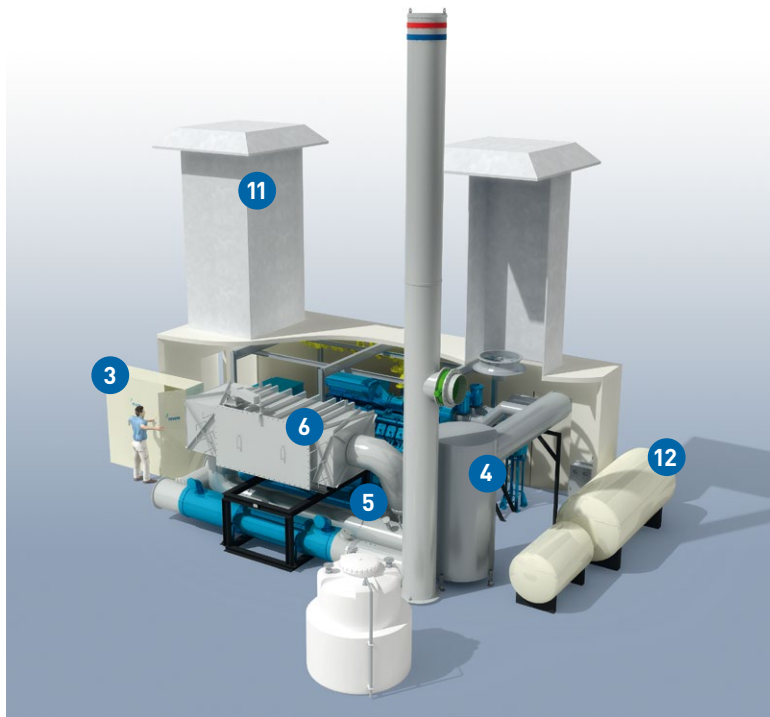
Once your CHP installation has been fully positioned and assembled, an exhaustive testing phase follows. If this is completed successfully, your CHP can finally be put into operation. Normally, it takes no longer than six months between the date of the order and the point at which your installation becomes operational.

After-sales and service

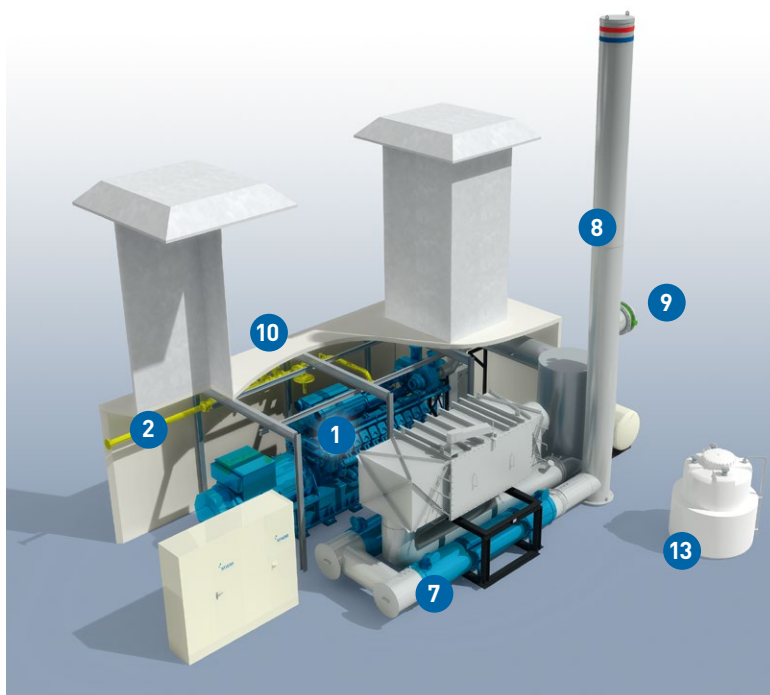
Even after your CHP installation has been delivered and is operational, you can fall back on us. Often, a CHP installation supplied by MWM comes with an all-in service agreement for 63,999 hours, as standard. All minor and major servicing is included in this, as well as remote inspection of the service monitoring system and changing the blocks in the flue gas purifier. Our service engineers are located all over the country, so they're never far away.



CHP installation – how does it work?



- 1 Engine
- 2 Gas train
- 3 Control panel
- 4 Silencer
- 5 Urea injection
- 6 Exhaust gas purifier
- 7 Exhaust gas coolers
- 8 Chimney
- 9 CO₂ connection
- 10 Acoustic enclosure
- 11 Ventilation shaft
- 12 Oil tanks
- 13 Urea tank



Get the most out of your CHP. A closer look at the advantages.

Optimum efficiency

This means that with a CHP installation, you don't just produce heat. It requires little extra fuel, relatively speaking, to generate heat and power simultaneously. At any rate, less than when generating heat and power in separate installations. With CHP, total efficiency when converting fuel (gas) into power and heat is usually over 90%. Specific measures can even lead to total efficiency of almost 100%.

Attractive payback period

As a greenhouse owner, you can use all of the heat generated yourself. If you combine CHP with a flue gas purifier, you yourself can also make good use of the CO₂ released. The extra profit that can be made from a CHP installation is related to the simultaneous generation of electricity. You can sell back any electricity you do not need yourself to the power company. Depending on the spark spread (difference between the price you get for the electricity you sell and the price you paid for the gas to produce it) and possible subsidies towards your investment in a CHP installation, the payback period for your investment could be just a few years.

Efficient MWM Greenhouse systems exploit the energy generated by natural gas or special gases for heating and lighting of the greenhouse. The processed CO₂ generated in the combustion process can also be used as fertiliser.



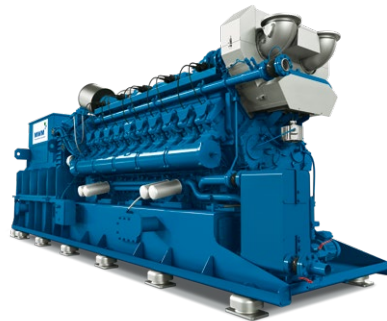


Turnkey, trouble-free. MWM turnkey systems from a single source.

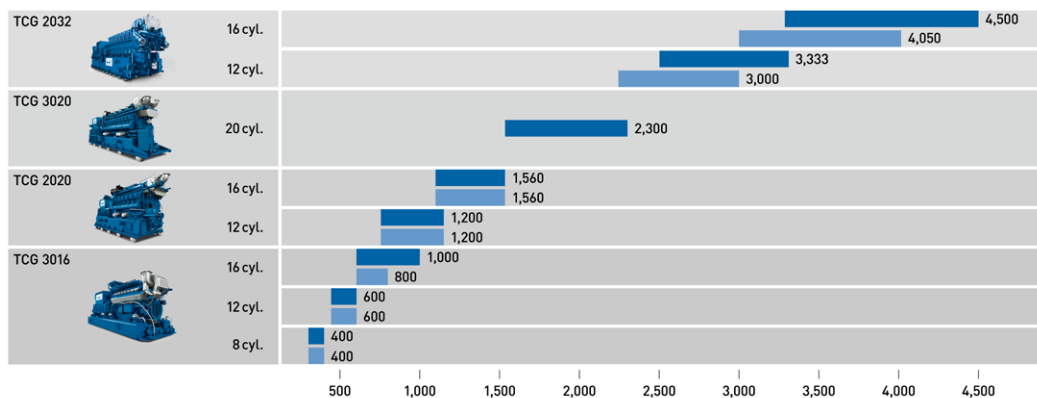
MWM engines

The pulsing heart of every CHP installation consists of an extremely solid MWM engine. The MWM engine is characterised by high performance, high efficiency (and thereby low gas consumption), high quality and maximum reliability.

We offer a wide array of different services – supplying the most efficient solution for your specific needs.



TCG 3020



With our gensets we can cover a power range from 400 kW_e to more than 100 MW_e for decentralized power production.

Electrical output per genset in kW_e 50 Hz 60 Hz

Exhaust gas system

CHP installations from MWM are supplied with a complete exhaust gas system. Components of this include a flue gas cooler and condenser, silencer and chimney. A large part of the system is produced in durable stainless steel. If a flue gas purifier is applied, the minimum 10-metre-high chimney has a CO₂ connection with an electrically operated CO₂ valve with a 100% seal.



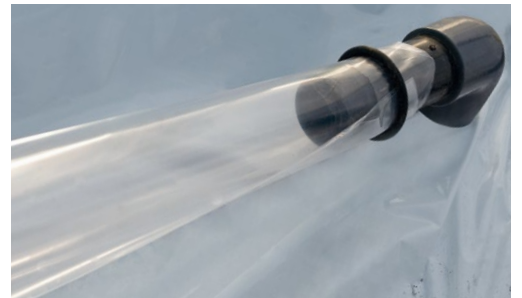
Outer casing is tailor-made

You can choose to have your CHP installation indoors or outdoors. In both cases, we provide your installation with an acoustic enclosure in a whole range of colours. Together, we decide the size of the desired soundproofing for the casing. With a view to the environment and outward appearance, the floor in the casing has a watertight epoxy coating as standard.



CO₂ fertilisation

Catalysts are used to purify the waste gas produced by the engines. A heat exchanger cools the gas and the extracted heat is then used to heat the greenhouse. A blower system is used to transport the purified and cooled CO₂ into the greenhouse, where it acts as an "airborne fertiliser" and encourages a very substantial plant growth. Measuring equipment is in place to monitor the quality of the CO₂ that is fed into the greenhouse.



Main current and control panels and cables

We supply your CHP installation including low voltage and control panels. If we deliver a 10 kV generator, the medium voltage distributor and medium voltage cables from this generator to the distributor are not included in our scope of supply.

The engine management system is controlled and monitored automatically. All relevant information on power, temperature and possible faults is presented clearly on a touch screen. The software automatically reports any faults to our troubleshooting service, which operates around the clock, so that we can take action immediately. In many cases, we can also resolve problems from a distance.



Greenhouse. Top Performance from MWM – used successfully worldwide.

CHP for every crop

In principle, a CHP installation is an appealing option for anyone involved in greenhouse cultivation. Both in terms of corporate social responsibility and from a financial perspective. If you wish to adopt a responsible attitude to energy and get as much out of your company as possible, CHP is the solution you need. By optimising existing technologies and applying intelligent solutions, CHP can open new doors to the future for you.

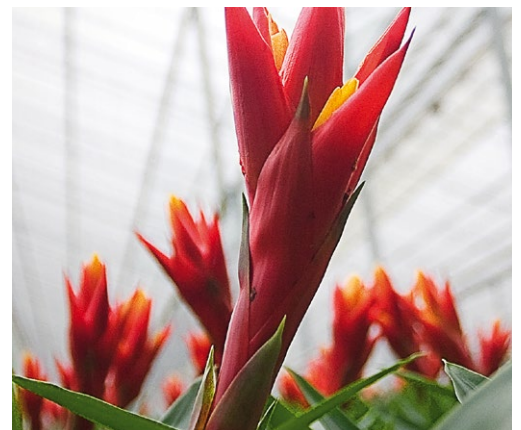
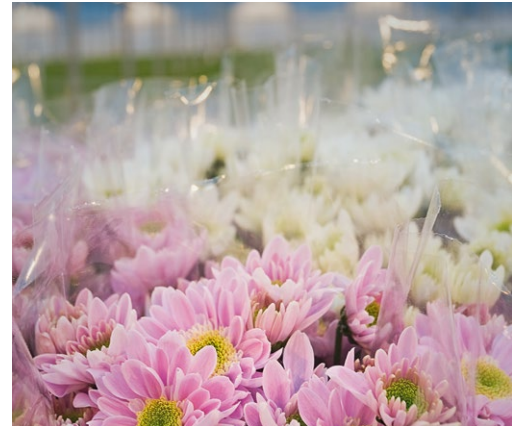
As one of the leading and most rapidly growing players in this field, we are assisting increasing numbers of greenhouse businesses. Whatever your crop – flowers, potted plants or vegetables – MWM can deliver the complete turnkey CHP installation, which links up perfectly with the needs of your company.

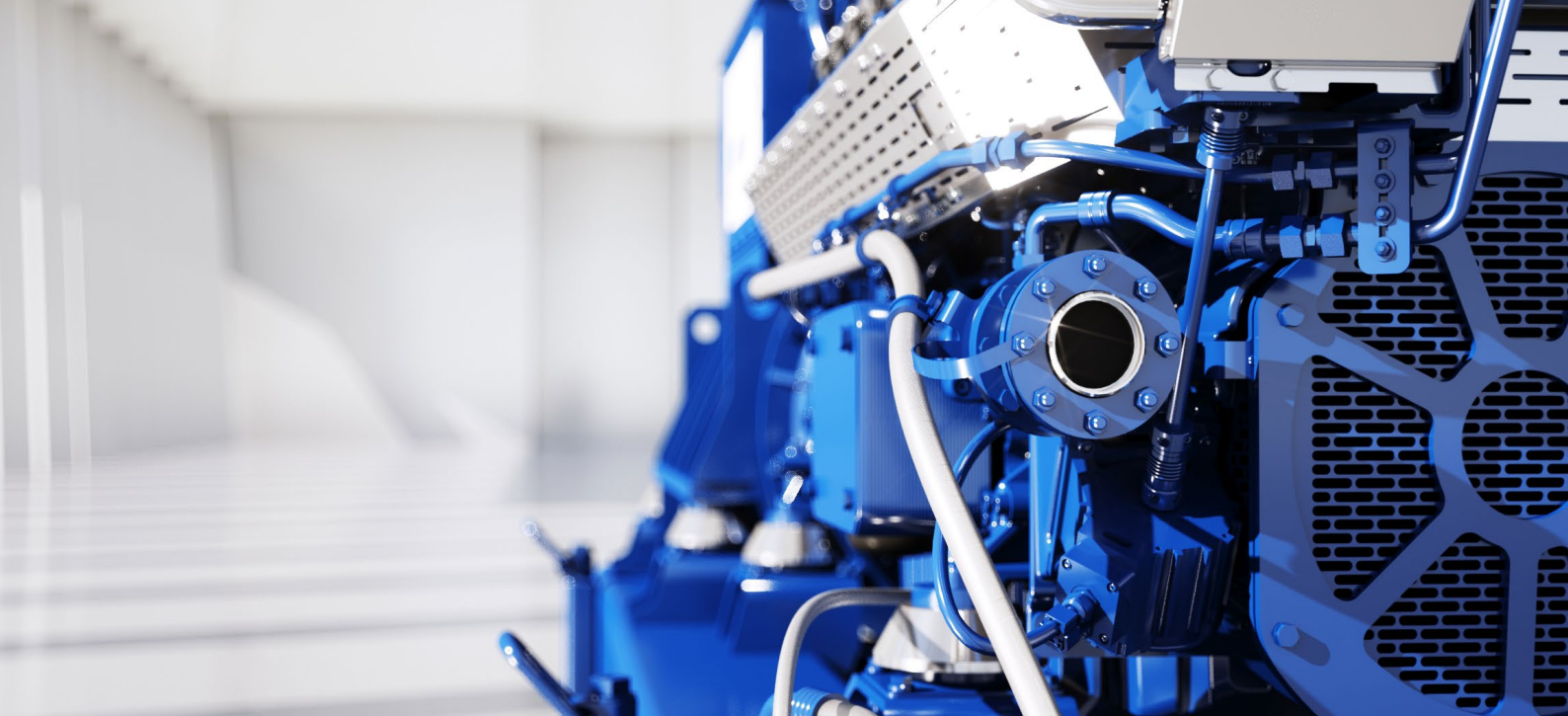
Great references

In the long history of our company, we have built up an extensive clientele. And we are extremely proud of this.

Hundreds of CHP installations supplied by us are now up and running in the Netherlands and beyond.

We have specific project descriptions for a number of projects. You can request these at www.mwm.net.





Strong arguments for a strong brand: MWM.

MWM has 150 years of experience

MWM has made a tradition out of innovation. We have been developing and building engines and gensets for a wide range of uses since 1871. Our global success is founded on having invented the most advanced four-stroke diesel engines. And, 30 years ago, we became one of the first manufacturers to revolutionize generator technology using high-performance gas engines. To this day we continue to work constantly on making our systems more efficient.

MWM understands what's really needed

Efficiency – today that's all that counts! MWM offers cooperation all along the line, which pays off right across the process chain. We are the complete partner to our customers. From the selection of the system layout for the project, all the way to service and repair.

MWM offers the most economical service concepts

With its worldwide service network, long service intervals and low maintenance costs, MWM Service is an important factor for lasting efficiency. Innovative offerings such as remote diagnosis, remote parameter configuration and the generation of operating values can be provided cheaply anywhere in the world using

the Internet. The new MWM Logistics Centre also means fast deliveries and low spares costs. Shortblocks can be delivered and assembled easily, so your system will be ready for operation in the shortest possible time. Another benefit is that our own training centre offers top-level, practically oriented courses for your technicians.

MWM thinks in terms of the complete solution

Only if all of the components in your system are selected and configured perfectly for your needs will you achieve optimum overall efficiency. We have the experience, the technology and the capacity. Our engineers can develop tailor-made complete solutions especially for you. From comprehensive cogeneration concepts for electricity, heat and cooling, to containerized solutions, to turn-key systems – MWM can develop complete concepts to suit your needs, and implement them reliably too. All in all, system engineering just the way you want it.

You can rely on MWM

Clear statements, transparent offers: we stand by our word. We are always there when you need us. Test us – on site, at your plant.

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