WBPS
POWER YOU CAN TRUST

2G®

2G. Product range.

CHP plants for distributed generation of heat and power.
Highly efficient and reliable. 20 to 4,500 kW.

2G. Cogeneration.

Global success with cogeneration.

A power plant by 2G is the ideal solution for anyone wanting to reduce energy costs in the long-term and wishing to protect themselves against further increases in the price of electricity. As a pioneer, innovator and one of the world's leading manufacturers of distributed power generation systems using cogeneration (also known as combined heat and power or CHP), we have commissioned thousands of technologically advanced, highly efficient CHP plants since 1995.

Satisfied customers in more than 50 countries confirm the quality, performance and reliability of our products and solutions. 2G is listed as a publicly traded company on the Entry Standard of the German Stock Exchange and has a workforce of more than 650 employees.

The 2G product range includes CHP plants ranging in electrical output from 20 kW to 4,500 kW.

Contents

The technology of the future.

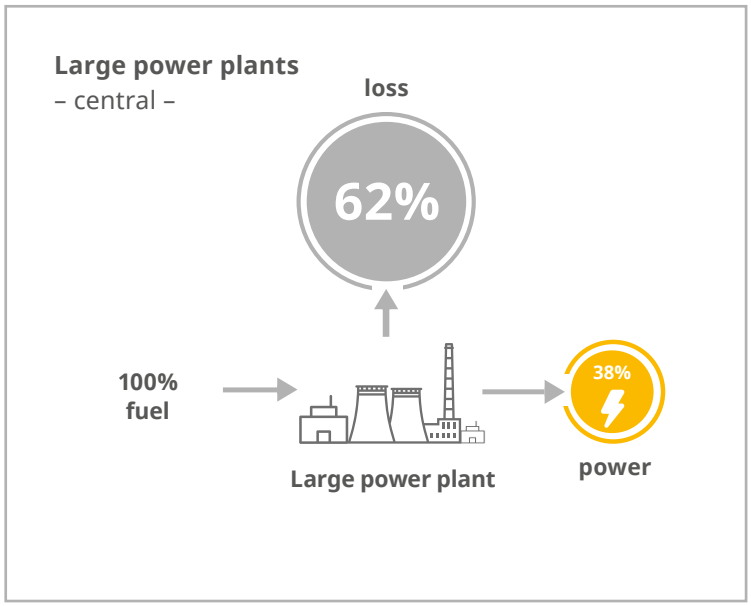
The power grid of the future will not be made up of a few large power plants but rather of many small ones. As part of the transformation of the energy sector, cogeneration plants (also known as Combined Heat & Power plants (CHP)) are increasingly gaining importance in intelligently networked energy systems – so-called virtual power plants – due to their distributed nature, controllability and predictable availability. With a plant by 2G you can also make a contribution to a stable, clean energy supply of the future.

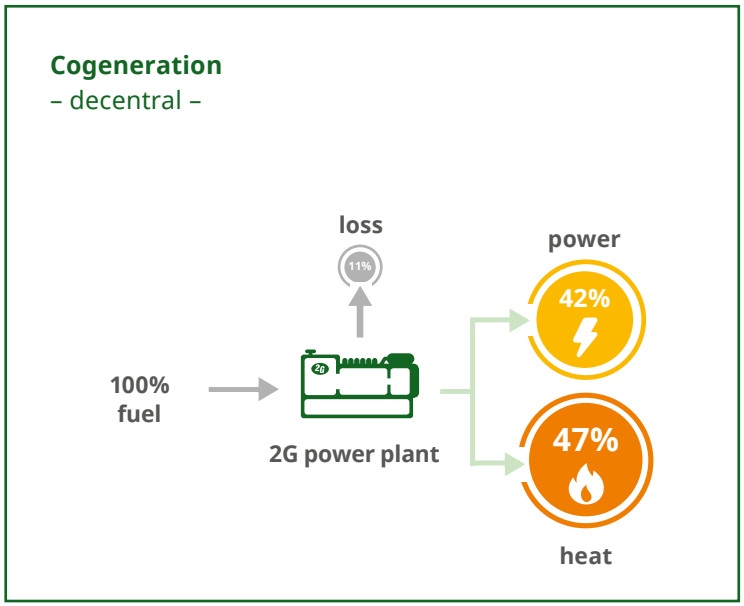
High efficiency and climate compatibility.

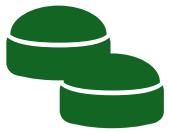
The simultaneous generation of mechanical energy and useful heat is described as cogeneration (CHP). While the mechanical energy is converted straight into electricity, the heat can be used for heating, cooling or generating steam (see page 25).

Thus the heat arising during the production of electricity does not simply escape unused into the atmosphere but is put to practical use. This is what makes the technology of cogeneration so efficient and climate-friendly. It saves up to 40% in primary energy. CO_2 emissions drop by up to 60% compared to conventional power generation in large power plants.

Comparison of distributed and centralised power generation.







Biogas Plants

Office and Administration Buildings

Chemical and Petrochemical Industry

Landfill Sites

Shopping Centres

Horticultural Businesses

Hotels

Industry and Commerce

Sewage Treatment Plants

Many different areas of use.

2G power plants have already demonstrated their strengths in many places, e. g. in residential buildings, office and administration buildings, nurseries, schools, hotels, senior citizen centres, hospitals and a wide variety of industrial and commercial businesses. Nowadays, virtually every business is suitable for the use of cogeneration.

Hospitals

Agricultural Businesses

Food Industry

Public Facilities

Dater Centres

Schools and Universities

Swimming Pools

Senior Citizen Centres

Sports and Event Centres

Heating Networks

Hydrogen

Residential Buildings

We set standards.

Power plants by 2G for the cogeneration of power and heat have proven their value for many years. We set standards in the industry with reliable, leading-edge technology that’s Made in Germany with outstanding local service.

Leading-edge technology Made in Germany.

Together with prestigious universities and research institutes, our group's own research and development centre, 2G Drives, works continuously on improving the 2G engine technology and promoting innovations. As a result, we have successfully achieved significant increases in efficiency.

Certified series production.

A high degree of vertical integration and series production certified in accordance with DIN ISO 9001 guarantee the consistently high quality of 2G power plants.

Highly developed control technology.

The 2G control technology enables a variety of flexible running modes in on/off or part load operation. Every 2G power plant is infinitely adjustable between 50 and 100 percent load. Effective analysis tools which have revolutionised remote maintenance and service are an integral part of the sophisticated control concept.

Verified grid compliant.

The 2G power plants can be integrated in virtual power plants. They meet the requirements of local voltage guidelines and are suitable for selling the electricity generated on the energy market.

g-box

Profitable small power plant.

The g-box. Perfect for hotels. Further areas of use, see p. 8/9.

Profitable small power plant.

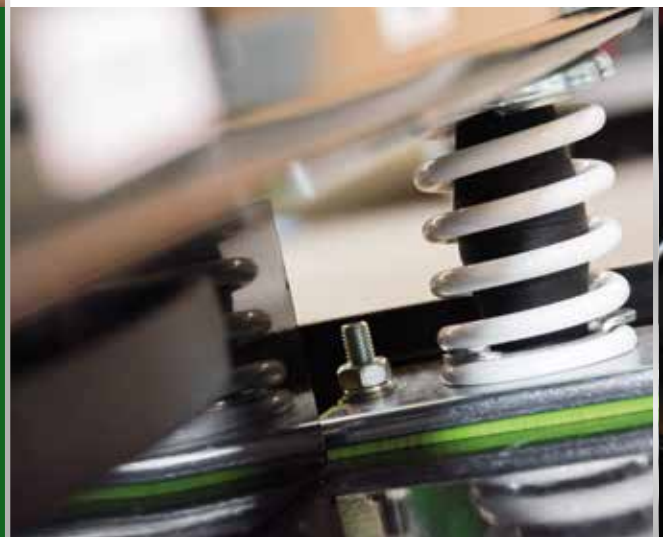
The g-box is the profitable small power plant by 2G ranging in electrical output from 20 to 50 kW. It is supplied as a connection-ready compact module. The control cabinet with PLC controller and operating unit is designed as a separate unit on the module. The g-box not only works extremely efficiently but also very quietly, thanks to the fully enclosed sound capsule.

- Connection-ready, super-silent compact module
  g-box 50 with max. 55 dB (A) at a distance of 1 m
  g-box 20 with max. 52 dB (A) at a distance of 1 m
- Very economical due to high thermal efficiency thanks to condensing technology (as standard)
- Long operating times, reliable and low-maintenance
- Possible incorporation into tight building spaces thanks to the modular design
- Completely water-cooled, no need for dedicated ventilation system thus reducing installation costs

g-box. 20 to 50 kW.

Type	Configuration	Electrical output	Thermal output
		Natural gas	Natural gas
g-box 20	as22-4	20 kW	44 kW
g-box 50plus*	as70-4	50 kW	104 kW

* Also available as a HT version with a flow temperature up to 95 °C.
Efficiency levels, see p. 28-31. Installation options, see p. 22-23.



aura

Clean and efficient.

The aura. Ideal for city centres. Further areas of use, see p. 8/9.

Clean and efficient.

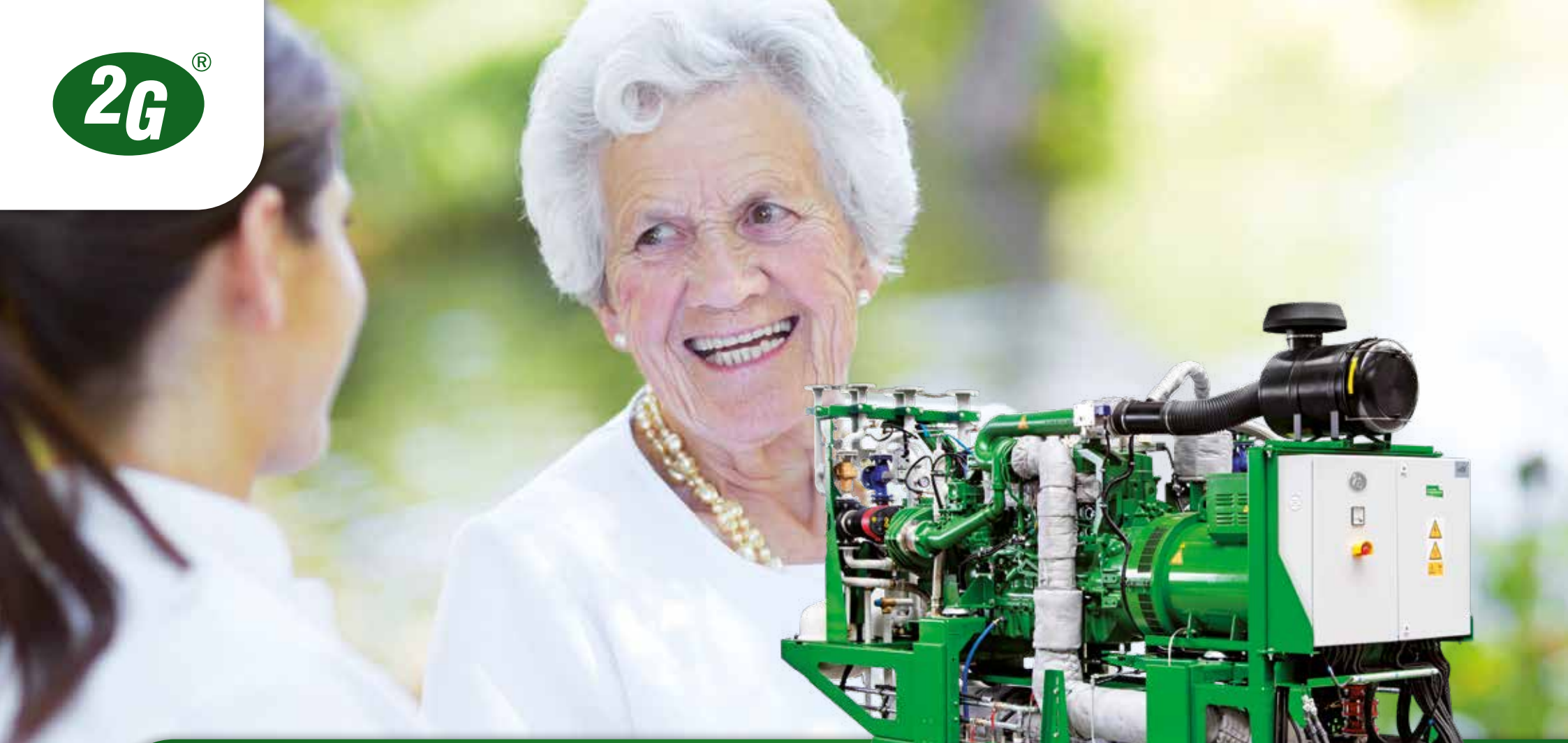
Equipped with 2G's proprietary Lambda 1 technology and low-charged turbocharger, it is also characterised by extremely low exhaust emissions and meets, in particular, the increasingly stringent requirements for low nitrogen oxide limits.

- Low emissions
- High heat efficiency
- Reliable, service-friendly engine
- Higher performance of 15% compared to conventional systems with the same displacement
- Designed as ready-to-connect compact module

aura. 100 to 420 kW.

Type	Configuration	Electrical output	Thermal output
		Natural gas	Natural gas
aura 404	bt70-4	100 kW	176 kW*
aura 406	bt70-1	170 kW	260 kW
aura 408	bt70-1	280 kW	408 kW
aura 412	bt70-1	420 kW	611 kW

* Calorific flue heat exchanger on board.
Efficiency levels, see p. 28-31. Installation options, see p. 22-23.



agenitor

Evolution in efficiency.

The agenitor. Perfect for electricity driven demand. Further areas of use, see p. 8/9.

Evolution in efficiency.

The agenitor by 2G is the result of intensive work by the development team at 2G Energietechnik GmbH. Improving combustion chamber geometry has made it possible to increase the efficiency of the agenitor range significantly.

- Highly efficient power plant with optimised gas engine – and therefore lower fuel costs
- Modular design facilitates installation in hard to reach places
- Very reliable even in regular start-stop operation thanks to highly wear-resistant engine components
- Rubust with low-maintenance

Efficient today. Climate-neutral tomorrow.

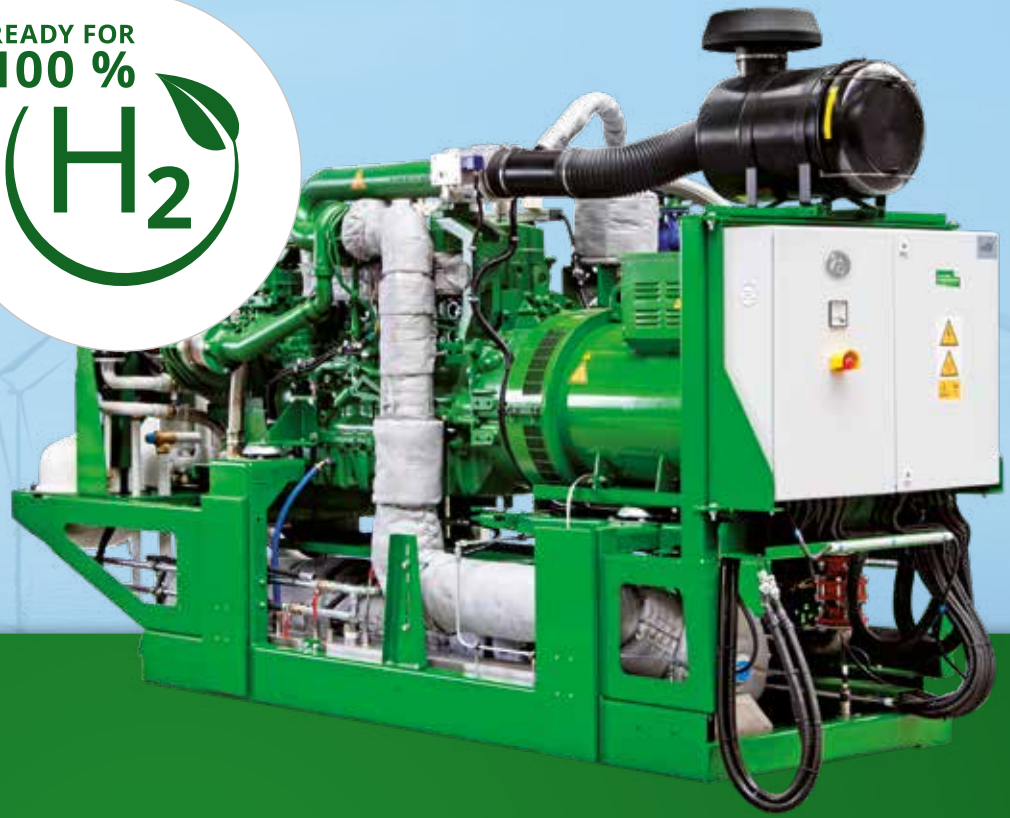
If required, you can have your CHP converted to run on H_2 at any time.

agenitor. 80 to 450 kW.

Type	Configuration	Electrical output	Thermal output
		Natural gas	Natural gas
agenitor 404	bt80-1	100 kW	112 kW
	ct70-1	160 kW	172 kW
agenitor 406	ct70-1	250 kW	268 kW
	bt70-1	250 kW	304 kW
agenitor 408	ct70-1	360 kW	383 kW
	bt70-1	360 kW	440 kW
agenitor 412	ct70-1	450 kW	493 kW
	bt70-1	450 kW	609 kW
		Biogas	Biogas
agenitor 404	at135-0	80 kW	104 kW
	bt135-0	100 kW	110 kW
	ct135-0	160 kW	155 kW
agenitor 406	ct135-0	250 kW	245 kW
agenitor 408	ct135-0	360 kW	345 kW
agenitor 412	ct80-0	450 kW	468 kW

Efficiency levels, see p. 28-31. Installation options, see p. 22-23.

READY FOR 100 % H_2



agenitor H_2

Future technology for today.

The agenitor. Perfect for climate-neutral, electricity driven demand. Further areas of use, see p. 8/9.

Renewable hydrogen as a climate-neutral fuel for CHPs.

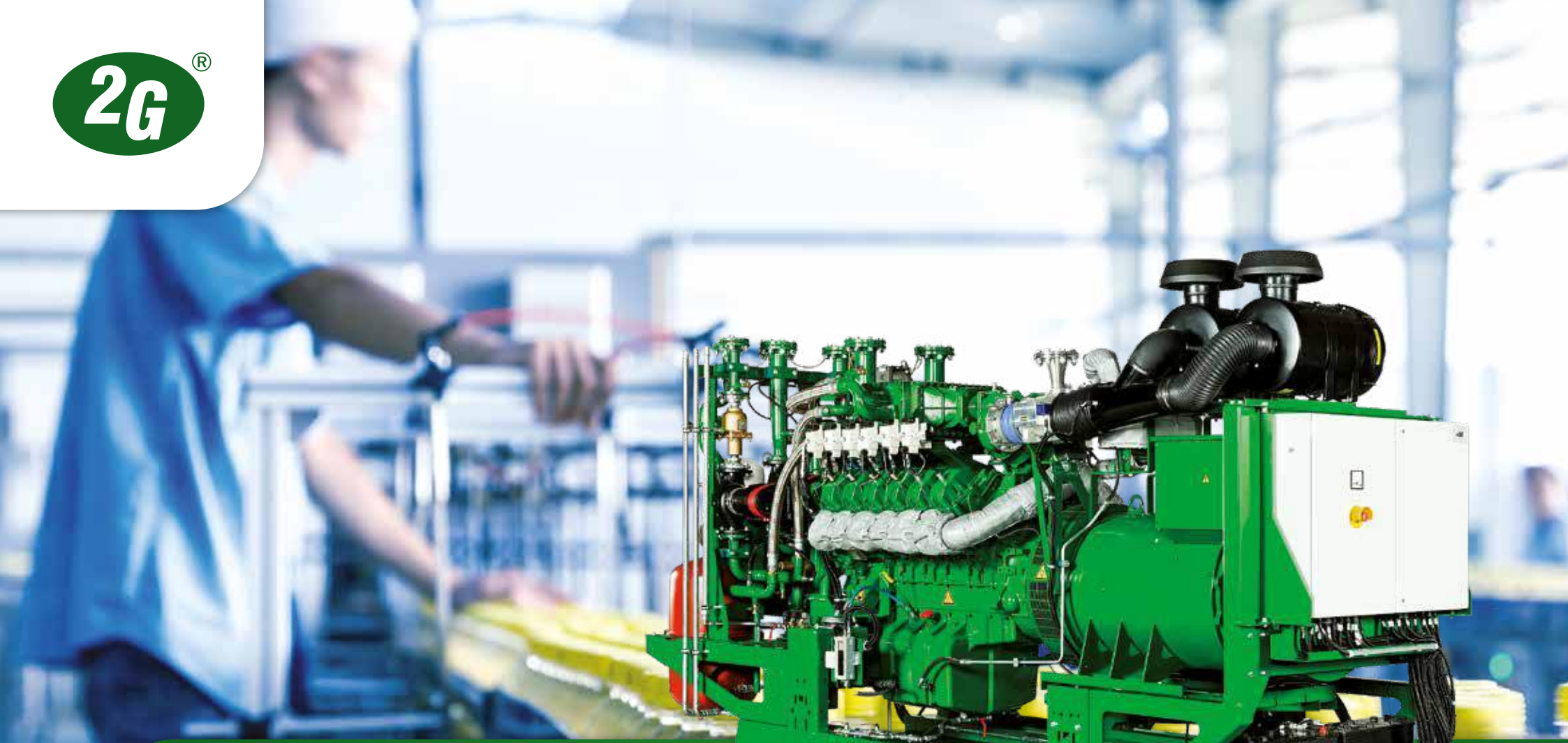
The use of hydrogen as an energy source is a milestone on the road to climate neutrality. H_2 forms the key technology that enables flexible, safe and time-delayed use of regeneratively generated energy on a large scale. In all important sectors.

With the agenitor H_2 series, 2G has succeeded in adapting a proven, highly efficient natural gas CHP so that it can use 100% hydrogen for the decentralised generation of electricity and heat with comparable economic efficiency and reliability.

agenitor H_2. 115 to 750 kW.

Type	Configuration	Electrical output	Thermal output
		Hydrogen	Hydrogen
agenitor 404 H_2	ct0-0	115 kW	129 kW
agenitor 406 H_2	ct0-0	170 kW	183 kW
agenitor 408 H_2	ct0-0	240 kW	250 kW
agenitor 412 H_2	ct0-0	360 kW	371 kW
agenitor 420 H_2	ct0-0	750 kW	747 kW

Installation options, see p. 22-23.



avus

Built for big tasks.

The avus. Perfect for industry and commerce. Further areas of use, see p. 8/9.

Built for big tasks.

The avus is a highly efficient 2G power plant for high electric power consumption which is used in larger industrial projects or for supplying heating networks. If necessary, experienced 2G technicians familiar with large engine technology will completely take over the planning and management of the overall project and will provide professional assistance in designing the peripheral components.

- Complete solutions for industry: project planning, design of all components, communication with all interfaces on site, piping installation, integration in container or existing building
- Efficient running mode and operating times due to excellent engine quality

* Higher output ranges on request.
Efficiency levels, see p. 28-31. Installation options, see p. 22-23.

avus. 550 to 4,500 kW.

Type	Configuration	Electrical output	Thermal output
		Natural gas	Natural gas
avus 500plus	ct70-1	550 kW	599 kW
	bt70-1	550 kW	734 kW
avus 1000plus	ct70-1	999 kW	1,071 kW
avus 800e	8V-L64-FNER	854 kW	921 kW
avus 800e	8V-L64-FNER	999 kW	1,051 kW
avus 1200e	12-L64-FNER	1,287 kW	1,392 kW
avus 1200e	12-L64-FNER	1,521 kW	1,608 kW
avus 1600e	16-L64 FNER	1,716 kW	1,855 kW
avus 1600e	16-L64 FNER	2,028 kW	2,146 kW
avus 2000e	20-L64-FNER	2,535 kW	2,701 kW
		Biogas	Biogas
avus 500a	D225	550 kW	557 kW
avus 500plus	ct135-0	550 kW	526 kW
avus 500b	D25-F	657 kW	709 kW
avus 800a	D25-F	851 kW	935 kW
avus 800b	B25-F	901 kW	913 kW
avus 1000a	D25-F	1,067 kW	1,179 kW
avus 1000b	B25-F	1,202 kW	1,214 kW
avus 1500b	B25-F	1,497 kW	1,515 kW

Compact Container

Sizes available (LWH)
6.00 m x 2.44 m x 2.90 m

Acoustic emissions*[2]
Standard: 65 dB (A)
Super silent: down to 55 dB (A)

Information
Easy installation due to complete pre-assembly in the factory and compact design, integrated electrical installation

Container Basic

Sizes available (LWH)
7.00 m x 3.00 m x 3.00 m
9.60 m x 3.00 m x 3.00 m

Acoustic emissions*[2]
Standard: 65 dB (A)
Super silent: down to 52 dB (A)

Information
Made of sheet steel, lined internally with fleece and galvanized perforated sheet metal, integrated electrical installation

Container Heavy

Sizes available (LWH)
12.00 m x 3.00 m x 3.00 m
15.00 m x 3.00 m x 3.00 m

Acoustic emissions*[2]
Standard: 65 dB (A)
Super silent: down to 55 dB (A)

Information
Made of sheet steel, lined internally with fleece and galvanized perforated sheet metal, integrated electrical installation

Container Basic High Line

Sizes available (LWH)
9.00 m x 3.00 m x 3.70 m

Acoustic emissions*[2]
Standard: 52 dB (A)
Super silent: down to 45 dB (A)

Information
Like container basic, optimized design, cooler in addition to supply and return air ducts integrated in the container roof

Extremely versatile and quiet.

2G power plants can be installed in various ways – depending on local conditions and the requirements for sound insulation. They can therefore be incorporated in existing buildings or heating systems or can be set up separately in a container or engine room. With the appropriate sound insulation package, noise emission can be as low as 35 dB (A) at a distance of 10 m.

Basic Concrete Acoustic Enclosure

Sizes available (LWH)
11.00 m x 4.30 m x 3.70 m*
12.00 m x 4.30 m x 3.70 m
13.00 m x 4.30 m x 3.70 m

Acoustic emissions*[2]
Standard: 65 dB (A)
Super silent: down to
45 dB (A)

Information
Complete concrete enclosure of the 2G power plant, wall thickness 160 mm, integrated electrical installation, high mass to reduce the body noice

High Line Concrete Acoustic Enclosure

Sizes available (LWH)
9.60 m x 3.60 m x 3.75 m

Acoustic emissions*[2]
Standard: 65 dB (A)
Super silent: down to
35 dB (A)

Information
Like basic concrete acoustic enclosure, optimized design, cooler (size-depend-ent) in addition to supply and return air ducts integrated in the container roof, high mass to reduce the body noice

Sound Capsule

Sizes available (LWH)
depending on product

Acoustic emissions*[3]
Standard: 65 dB (A)

Information
Encapsulation of the entire 2G power plant using sheet steel cases, easily accessible through doors and maintenance flaps

Outdoor Sound Capsule

Sizes available (LWH)
depending on product

Acoustic emissions*[3]
Standard: 65 dB (A)

Information
Encapsulation of the entire 2G power plant, easily accessible through doors and maintenance flaps

* Also available in 35 db (A), in 10 m, free field conditions.
*[2] At a distance of 10 m free field conditions.
*[3] At a distance of 1 m free field conditions.

Heat Store

Chilled Water Production

High Temperature

Virtual Power Plant

Interconnective

Infinitely Adjustable Regulation

Waste gas treatment

Emergency Backup

Biogas Treatment

Innovative energy concepts.

Air-conditioning of offices, generating steam for industry and being at the forefront technology for stable decentralised energy supply of the future. All of this is what cogeneration generally does – especially a highly efficient power plant by 2G.

Storing heat.

By incorporating a heat store, it’s possible to decouple heat production from electricity production and to use the 2G power plant flexibly.

Cooling with heat.

The heat arising during cogeneration can be converted into chilled water by means of an absorption chiller and can be used, for example, for environmentally-compatible air conditioning.

Raising the temperature.

Incorporated in steam, hot water and thermal oil applications, 2G power plants can provide customized solutions for such as the food industry.

Treating waste gas.

By installing catalyst technology in a 2G power plant, it is possible to remove small amounts of pollutants that are still present in the exhaust gas and to achieve values below the limits of the current UK emissions requirements.

Biogas treatment.

After the natural fermentation process, biogas often still contains residues of undesirable substances, such as sulphur. The biogas is upgraded by using activated charcoal filters and gas cooling systems.

Operating as a backup in an emergency.

It is not always possible or practical to connect to a stable power grid. 2G power plants are capable of operating in isolated networks and may guarantee a backup supply in an emergency.

Regulating with continuous adjustment.

Unlike large power plants, CHP plants can regulate their output within a very short time. 2G power plants are infinitely adjustable in the power range between 50 and 100 percent and adjust to the actual energy demand with the help of modern control technology.

Virtual power plant.

2G power plants are equipped with a special interface enabling them to be integrated easily in virtual power plants and also enabling them to participate in the energy market.

2G service. Efficient and fast.

2G offers a leading edge service concept so that every 2G power plant runs permanently and with maximum efficiency. Service is supported by the 2G Power Plant System for automated remote diagnosis, control and maintenance.

2G Power Plant.
Automated remote diagnosis.

2G has expanded servicing via remote access to the plant control system by adding an innovative module: 2G Power Plant. The key to this concept is automated remote diagnosis of all the plant parameters. If a technical disruption is looming in a 2G power plant, it is automatically reported online to the 2G service centre without delay. This is carried out without the operator needing to take any action. With the relevant system parameters, the system also reports a suggested solution. An employee in the 2G service centre initiates the appropriate measures immediately to ensure that the plant continues to operate. Fast and efficient!

Premium service contract.
Complete cost control.

Every operator of a 2G power plant is well protected with a premium service contract. No additional costs arise as a result of maintenance and repair work (including all spare and wear parts). As a result, the operator retains full cost control.

2G service team.
On site worldwide.

A worldwide service network and a comprehensive spare parts warehouse form the basis for a professional on site maintenance and repair service. Hundreds of 2G service vehicles and a large number of specially trained service partners operate across the world.

2G. Product overview – natural gas.

g-box
20 - 50 kW

aura
100 - 420 kW

patruus
140 - 260 kW

agenitor
95 - 450 kW

Type	Configuration	Output		Efficiency		
		electrical	thermal	electrical	thermal	total
g-box 20	as22-4	20 kW	44 kW	32.0%	70.4%	102.4%
g-box 50plus	as70-4	50 kW	104 kW	34.5%	71.8%	106.3%
aura 404	bt70-4	100 kW	176 kW	36.7%	64.7%	101.4%
aura 406	bt70-1	170 kW	260 kW	37.3%	65.9%	103.2%
aura 408	bt70-1	280 kW	408 kW	38.4%	55.9%	94.3%
aura 412	bt70-1	420 kW	611 kW	38.5%	56.0%	94.5%
patruus 140	as80-1	140 kW	207 kW	36.5%	53.9%	90.4%
patruus 263	as80-1	263 kW	380 kW	38.0%	54.9%	92.9%
agenitor 404	bt80-1	100 kW	112 kW	38.4%	42.9%	81.3%
	ct70-1	160 kW	172 kW	40.5%	43.5%	84.0%
agenitor 406	ct70-1	250 kW	268 kW	41.3%	44.2%	85.5%
	bt70-1	250 kW	304 kW	39.7 %	48.3 %	88.0 %
agenitor 408	ct70-1	360 kW	383 kW	41.6%	44.2%	85.8%
	bt70-1	360 kW	440 kW	39.7%	48.5%	88.2%
agenitor 412	ct70-1	450 kW	493 kW	41.3%	45.3%	86.6%
	bt70-1	450 kW	609 kW	39.0%	52.8%	91.8%

2G. Product overview – natural gas.

Type	Configuration	Output		Efficiency		
		electrical	thermal	electrical	thermal	total
avus 500plus	ct70-1	550 kW	599 kW	40.3 kW	43.9 kW	84.2 kW
	bt70-1	550 kW	734 kW	38.5 kW	51.4 kW	89.9 kW
avus 1000plus	ct70-1	999 kW	1,071 kW	40.9 kW	43.8 kW	84.7 kW
avus 800e	8V-L64-FNER	854 kW	921 kW	42.4 kW	45.7 kW	88.1 kW
avus 800e	8V-L64-FNER	999 kW	1,051 kW	42.9 kW	45.2 kW	88.1 kW
avus 1200e	12-L64-FNER	1,287 kW	1,392 kW	42.2 kW	45.7 kW	87.9 kW
avus 1200e	12-L64-FNER	1,521 kW	1,608 kW	42.8 kW	45.2 kW	88.0 kW
avus 1600e	16-L64 FNER	1,716 kW	1,855 kW	42.3 kW	45.8 kW	88.1 kW
avus 1600e	16-L64 FNER	2,028 kW	2,146 kW	42.7 kW	41.7 kW	84.4 kW
avus 2000e	20-L64-FNER	2,535 kW	2,701 kW	42.6 kW	45.3 kW	87.9 kW

avus
550 - 4,500 kW*

* Higher output ranges on request.

2G. Product overview – hydrogen.

Type	Configuration	Electrical output	Thermal output
		Hydrogen	Hydrogen
agenitor 404 H_2	ct0-0	115 kW	129 kW
agenitor 406 H_2	ct0-0	170 kW	183 kW
agenitor 408 H_2	ct0-0	240 kW	250 kW
agenitor 412 H_2	ct0-0	360 kW	371 kW
agenitor 420 H_2	ct0-0	750 kW	747 kW

2G. Product overview – biogas.

agenitor
80 - 450 kW

Type	Configuration	Output		Efficiency		
		electrical	thermal	electrical	thermal	total
agenitor 404	at135-0	80 kW	104 kW	37.3%	48.6%	85.9%
	bt135-0	100 kW	110 kW	38.6%	42.4%	81.0%
	ct135-0	160 kW	155 kW	41.5%	40.2%	81.7%
agenitor 406	ct135-0	250 kW	245 kW	42.4%	41.6%	84.0%
agenitor 408	ct135-0	360 kW	345 kW	42.5%	40.7%	83.2%
agenitor 412	ct80-0	450 kW	468 kW	41.1%	42.7%	83.8%

2G. Product overview – biogas.

Type	Configuration	Output		Efficiency		
		electrical	thermal	electrical	thermal	total
avus 500a	D225	550 kW	557 kW	42.1%	42.6%	84.7%
avus 500plus	ct135-0	550 kW	526 kW	42.5%	40.7%	83.2%
avus 500b	D25-F	657 kW	709 kW	40.5%	45.1%	85.6%
avus 800a	D25-F	851 kW	935 kW	40.7%	44.7%	85.4%
avus 800b	B25-F	901 kW	913 kW	42.3%	42.8%	85.1%
avus 1000a	D25 - F	1,067 kW	1,179 kW	40.9%	45.2%	86.1%
avus 1000b	B25-F	1,202 kW	1,214 kW	42.4%	42.8%	85.2%
avus 1500b	B25-F	1,497 kW	1,515 kW	42.3%	42.8%	85.1%

avus
550 - 4,500 kW*

* Higher output ranges on request.

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