

A child with curly hair, seen from behind, wearing a red knitted sweater, stands in a lush green field with yellow wildflowers. The child's arms are raised in a 'V' shape towards a cloudy sky. The background shows rolling green hills and a distant city skyline.

We Care for a Better Future.



2G. Company Presentation.

Global gas engine manufacturer & solution Provider

2G. Cogeneration.

17.03.2021

2G Energy AG

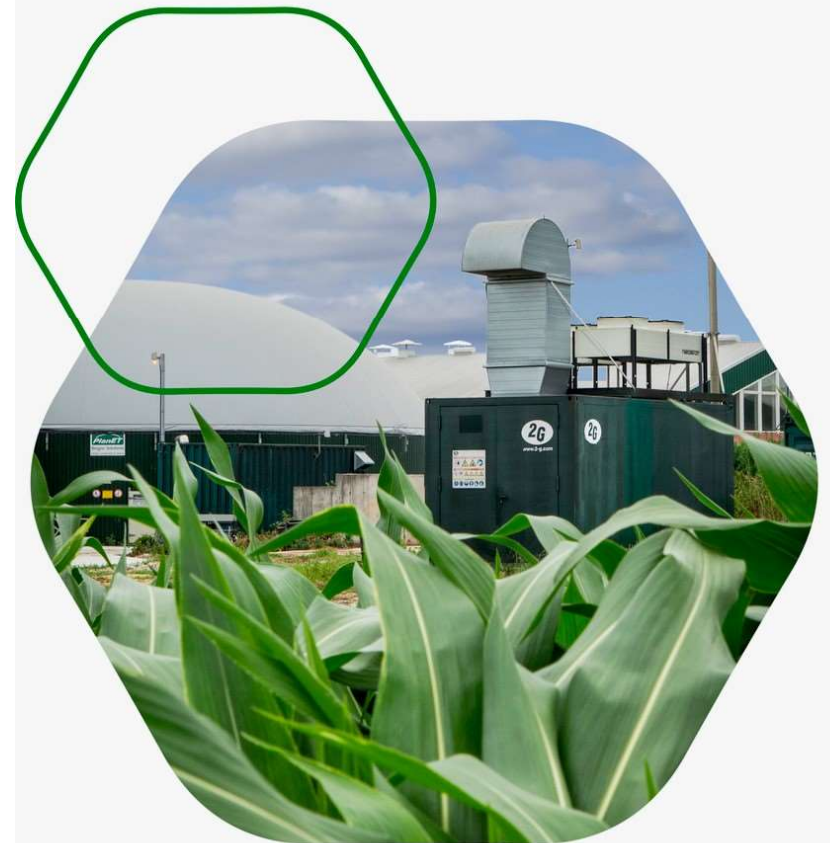
Heek,
Germany



STEPMAP

Introduction

- Founded 1995 - Headquarters in Heek in the Northwest of Germany
- Gas engine solution provider for the whole life-cycle, including design, engineering and after sales services
- Plants for biogas and natural gas applications from 20 – 4,000 kW electrical power
- 10 national and international subsidiaries
- 650+ employees, public listed since 2007
- 6,500 plants in more than 50 countries worldwide





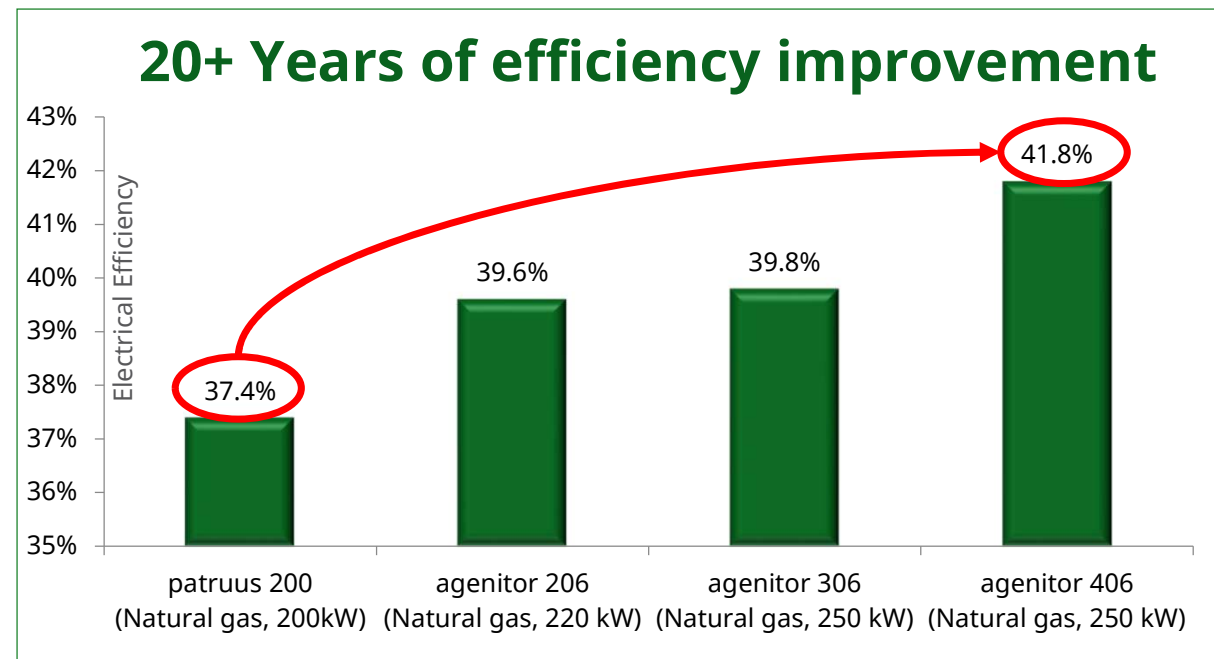
2G's Core competence as gas engine manufacturer

2G Energy is a gas engine manufacturer with state-of-the-art manufacturing facilities and its own R&D division, specialized in Containerized solutions for global power markets.

100% dedicated to

- manufacturer of own-built engines from 20kW to 550KW
- Natural Gas, Biogas, Propane, Flare and Hydrogen gases
- Modular Genset & CHP Power Systems

Technology leader in gas engines under 550KWel and for operation on pure Hydrogen gas with multiple plants in commercial operation...





Todays stock snapshot.

2G Energy AG (2GB.DE)

XETRA - XETRA Delayed Price. Currency in EUR

☆ Add to watchlist

94.50 +0.90 (+0.96%)

At close: 5:36PM CET

[Summary](#) [Chart](#) [Conversations](#) [Statistics](#) [Historical Data](#) [Profile](#) [Financials](#) [Analysis](#) [Options](#) [Holders](#) [Sustainability](#)

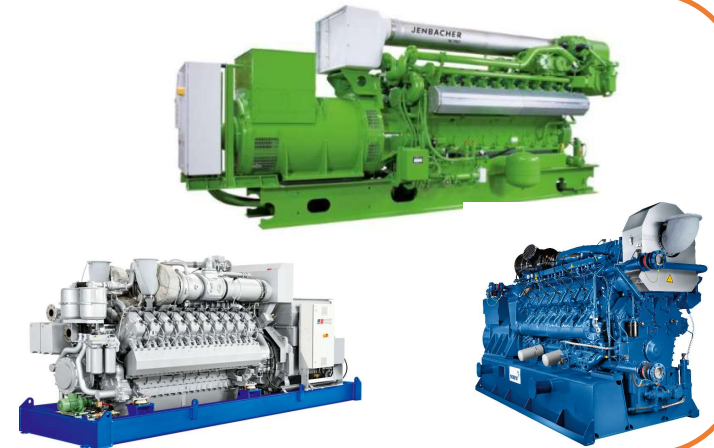
Previous Close	93.60	Market Cap	418.635M
Open	93.90	Beta (5Y Monthly)	1.60
Bid	94.80 x 10000	PE Ratio (TTM)	40.89
Ask	94.80 x 42600	EPS (TTM)	2.31
Day's Range	92.40 - 95.00	Earnings Date	Nov 15, 2020
52 Week Range	29.50 - 106.20	Forward Dividend & Yield	0.45 (0.48%)
Volume	20,348	Ex-Dividend Date	Jun 23, 2020
Avg. Volume	11,623	1y Target Est	N/A



(Yahoo Finance on 18.2.2021)

Product line up

Product Group	Power Range	Type of fuel
g-box	20 to 50 kW	Natural Gas / LPG
aura	100 to 360 kW	Natural Gas
agenitor	100 to 450kW	Natural Gas / Biogas / H2 / LPG
avus	500 to 4.000 kW	Natural Gas / Biogas





OEM Partnership with Jenbacher/INNIO :

Key Facts:

- near 1000 Engines Installed Globally
- 130 Jenbacher Engines Each Year (leading Jenbacher System Integrator)
- **worldwide authorization** for
 - sales of genset & integrated solutions
 - life-cycle service, warranty, commissioning





OEM Alliance with MTU/RollsRoyce & MWM/CAT.

Key Facts:

- long term system integration of MWM/CAT
- Reciprocal supply agreement among MTU and 2G
- **worldwide authorizations** for
 - sales of genset & integrated solutions
 - life-cycle service, warranty, commissioning



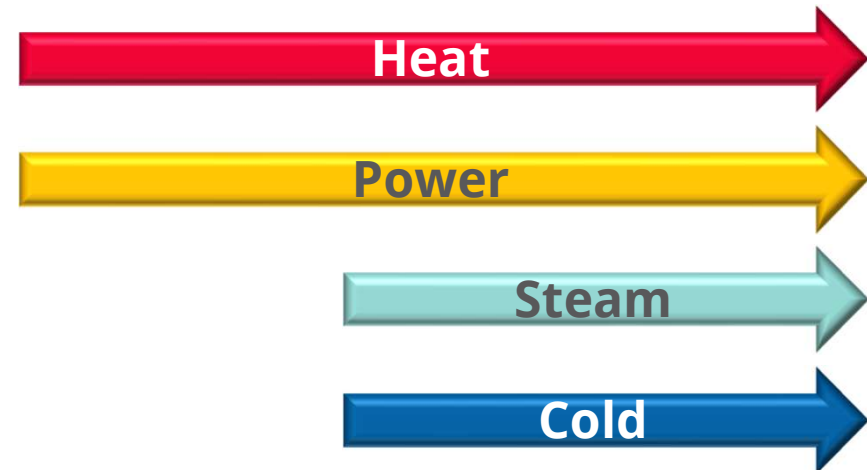
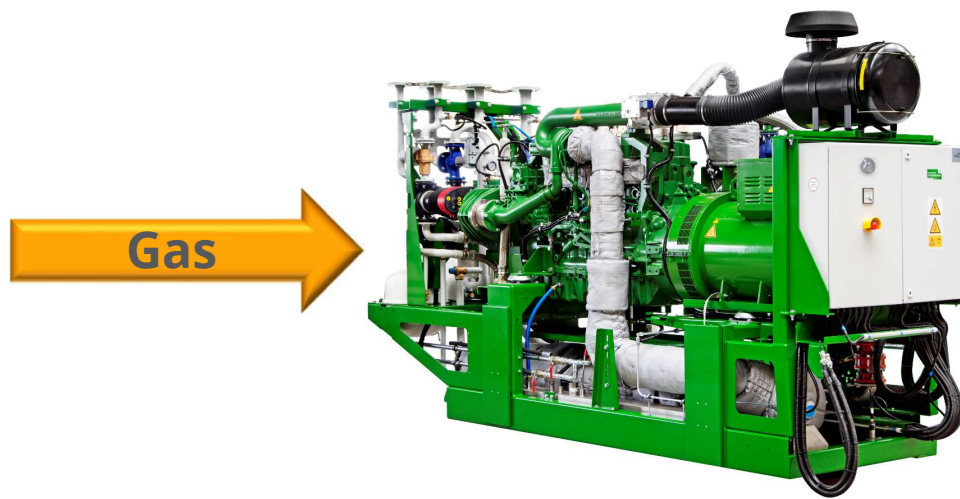


2G. Product overview – natural gas (550 to 4000 kW)

avus
550 - 3.400 kW*

Typ	Konfiguration	Leistung		Wirkungsgrad		
		elektrisch	thermisch	elektrisch	thermisch	gesamt
avus 500 plus	ct80-1	550 kW	578 kW	42,6 %	44,7 %	87,3 %
	ct70-1	550 kW	590 kW	41,7 %	44,7 %	86,4 %
	bt70-1	550 kW	723 kW	39,8 %	52,3 %	92,1 %
avus 500c	-	600 kW	652 kW	42,1 %	45,7 %	87,8 %
avus 500a	D209-F	600 kW	685 kW	41,3 %	47,1 %	88,4 %
avus 500b	D05-F	637 kW	739 kW	40,9 %	47,4 %	88,3 %
avus 800c	-	800 kW	861 kW	42,4 %	45,6 %	88,0 %
avus 800b	C05-F	934 kW	979 kW	43,1 %	45,2 %	88,3 %
avus 800a	D05-F	851 kW	991 kW	40,7 %	47,4 %	88,1 %
avus 1000a	D05-F	1.067 kW	1.241 kW	40,9 %	47,6 %	88,5 %
avus 1000c	-	1.200 kW	1.244 kW	42,6 %	44,1 %	86,7 %
avus 1000b	C05-F	1.248 kW	1.306 kW	43,2 %	45,3 %	88,5 %
avus 1500b	C05-F	1.558 kW	1.645 kW	43,0 %	45,4 %	88,4 %
avus 1500c	-	1.560 kW	1.650 kW	42,2 %	44,6 %	86,8 %
avus 1600e	L64 FNER	2025 kW	2055 kW	44,3 %	44,8 %	89,1 %
avus 2000a	J01-G	1999 kW	1930 kW	44,9 %	43,3 %	88,2 %
avus 2000c	-	2000 kW	2065 kW	42,6 %	44,0 %	86,6 %
avus 2000e	L64 FNER	2145 kW	2082 kW	43,6 %	44,4 %	86,0 %
avus 2000d	L33 FN	1999 kW	2109 kW	42,8 %	45,2 %	88,0 %
avus 2000b	J01-G	2676 kW	2527 kW	45,5 %	42,9 %	88,4 %
avus 3000a	J11-G	3360 kW	3172 kW	45,6 %	43,0 %	88,6 %

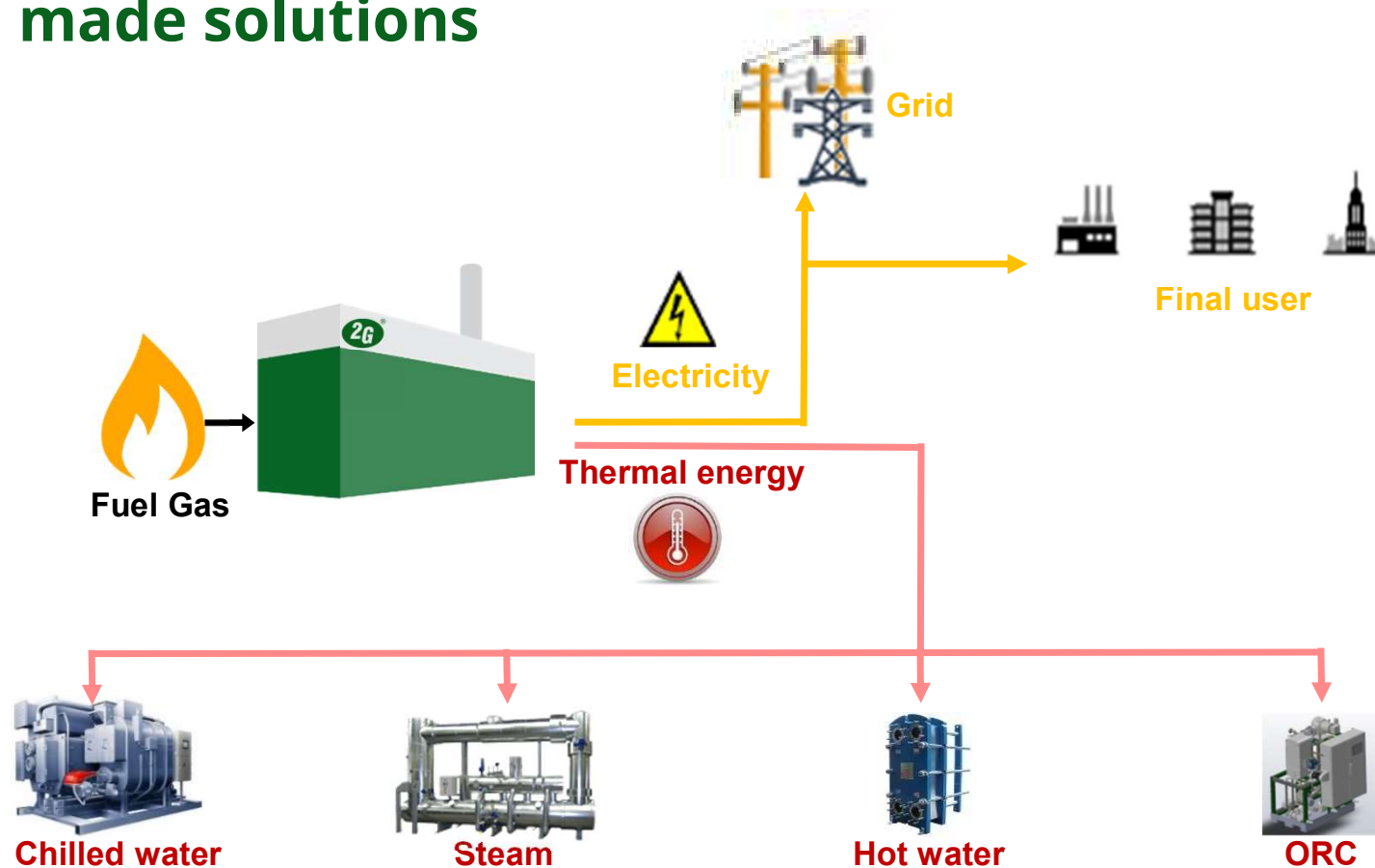
Solutions for Combined Heat and Power Plant (CHP).



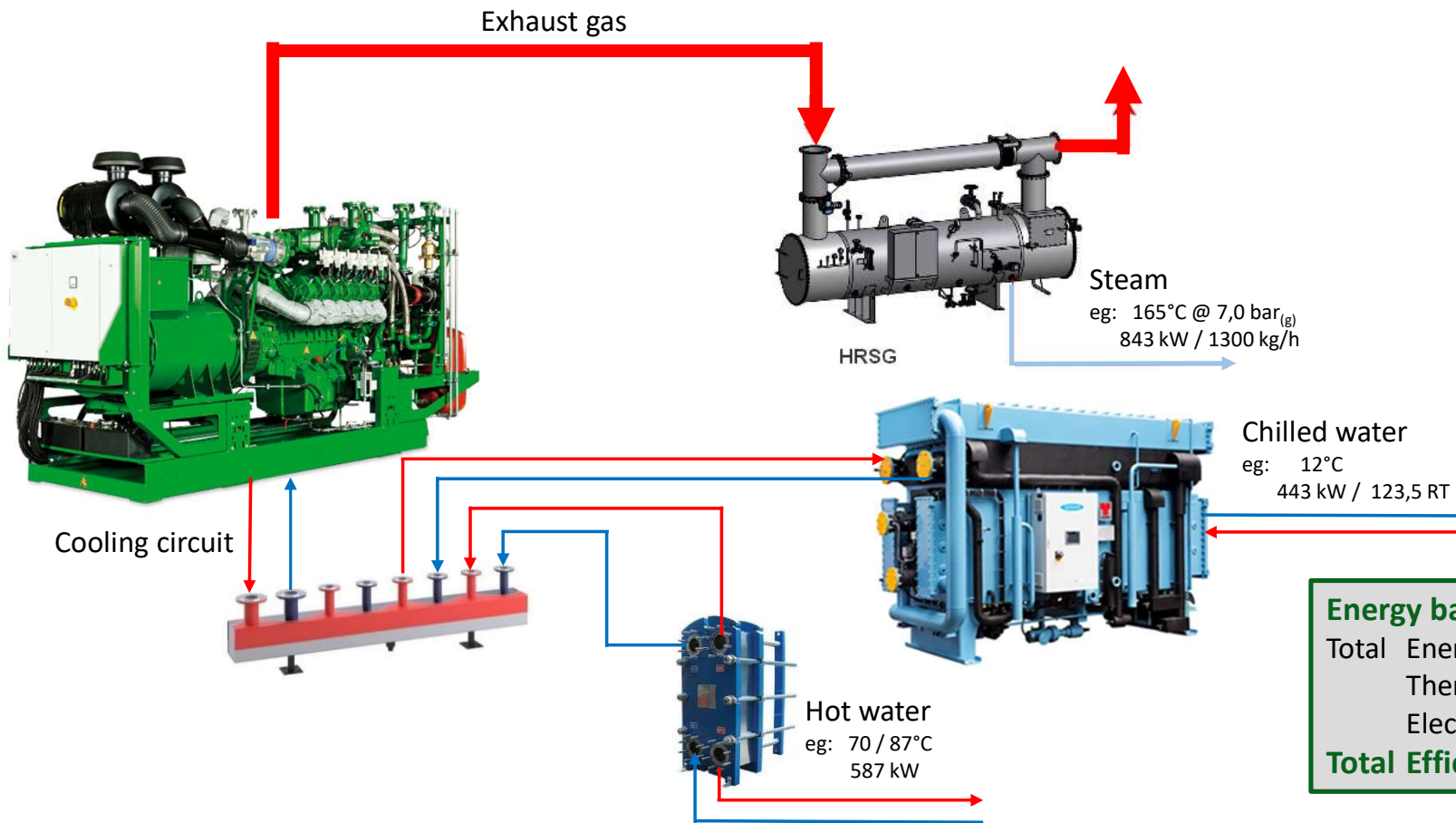
Technical advantages CHP:

- The heat of the combustion process can be used (more than 90% total efficiency)
- Decentral and highly flexible
- Reliable System (Security of Supply)

Custom made solutions



Custom made solutions – Cooling, Steam & Hot Water



Energy balance (Avus 1600e):

Total Energy Input:	4.646 kW
Thermal power:	1.873 kW
Electrical power:	2.014 kW
Total Efficiency:	83,66 %



Customer tailored solutions – application example dairy.



Cold

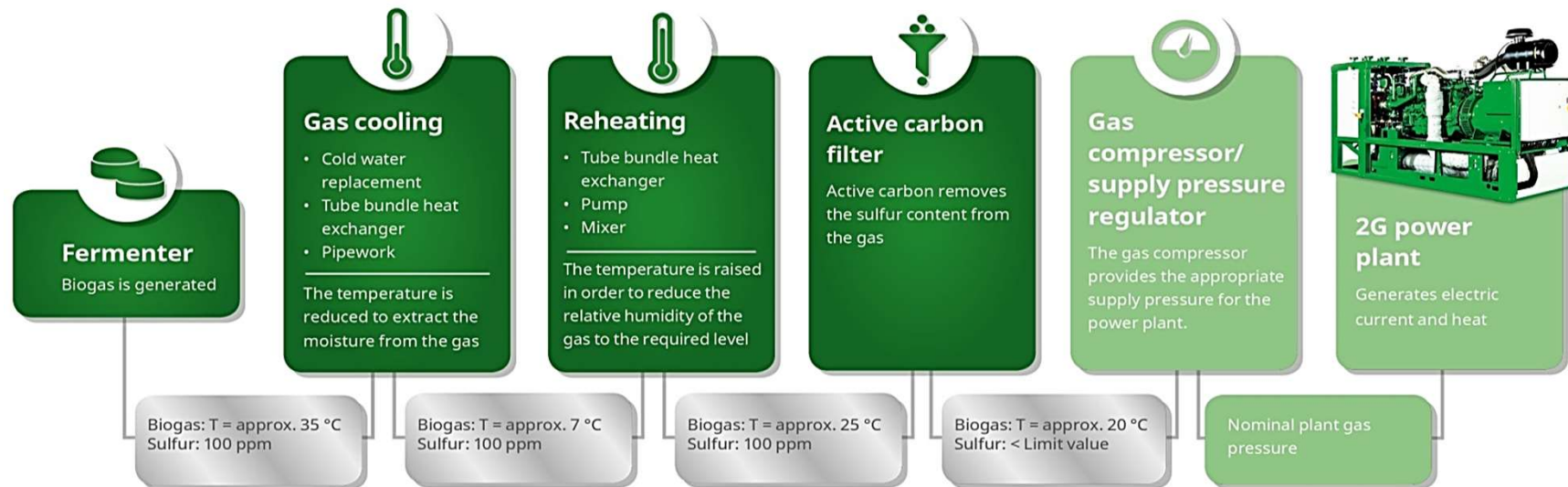
Heat

Steam

Electricity

Biogas Cleaning.

Biogas typically has 100% moisture saturation and contains harmful pollutants like hydrogen sulfide. 2G provides a solution for optimized biogas purity to extend the engine reliability and life.



Specialized in container solutions.



G2P Solutions global markets

Compact Design

L = 11.500mm
W = 2.438mm
H = 3.200mm



„Hot' climate
eg. Mexico



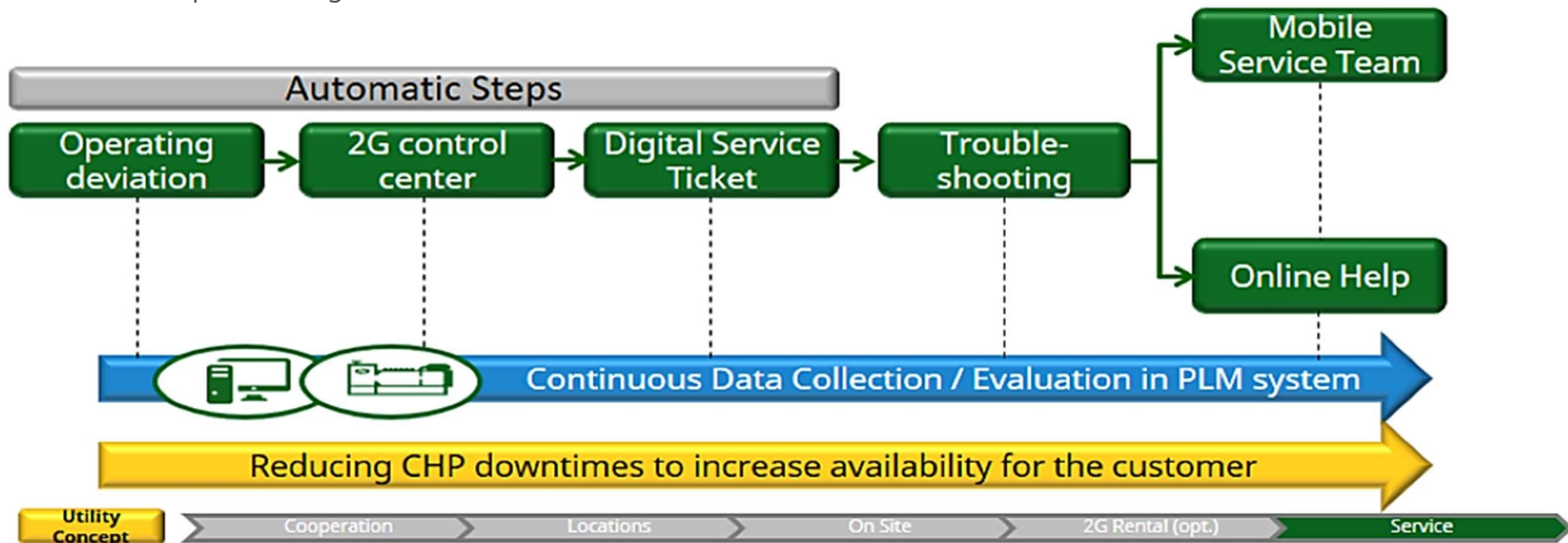
„Cold' climate
eg. Europe





I.R.I.S. associated with my.2-g.com.

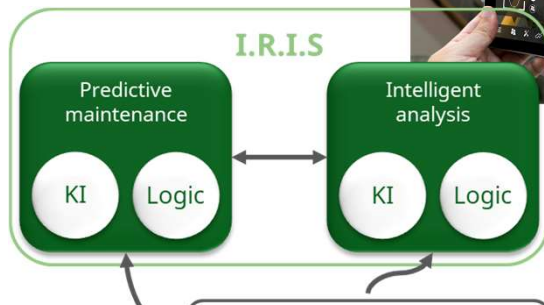
I.R.I.S stands for Intelligent Responsive Information System and ensures automatic prophylactic provisions in order to prevent engines disturbances.



Service offering.

Augmented Reality.

- By using AR technology technicians will be helped to inspect engine parts
- By voice transmission, instructions will be translated directly into customers language



Support
24hr

2G Service offering.

- Comprehensive Service.
- Outstanding engine expertise.
- Original OEM replacement parts.
- Global Service Presence



my.2-g.com

Die Toolbox für eine effiziente Partnerschaft mit 2G.



17.03.2021

2G. Cogeneration.

References

References Globally.



SIEMENS



steag



17.03.2021

2G. Cogeneration.

18



Atizapan Landfill.

Field of application: Landfill site
Country: Mexico
Location: Atizapan
Engine type: 1 x avus 1000c
Gas type: Landfill gas
Electrical capacity: 2 x 1200 kW
Installation: Container



17.03.2021

Victor Valley Wastewater.

Field of application: Wastewater
Country: USA
Location: Victor Valley, CA
Engine type: avus 800c
Gas type: Sewage gas
Electrical capacity: 1,600 kW
Thermal power: 1,680 kW
Installation: Container



2G. Kraft-Wärme-Kopplung.

2G Solution advantages:

- Plug and play
- Ideal for cold and warm weather
- Runs in cascade as well
- Biogas treatment systems
- Exhaust gas treatment
- Best reliability on market
- Highest efficiencies



Hondupalma Biogas.

Field of application: Food industry

Country: Honduras

Location: El Nigrito

CHP type: avus 1000c

Gas type: Biogas

Electrical capacity: 1,200 kW

Thermal power: 1,238 kW

Installation: Container

Further information: The avus 1000c is fired by the biogas recovered by recycling waste from palm oil production and provides green electricity to the site in Central America.





H. & E. Reinert Westfälische Privat-Fleischerei GmbH.

Field of application: Food industry
Country: Germany
Location: Versmold
CHP type: avus 1500b
Gas type: Natural gas
Electrical capacity: 1,487 kW
Thermal power: 1,484 kW
Installation: 2x Container



Further information: Supplying the production of processed meats with sufficient heat, electricity and steam, the 2G was coupled with a steam generator that produces 730 kg per hour.



Stadtwerke Witten / Germany

Fuel Type: Biogas Size: 6 x 250 Kw
Application: Heating network



Limbazu novads / Latvia

Fuel Type: Biogas Size: 5 x 400 Kw
Application: Heating network



Key facts - Japan

- First plant installation in Japan: 2004
- Up to now: ~200 CHP sold (majority with Biogas)
- Strong increase in demand since July 2012 (39 yen/kWh of FIT)
- 2G covers Japanese market with 3 Sales & Service partners located on Hokkaido and Honshu since +10 years
- 24/7 Remote access (Maintenance) for the Japanese plants from Service Center in Germany
- Education department of 2G ensures highly educated service personnel (on-site trainings in Japan as well as training sessions at head office in Germany)



References – Medium Voltage (6.6kV) application

- Biogas plant with 2000kWel capacity (2x 1000kWel CHP installed)
- Location: Asakura district, Fukuoka prefecture



Development of turn over and EBIT in Mio. Euro.

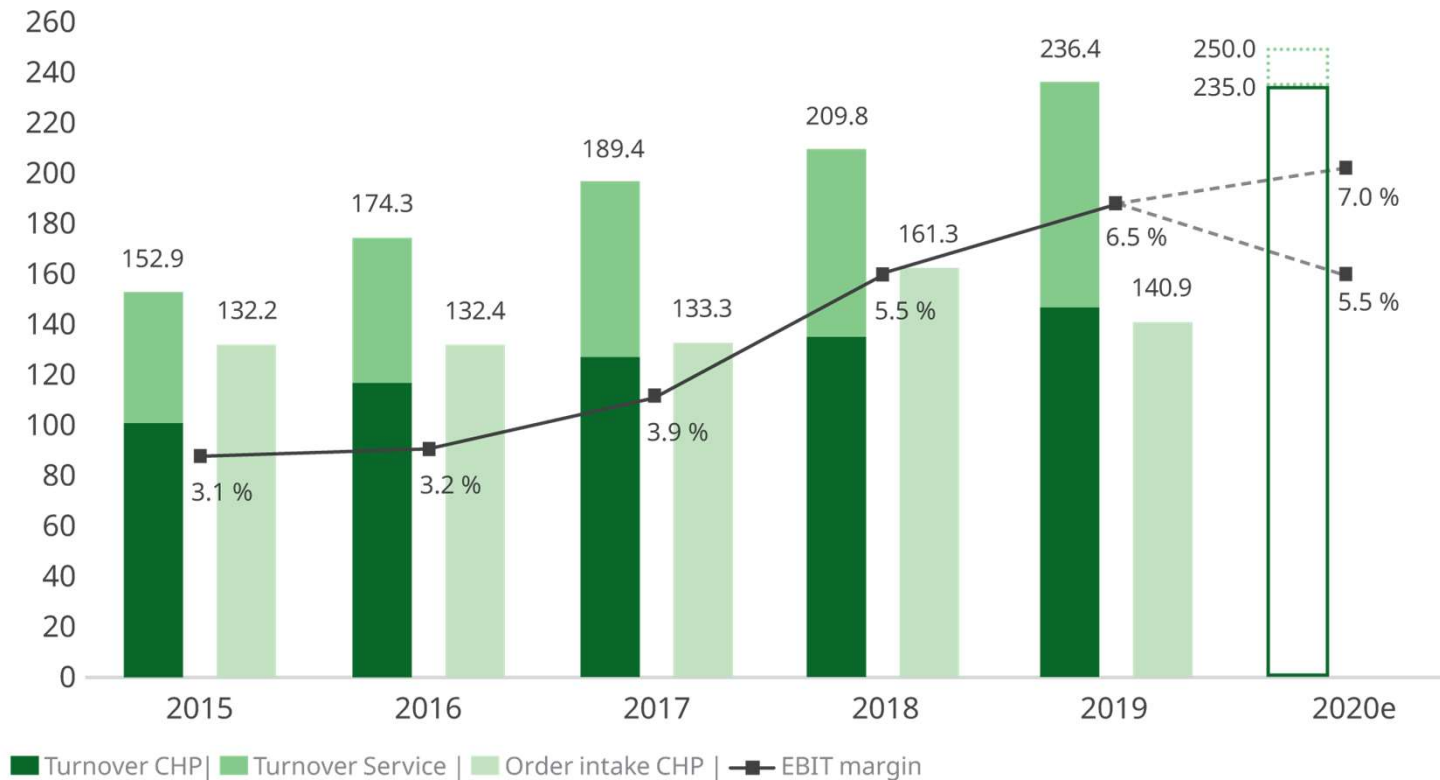
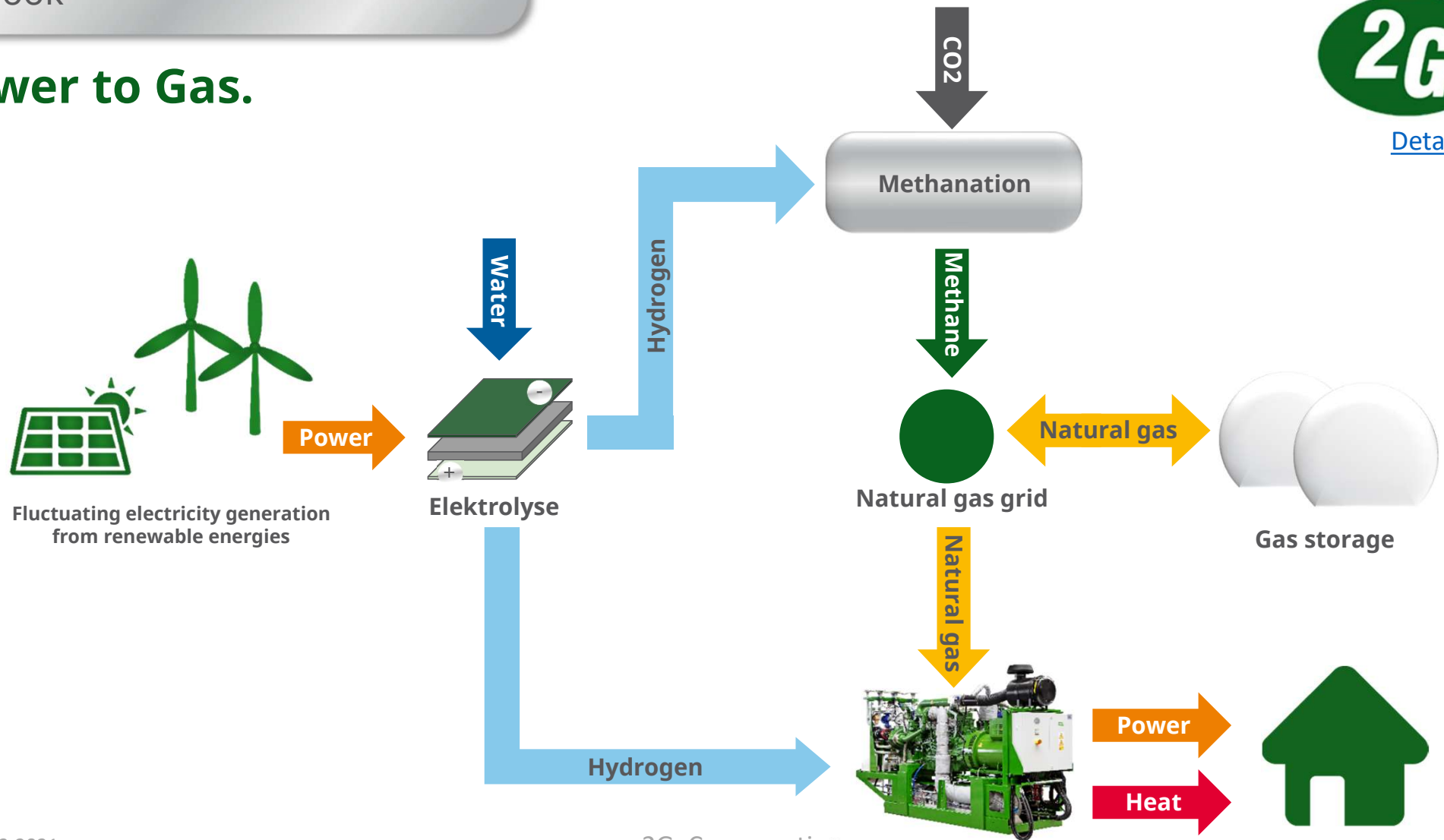


Diagram 9: Trends in sales, order intake and EBIT margin of 2G Energy AG 2015–2019 and the 2020 forecast.

Power to Gas.



[Details](#)

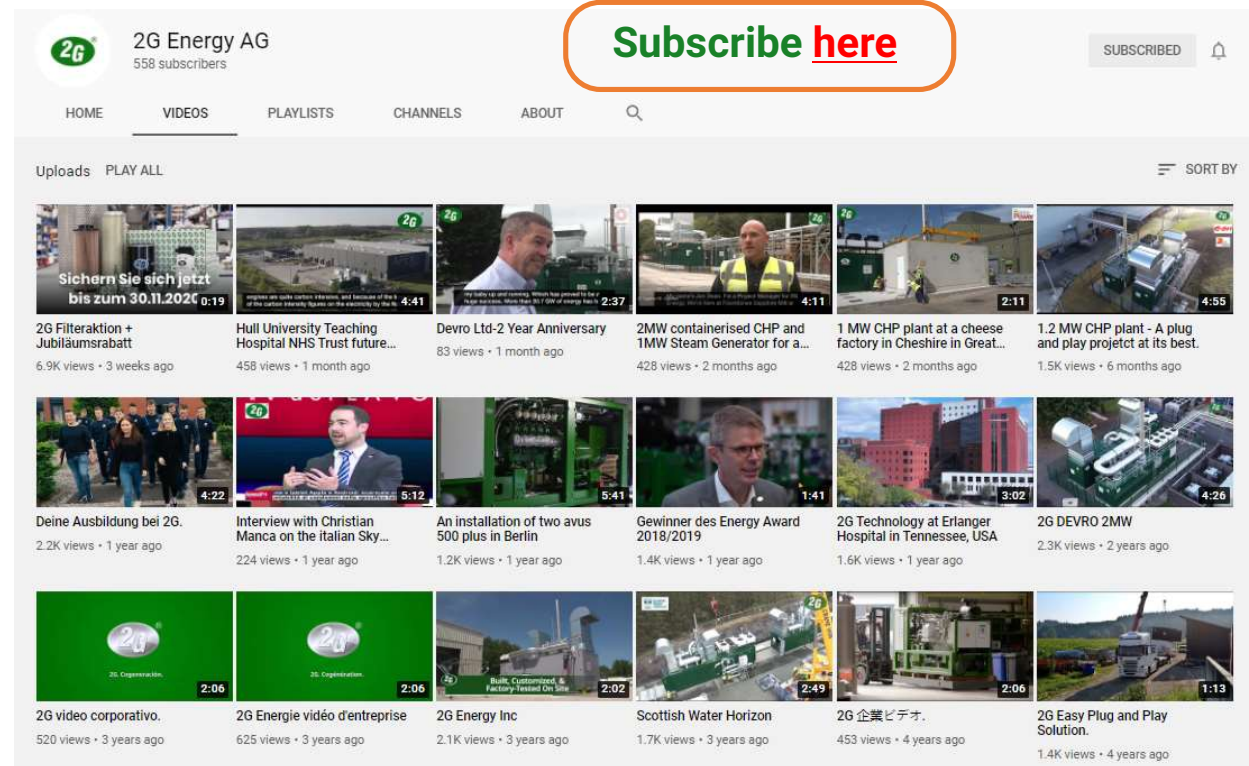


References

Reference Videos.



- **2G Energy Company Video**
<https://www.youtu.be/0s7HljFF3Ec>
- **5 MW at sugar manufacturer in Great Britain**
<https://www.youtube.com/watch?v=rnDfD9qnIt8>
- **Scottish Water Horizon**
https://www.youtube.com/watch?v=8_wQPIZDbhg
- **2G DEVRO 2MW**
<https://www.youtube.com/watch?v=Ik84OPqZAnM>
- **1.2 MW CHP plant - plug and play**
https://www.youtube.com/watch?v=5MRuG32ZH_A
- **2G Easy Plug and Play Solution.**
<https://www.youtu.be/PZsCTmfVYIk>





Thank you very much for your attention!

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2G. Product overview – Bio gas (75 to 3000 kW)

	Type	Configuration	Output		Efficiency		
			electrical	thermal	electrical	thermal	total
patruus 50 - 64 kW	patruus 50	ct80-0	50 kW	70 kW	35.4 %	49.8 %	85.2 %
	patruus 64	ct80-0	64 kW	85 kW	36.3 %	48.1 %	84.4 %
agenitor 80 - 450 kW		at135-0	80 kW	107 kW	38.0 %	43.0 %	81.0 %
	agenitor 404	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	42.5 %	41.6 %	84.1 %
	agenitor 408	ct135-0	360 kW	345 kW	42.5 %	40.7 %	83.2 %
	agenitor 412	ct135-0	450 kW	468 kW	41.1 %	42.7 %	83.8 %
avus 550 - 2,000 kW*	avus 500a	D225-F	550 kW	567 kW	41.6 %	42.9 %	84.5 %
	avus 500 plus	ct135-0	550 kW	526 kW	42.5 %	40.6 %	83.1 %
	avus 500c	-	600 kW	598 kW	42.1 %	42.0 %	84.1 %
	avus 500b	D25-F	637 kW	702 kW	40.5 %	44.7 %	85.2 %
	avus 800c	-	800 kW	788 kW	42.4 %	41.8 %	84.2 %
	avus 800a	D25-F	851 kW	921 kW	40.7 %	44.0 %	84.7 %
	avus 800b	B25-F	901 kW	904 kW	42.3 %	42.4 %	84.7 %
	avus 1000a	D25 - F	1,067 kW	1,165 kW	40.9 %	44.7 %	85.6 %
	avus 1000c	-	1,200 kW	1,178 kW	42.5 %	41.7 %	84.2 %
	avus 1000b	B25-F	1,203 kW	1,201 kW	42.5 %	42.4 %	84.9 %
	avus 1500b	B25-F	1,501 kW	1,500 kW	42.4 %	42.4 %	84.8 %
	avus 1500c	-	1,560 kW	1,564 kW	42.0 %	42.1 %	84.1 %

Plant manager



G4574 - avus 500 plus
CHP avus 500plus biogas - Rivalea I
OperationModeOff: 2020-09-04 08:00

General

Current messages ***

- M0080: Maintenance switch active
 - Error source: -132S5
 - Reason: The maintenance switch (key switch) on the power unit control panel has been tripped.
 - Solution: - Tripping the maintenance switch prevents the accidental, automatic remote starting of the module. The key should be removed. Once the work has been completed, it may only be switched back on by the person who turned the switch off!
- M0225: Engine cooling water pressure minimum
 - Error source: -373B3
 - Reason: The engine coolant pressure is below the minimum warning threshold.
 - Solution: - Check engine cooling circuit (engine, exhaust gas heat exchanger, dump cooler, plate heat

Appointments

Tickets

2G Message

Emissions

Internal

G4951 - avus 500 plus
CHP avus 500plus biogas - Rivalea II
Warning: 2020-09-04 08:01

General

Current messages ***

- M0227: Engine cooling water pressure maximum
 - Error source: -373B3
 - Reason: The engine coolant pressure is above the upper warning threshold.
 - Solution: - Have an installer check the expansion vessel for sufficient primary pressure (= half operating pressure) and top it up if necessary:- Aspirate coolant circuit at highest points (dump cooler, mixture cooler for engine [V8 and V12 engines only]), "high points" in dump cooler supply line, etc.)- Discharge coolant:- If the problem persists, inform 2G Service or service part-ner.
- M0563: Grid-parallel remote controlled
 - Error source: x
 - Reason: The power is regulated via external prompt.

Appointments

Tickets

2G Message

Emissions

Internal

G5085 - avus 500 plus
CHP avus 500plus biogas - Rivalea III
Operation: 2020-09-04 08:01

General

Current messages ***

- M0563: Grid-parallel remote controlled
 - Error source: x
 - Reason: The power is regulated via external prompt.
 - Solution: Operator can change the settings using "Menu" - "Ext. prompt" However, the exact specification of the power is made by the central control technology/process control via field bus or hardware wiring (analogue signal).

Appointments

Tickets

2G Message

Emissions

Internal



Culver Duck Farms, Indiana

Fuel Type: Biogas Size: 3 x 400 Kw
Application: Farm



City of San Luis Obispo, California

Fuel Type: Biogas Size: 1 x 150 Kw
Application: Wastewater Treatment Plant





Howla Hay Farm, Guisborough / UK

Fuel Type: Biogas Size: 1 x 250 Kw
Application: Farm



Jeju Biogas / South Korea

Fuel Type: Biogas Size: 2 x 250 Kw
Application: Biowaste





Yuengling Brewery, Pennsylvania / US

Fuel Type: Biogas Size: 1 x 400 Kw
Application: Food industry



Kraft Foods, Banbury / UK

Fuel Type: Biogas Size: 1 x 250 Kw
Application: Food industry





Nolli, Mirabello Ciria / Italy

Fuel Type: Biogas Size: 1 x 98 Kw
Application: cow farm



MAIEZ Srl, Revello / Italy

Fuel Type: Biogas Size: 1 x 100 Kw
Application: Farm





Uikala Prügila, Kukruse / Estonia

Fuel Type: Landfill gas Size: 2 x 150 Kw
Application: Landfill



Verrières-en-Forez Biogas / France

Fuel Type: Biogas Size: 1 x 150 Kw
Application: Farm





Sakha Biogas.

Field of application:	Waste Water Treatment
Country:	Egypt
Location:	Sakha, Kafr El Sheik
CHP type:	avus 500 plus
Gas type:	Sewage gas
Electrical capacity:	550 kW
Thermal power:	525 kW
Installation:	Container

Further information: Gas produced from organic waste of a community of 900,000 people generates electric power and heat, utilizing an attractive Feed-In-Tariff (FIT). While also reducing greenhouse gas, the digested residue is sold as high-quality organic fertilizer.





Funabashi Sewage Treatment Plant.

Field of application:	Wastewater Treatment
Country:	Japan
Location:	Funabashi, East Tokyo
CHP type:	3x agenitor 306
Gas type:	Sewage gas
Electrical capacity:	750 kW
Thermal power:	900 kW
Installation:	3x Container

Further information: Gas from sewage sludge originating from both domestic and industrial waste water, generating highly efficient electric power and heat, utilizing an attractive Feed-In-Tariff (FIT) while also reducing greenhouse gas emissions.

