



# CAT® CG170

Series Gas Generator Sets



**CAT® CG170**

# SMARTER ENERGY SOLUTIONS

## **COMMERCIAL AND INDUSTRIAL FACILITIES**

Facilities such as manufacturing plants, resorts, shopping centers, office or residential buildings, universities, data centers and hospitals reduce operating costs and carbon footprint simultaneously.

## **ELECTRIC UTILITIES**

Caterpillar has led innovation to deliver stationary and containerized gas power plants to electric utilities and district energy facilities around the world for both continuous grid support and peak electricity demand.

## **MINES**

Mining operators increase mine safety and reduce carbon emissions with coal gas, while many other mining operations are realizing the benefits of onsite gas power generation to support greenfield site development.

## **AGRICULTURE AND FOOD / BEVERAGE PROCESSING**

Biogas, a useful byproduct of the anaerobic digestion of organic waste, is created by food processors, ethanol and biodiesel manufacturers, and farms around the world as a renewable fuel resource for Cat® powered electricity generation.

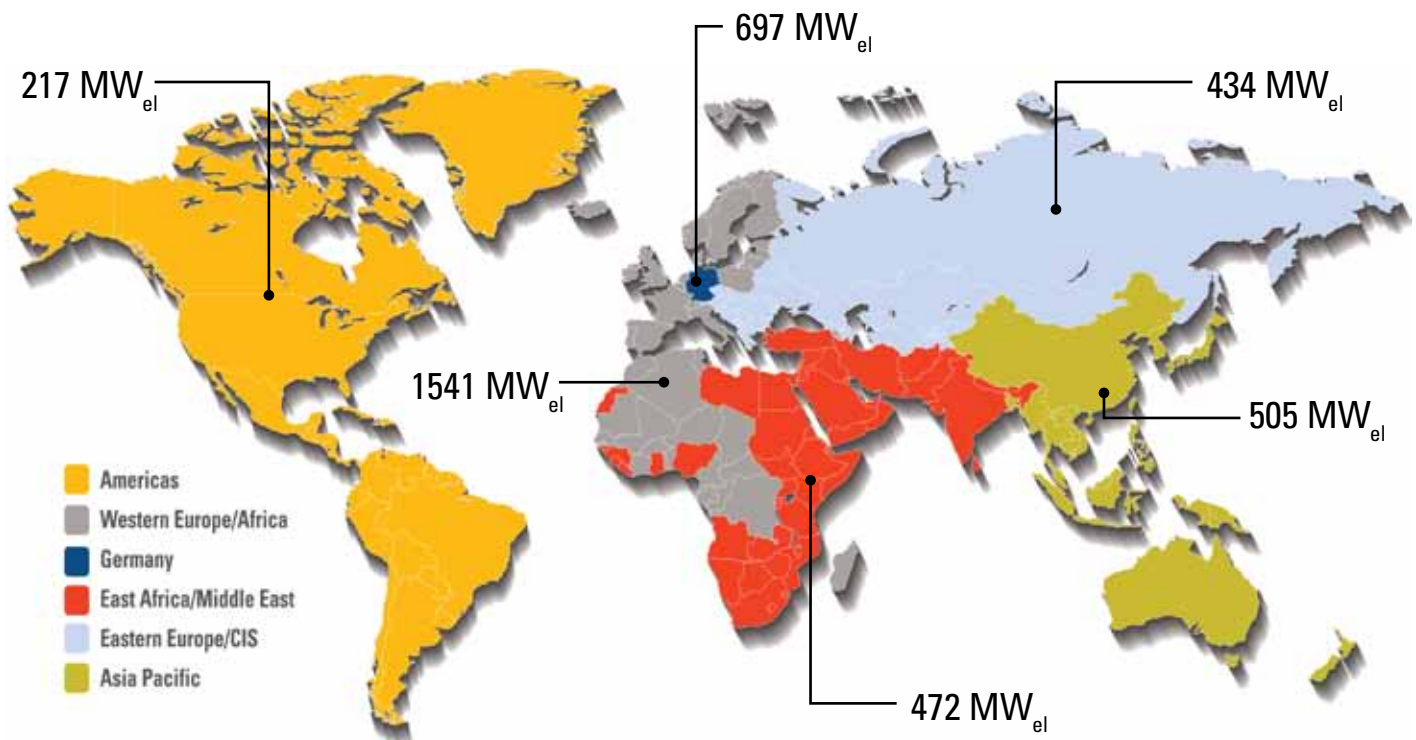
## **LANDFILLS AND WASTEWATER TREATMENT PLANTS**

Landfill and sewage gases are generated by communities around the world as part of sanitary process infrastructure. Instead of destroying or flaring the methane gas produced, communities make beneficial use of this fuel as part of a sustainable energy program.

## **GREENHOUSES**

In greenhouses, Cat gas generator sets simultaneously deliver electricity for lighting or sale to the local grid, hot water for facility heating, and carbon dioxide as an organic fertilizer for increased crop production.

## Installed capacity of 3,866 MW<sub>el</sub> with more than 2,854 generator sets worldwide



### MEETING YOUR NEEDS HAS SHAPED OUR HISTORY

At Caterpillar, we understand what it takes to deliver a successful gas power generation system, and it starts with a core machine that is designed for efficiency and reliability. Since the 1920s, Caterpillar has been designing and building engines for power production. Although the technology has changed over the years, the philosophy hasn't: to deliver the most reliable power generation at the lowest possible cost of ownership and operation. Today, Caterpillar not only manufactures power generation equipment, but we also provide customized project financing and trade solutions via Cat Financial and Cat World Trade.

### THE COMPLETE SOLUTION

Caterpillar is your complete gas solutions partner. From mechanical systems such as gas fuel train and heat recovery systems, to exhaust aftertreatment that complies with the world's most stringent emission requirements, Cat Gas Solutions engineering works with your local Cat dealer to deliver a complete scope of supply. Caterpillar also provides electrical systems such as master controls and paralleling switchgear, electrical distribution switchgear and uninterruptible power supplies (UPS) that can meet either UL or IEC requirements.

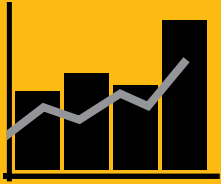
### PRODUCT SUPPORT WORLDWIDE

Your gas power system is supported by our factory trained global network of Cat dealers. Therefore, you can rest assured that your equipment will be ordered, delivered, installed and commissioned in consultation with a local expert. You'll also have the confidence that Caterpillar will be there to keep you up and running. Cat dealers have over 1,600 dealer branch stores operating in 200 countries to provide the most extensive post-sales support including oil and fuel monitoring services, preventive maintenance and comprehensive customer support agreements.

### LOWER LIFE CYCLE COST

With longer maintenance intervals, higher fuel efficiency and competitive repair options, Caterpillar delivers the lowest total owning and operating costs. When you design your facility within the Cat Application and Installation Guidelines, you can expect generator set availability up to 99 percent of planned operating hours annually. It all adds up to a strong return on your investment, year after year.

# CG170: HIGH PERFORMANCE W



## HIGHLY EFFICIENT

With recent improvements of inlet ducting, combustion chamber design and high efficiency spark plugs, the CG170 gas generator delivers up to 43.7 percent electrical efficiency and more recoverable heat while reducing carbon emissions.



## LOWER OPERATING COSTS

An optimized lubrication system means that the CG170 consumes up to 1,900 liters (500 gallons) less lubricating oil each year than competing gas generators, which means more money stays in your company's pockets.



## GREATER AVAILABILITY

The CG170 utilizes soot-free combustion with chamber plugs for extended maintenance intervals up to 4,000 hours. Newly optimized blow-by gas recirculation reduces turbocharger maintenance intervals and boosts efficiency.



## SYSTEM CONTROL

Control the entire system, not just the engine, with the Cat Total Electronic Management System. Control or monitoring of ancillary equipment such as heat recovery modules, exhaust aftertreatment and fuel treatment systems becomes seamless. Features like temperature monitoring for each cylinder and anti-knock control allow for maximum power output and the best possible fuel utilization, even with fluctuating gas composition.



## HIGH TRANSIENT RESPONSE

When your facility requires operation isolated from the electric utility grid, an optimized CG170 turbocharging system is provided to ensure transient load response that will keep your operation running.



**WITH LOW OPERATING COSTS**



## 50 Hz PRODUCT PERFORMANCE

ENGINE TYPE	UNITS	CG170-12		CG170-16		CG170-20	
Bore/stroke	mm in	170/195	6.7/7.7	170/195	6.7/7.7	170/195	6.7/7.7
Displacement	l in <sup>3</sup>	53.1	3,240	70.8	4,320	88.5	5,401
Speed	rpm	1500		1500		1500	
Mean piston speed	m/s ft/s	9.8	32	9.8	32	9.8	32
Length <sup>1)</sup>	mm in	4,640	183	5,360	211	6,200	244
Width <sup>1)</sup>	mm in	1,810	71	1,810	71	1,710	67
Height <sup>1)</sup>	mm in	2,210	87	2,210	87	2,190	86
Dry weight genset	kg lb	10,600	23,373	12,600	27,783	17,200	37,926

## NATURAL GAS

ENGINE TYPE	UNITS	CG170-12		CG170-16		CG170-20	
Electrical power <sup>2)</sup>	kW <sub>e</sub>	1,200		1,560		2,000	
Mean effective pressure	bar psi	18.6	270	18.1	274	18.6	270
Thermal output (+/-8%) <sup>3)</sup>	kW Btu/m	1,189	67,677	1,576	89,705	1,977	112,530
Electrical efficiency <sup>2)</sup>	%	43.7		43.3		43.7	
Thermal efficiency <sup>3)</sup>	%	43.3		43.8		43.2	
Total efficiency	%	87.0		87.1		86.9	

**NO<sub>x</sub> ≤ 500 mg/Nm<sup>3</sup>, 1 g/bhp-h**

## BIOGAS

ENGINE TYPE	UNITS	CG170-12		CG170-16		CG170-20	
Electrical power <sup>2)</sup>	kW <sub>e</sub>	1,200		1,560		2,000	
Mean effective pressure	bar psi	18.6	270	18.1	263	18.6	270
Thermal output (+/-8%) <sup>3)</sup>	kW Btu/m	1,249	71,093	1,641	93,405	2,021	115,035
Electrical efficiency <sup>2)</sup>	%	42.1		41.8		42.9	
Thermal efficiency <sup>3)</sup>	%	43.8		44.0		43.3	
Total efficiency	%	85.9		85.8		86.2	

**NO<sub>x</sub> ≤ 500 mg/Nm<sup>3</sup>, 1 g/bhp-h**

1) Transport dimensions of genset; components set up separately must be taken into consideration.

2) According to ISO 3046/1 at voltage = 11 kV, PF = 1.0 for 50 Hz, and a minimum methane number of MN 70 for natural gas, MN 130 for biogas.

3) Cooling of the exhaust gases to 120° C (248° F) for natural gas and 150° C (302° F) for biogas, plus engine jacket water heat.

NO<sub>x</sub> emissions: Measured as NO<sub>2</sub> dry exhaust gas @ 5% O<sub>2</sub>

Biogas fuels assumed to meet published engine-in contaminant limits with compositions:

Sewage gas (65 % CH<sub>4</sub> / 35 % CO<sub>2</sub>)

Biogas (60 % CH<sub>4</sub> / 32 % CO<sub>2</sub> / 8% N<sub>2</sub>)

Landfill gas (50 % CH<sub>4</sub> / 27 % CO<sub>2</sub> / 23% N<sub>2</sub>)

Minimum heating value (LHV) = 18.0 MJ/Nm<sup>3</sup> or 457 Btu/scf.

Specifications for special gases available.

Engine configuration with dry exhaust manifolds.

Data is representative and non-binding. Contact your Cat dealer for site and fuel specific performance.

## 60 Hz PRODUCT PERFORMANCE

ENGINE TYPE	UNITS	CG170-12		CG170-16		CG170-20	
Bore/stroke	mm in	170/195	6.7/7.7	170/195	6.7/7.7	170/195	6.7/7.7
Displacement	l in <sup>3</sup>	53.1	3,240	70.8	4,320	88.5	5,401
Speed	rpm	1500		1500		1500	
Mean piston speed	m/s ft/s	9.8	32	9.8	32	9.8	32
Length <sup>1)</sup>	mm in	4,640	183	6,640	261	7,470	294
Width <sup>1)</sup>	mm in	1,810	71	1,790	70	1,710	67
Height <sup>1)</sup>	mm in	2,210	87	2,210	87	2,190	86
Dry weight genset	kg lb	10,600	23,373	14,850	32,744	19,400	42,777

## NATURAL GAS

ENGINE TYPE	UNITS	CG170-12		CG170-16		CG170-20	
Electrical power <sup>2)</sup>	kW <sub>e</sub>	1,200		1,550		2,000	
Mean effective pressure	bar psi	18.8	273	18.2	264	18.8	273
Thermal output (+/-8 % <sup>3)</sup>	kW Btu/m	1,196	68,076	1,589	2,003	1,983	112,872
Electrical efficiency <sup>2)</sup>	%	43.4		43.0		43.5	
Thermal efficiency <sup>3)</sup>	%	43.2		43.7		43.2	
Total efficiency	%	86.6		86.7		86.7	

**NO<sub>x</sub> ≤ 500 mg/Nm<sup>3</sup>, 1 g/bhp-h**

## BIOGAS

ENGINE TYPE	UNITS	CG170-12		CG170-16		CG170-20	
Electrical power <sup>2)</sup>	kW <sub>e</sub>	1,200		1,550		2,000	
Mean effective pressure	bar psi	18.8	273	18.2	264	18.8	273
Thermal output (+/-8%) <sup>3)</sup>	kW Btu/m	1,258	71,605	1,657	94,316	2,027	115,376
Electrical efficiency <sup>2)</sup>	%	41.5		41.4		42.6	
Thermal efficiency <sup>3)</sup>	%	43.8		43.9		43.6	
Total efficiency	%	85.6		85.3		86.0	

**NO<sub>x</sub> ≤ 500 mg/Nm<sup>3</sup>, 1 g/bhp-h**

1) Transport dimensions of genset; components set up separately must be taken into consideration.

2) According to ISO 3046/1 at voltage = 4.16 kV, PF = 1.0 for 60 Hz, and a minimum methane number of MN 80 for natural gas, MN 130 for biogas.

3) Cooling of the exhaust gases to 120° C (248° F) for natural gas and 150° C (302° F) for biogas, plus engine jacket water heat.

NO<sub>x</sub> emissions: Measured as NO<sub>2</sub> dry exhaust gas @ 5% O<sub>2</sub>

Biogas fuels assumed to meet published engine-in contaminant limits with compositions:

Sewage gas (65 % CH<sub>4</sub> / 35 % CO<sub>2</sub>)

Biogas (60 % CH<sub>4</sub> / 32 % CO<sub>2</sub>, rest N<sub>2</sub>)

Landfill gas (50 % CH<sub>4</sub> / 27 % CO<sub>2</sub>, rest N<sub>2</sub>)

Minimum heating value (LHV) = 18.0 MJ/Nm<sup>3</sup> or 457 Btu/scf.

Specifications for special gases available.

Engine configuration with dry exhaust manifolds.

Data is representative and non-binding. Contact your Cat dealer for site and fuel specific performance.

**For more information and to contact your local Cat dealer,  
visit [www.catelectricpowerinfo.com/gas](http://www.catelectricpowerinfo.com/gas)**

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