



**Power  
Generation**

# Peaking Power

Lean-burn to meet peak demand.

**Our energy working for you.™**

# Prime Time Technology

The future of utility peaking power requires adaptable, comprehensive and, most importantly, economical solutions. Cummins Power Generation combines innovative products with industry-leading expertise and a business philosophy centered on serving you.

## **Cummins Power Generation lean-burn gas generator sets**

Cummins Power Generation Inc. lean-burn gas engine generator sets come from the power experts you have trusted for almost 90 years. Behind that history lays the knowledge and innovation to meet a growing demand for new methods of on-site generation.

Cummins Power Generation's lean-burn gas generator sets are a powerful, single-source solution integrating into one reliable, efficient total power system. Our PowerCommand® controls power an industry- leading paralleling and controls capability.

From the moment Cummins begins to discuss and understand a customers requirements, we will do everything we can to help them achieve their mission. This means during design and construction as well as service support after the plant is in operation.



## Why lean burn gas?

Traditional wisdom is that diesel generator sets should be used for peaking applications because gas generator sets are significantly more expensive than diesel generator sets.

While a lean burn gas generator set, by itself, is generally more expensive than a diesel, the total cost of ownership of a lean burn gas generator set is often lower than that of a diesel.

**Emissions:** Most peaking applications must meet stringent exhaust emissions regulations. For a diesel generator set, this means after-treatment, which can be very expensive. Because lean burn gas generator sets have lower engine out emissions, the after-treatment system can be smaller and less costly than for a diesel, and many installations can meet regulations with no after-treatment.

**Fuel storage:** Diesel fuel storage requires an onsite storage tank, and many local regulations require a containment area to prevent tank leaks from contaminating the environment. Unless properly cared for, diesel fuel has storage life limitations. A gas generator set does not require storage of onsite fuel.

**Fuel availability:** Diesel fuel usually needs to be delivered to the power plant by truck. In crisis situations, it may not be possible to get fuel delivered to the site.

**Maintenance cost:** The oil change interval can be three to five times longer on a gas generator set than for a diesel generator set, which can significantly reduce maintenance costs.

**Fuel cost:** Natural gas fuel has a 30-70% lower cost per unit of energy than diesel fuel. It can take only 800-2000 operating hours to payback the higher initial cost of a gas generator set.

This table illustrates the number of running hours to pay back the difference between a gas generator set and diesel generator set, based upon the fuel cost savings.

		<b>Payback operating hours</b> natural gas vs diesel fuel					
		<b>\$4.00</b>	<b>\$6.00</b>	<b>\$8.00</b>	<b>\$10.00</b>	<b>\$12.00</b>	<b>\$4.00</b>
<b>Diesel Fuel Costs</b> \$/gallon	<b>\$1.50</b>	2,800	4,000	7,200	36,200	Negative	Negative
	<b>\$2.00</b>	1,800	2,300	3,000	4,500	9,100	90,500
	<b>\$2.50</b>	1,300	1,600	1,900	2,400	3,300	5,200
	<b>\$3.00</b>	1,100	1,200	1,400	1,600	2,000	2,600
	<b>\$3.50</b>	900	1,000	1,100	1,200	1,400	1,700
	<b>\$4.00</b>	800	800	900	1,000	1,100	1,300
			<b>Natural Fuel Costs</b> \$/million BTU				

Electrical efficiency: 40% for both gas and diesel  
Cost difference: \$150,000 \$/MW



### A Peaking Power Solution for Tennessee Valley Authority

The Tennessee Valley Authority (TVA) needed economical peaking power for a power plant in McMinnville Township, a town with approximately 13,000 people. Twelve lean-burn gas engine generator sets from Cummins Power Generation power a 21 MW peaking power plant operated by Atmos Power Systems, Inc. The application employs multiple generator sets running in parallel. What sets Cummins Power Generation apart is the ability to deliver a comprehensive solution to synchronize with the utility grid. Cummins Power Generation's lean-burn generator sets, combined with its proprietary PowerCommand® digital controls, allowed for multiple generator sets to run seamlessly.

# Experiencing Flexible Capacity

## Why gas-powered?

Gas-powered reciprocating engines from Cummins Power Generation are a cost-effective alternative to diesel fuel, while offering increased flexibility to meet your peaking power demand.

**Controlled capacity flexibility:** Our generator sets allow you to add capacity in increments ranging from 300 kW to 2 MW. As load requirements increase, our solution allows you to add units quickly to continuously meet the demand without shortfall or excess.

**Fuel flexibility:** Cummins lean-burn gas engine generator sets are capable of running on a wide variety of gas resources—from pipeline natural gas to field gas or even bio-gas.

**Operational flexibility:** Cummins lean-burn gas engine generator sets allow you to independently dispatch any number of units in accordance with your requirements. Our generator sets start and accept load quickly, improving operating economies at all levels of use.

**Geographical flexibility:** Cummins generator sets can be containerized for easier installation and portability. When power use changes, these “moveable assets” can be deployed quickly to other locations.

**Emissions flexibility:** Our generator sets emit extremely low levels of NOx and other pollutants, helping you meet the most stringent emissions standards at greater capacity.

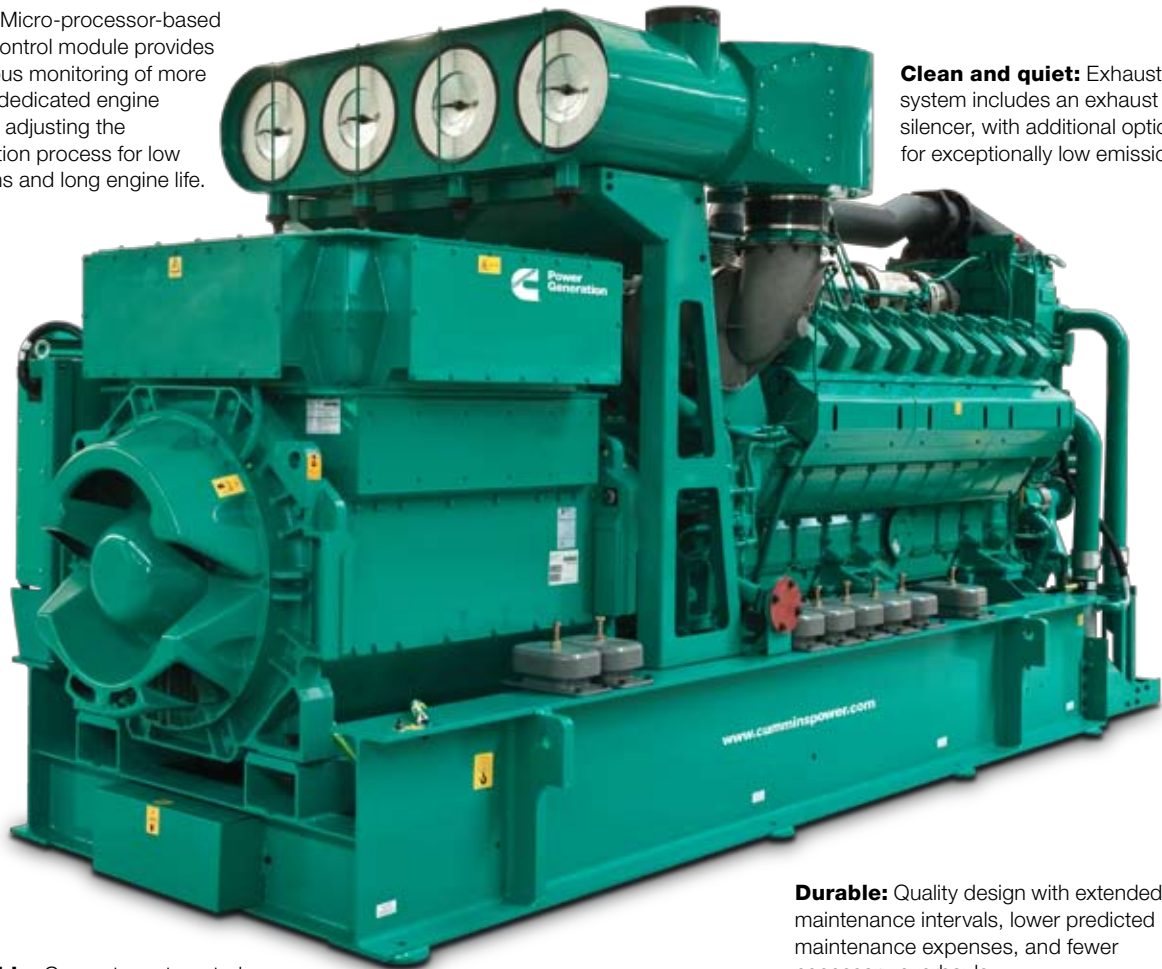
**Maintenance flexibility:** Having multiple generator sets allows for uninterrupted service during routine and emergency maintenance.



## Today's most advanced generator set is...

**State of the art:** Computerized systems continuously record critical data "snapshots" of operational faults and trend data for easy maintenance and diagnostics.

**Smart:** Micro-processor-based engine control module provides continuous monitoring of more than 20 dedicated engine sensors, adjusting the combustion process for low emissions and long engine life.



**Clean and quiet:** Exhaust system includes an exhaust silencer, with additional options for exceptionally low emissions.

**Adaptable:** Generator set controls can be tailored to meet application-specific control, monitoring and interface needs.

**Durable:** Quality design with extended maintenance intervals, lower predicted maintenance expenses, and fewer necessary overhauls.

**Efficient and reliable:** Full authority electronic Cummins engine management system controls knock, optimizes efficiency, and manages low exhaust emissions.



### Lean-burn means clean burn

Cummins Power Generation gas-powered generator sets are powered by proven four-stroke, high-speed, spark-ignited engines designed for increased performance and reduced emissions. Using a lean mixture of air and fuel, our generator sets produce more power with greater efficiency.

Cummins Power Generation lean-burn generator sets can meet most emissions for NO<sub>x</sub>, volatile organic compounds, carbon monoxide and particulate matter. Using factory-integrated aftertreatment options, our generator sets have been proven to meet the most stringent emissions regulations in the world.

# The Power of One™ ...

## A complete solution

Cummins Power Generation is dedicated to providing total solutions for reliable power, wherever you are. Our customer-focused philosophy is about providing you a total power solution.

We can tailor our offering to meet your smallest need, or scale upward to power an entire plant. We will continue to work with you throughout the life of our project to provide reliable supply to match your changing demand.

Cummins Power Generation's PowerCommand® master control system offers more than 80 features to enhance power system reliability, power quality, maintenance and the ability to dispatch via remote communications networks. Our system uses patented control technologies to achieve outstanding steady-state stability and load acceptance.



### Digital Control System

The Cummins PowerCommand® based Digital Control System provides an extensive array of integrated standard control and display features. PC-based graphic interface utilizes touchscreen operation and layered menus for ease of operation.

## Integration, the next step

Whether the solution is big or small, Cummins Power Generation will work with you to make sure it is complete. We offer a full suite of energy solution services, including:

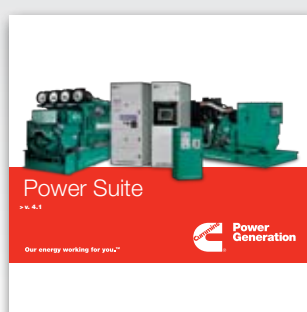
- Design / Application engineering
- Construction
- Maintenance

## And a lot more

Unlike other manufacturers, Cummins Power Generation offers turnkey self-monitoring peaking power solutions. For more than a decade, our products have made us an industry pioneer in power integrated system designs. All major components of our systems—the engine, alternator, generator sets, switchgear, and control systems—are designed and produced by one manufacturer to work together as a complete system.

That means a fully-integrated solution that can be scaled to your peak demand needs.

For more information about how Cummins Power Generation's lean-burn gas engine generator sets can help you meet peak demand, call 973-316-6030.



### Cummins Power Generation Power Suite

A collection of product information and software tools to manage and access information. Including GenSize™, the most comprehensive, easy to use sizing software in the marketplace and GenSpec™, which contains product sample guide specifications that can be used to generate custom specifications for power generation equipment.



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