



# Cogeneration

## > Case History

Jinqiao Sports Center, China



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Generation**

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### **Where:**

Jinqiao Sports Center, Shanghai, China

### **What:**

A 315 kW lean-burn gas generator set and waste heat recovery boiler producing 1.5 million Btu per hour

### **Purpose:**

To reduce overall energy costs and improve power reliability by generating electric power on-site and using the engine's exhaust to provide domestic hot water and heat the swimming pool

### **Primary choice factors:**

Cummins Power Generation was able to provide a complete turnkey system that included efficient generating and heat-recovery equipment, engineering design, operational and maintenance training, and assistance in securing subsidies and discounts

## **CHP system from Cummins Power Generation Inc. powers Jinqiao Sports Center in China**

SHANGHAI, CHINA — Visitors to the 120,000-square-foot Jinqiao Sports Center located in Shanghai's Pudong Development Zone can exercise in comfort, thanks to a new combined heat and power (CHP) system from Cummins Power Generation. The CHP system uses natural gas to power an on-site electric generator that supplies electricity to the facility, while the waste heat from the engine is used to make hot water and heat the swimming pool and building. The CHP system is so efficient that the center's energy cost savings will pay for the system in less than three years.

For any large-scale recreational center, energy consumption is a significant operating expense. Energy is needed to heat pools, provide hot water for showers, space lighting, heating and cooling. Because the center also houses a shopping mall and several restaurants, it is crucial to have a reliable supply of heat and electricity at all times.

By having an on-site generator running in parallel with the normal utility power, the sports center benefits from higher power reliability than if the facility were using



Waste heat from the Cummins Power Generation generator set is used to heat the center's swimming pool and domestic hot water system.



The Cummins Power Generation QSK19G lean-burn natural gas engine generator produces 315 kW of electricity and 1.5 million Btu of heat per hour.

utility power alone. A CHP system is economical because of its high efficiency, converting 83.4 percent of the energy in the fuel into usable electricity and heat. This is two and a half times more efficient than the energy provided by a typical electric utility grid.

#### **CHP module is complete system**

Jinqiao's CHP system is powered by a Cummins Power Generation QSK19G lean-burn natural gas engine generator that produces 315 kW of electricity. A heat-recovery boiler captures 1.5 million Btu-of-heat per hour of heat energy from the engine's exhaust and cooling water circuits. The CHP system is able to meet about half of the electrical demand from the center and nearly all of the heat demand.

*"Cummins Power Generation has provided us with the right technological solution as well as a complete turnkey service solution."*

The system operates in parallel with the local power grid, which provides the remaining electricity needed by the facility.

According to Fu Qi, general manager of the center's Assets Division, "Decentralized CHP is still a new concept in China, and customers generally lack experience with the equipment and its operation. But Cummins Power Generation has provided us with the right technological solution as well as a complete turnkey service solution."

#### **One of China's first CHP applications**

The Jinqiao CHP installation is one of the first such projects in China and could not have been possible without the support and approval of the local government, center officials say. So far, Shanghai is the only city in China where on-site power systems are permitted to

operate in parallel with the power grid. Incentives provided by the city encourage the installation of systems that improve energy efficiency. The natural gas consumed by the lean-burn gas engine generator is provided by the city at a special discount, which significantly reduces operating costs. The city also provided a \$26,775 grant (\$85 per kW), which will help give the center a better return on its investment.

Currently, the CHP system operates 14 hours each day, from early in the morning until midnight. "Every hour the system runs, it saves money," says Yaping Liu, energy business solutions director, Cummins Power Generation, East Asia. "We hope other regions in China will lift their restraints on CHP technology and adopt a more favorable policy like Shanghai. That would lead to a better market future for this environmentally friendly and cost-effective energy solution."

Liu adds that the Cummins Power Generation 315 kW CHP module is ideal for any facility that has a simultaneous need for electricity and heat in the form of steam, hot air or hot water. By creating a virtually complete CHP system in a compact package, Cummins Power Generation has made it easier for businesses everywhere to get control of energy costs while conserving natural resources, he says.

Cummins Power Generation services include engineering design, procurement advice and making the formal application for paralleling approval from the power grid. The company also provides system installation and commissioning, operational and maintenance training and round-the-clock system monitoring.

For more information about cogeneration power systems or other energy solutions, contact your local Cummins Power Generation distributor or visit [www.cumminspower.com/energysolutions](http://www.cumminspower.com/energysolutions).

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