

# FLEX TURBINE® PERFORMANCE



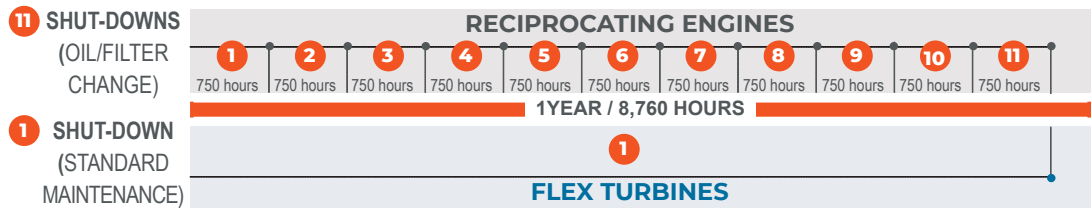
**FLEXENERGY**  
SOLUTIONS

Flex Energy Solutions is an alternative energy provider of reliable, clean power to commercial and industrial sites throughout the world. Our gas-fired Flex Turbines are robust, industrial-grade systems that burn clean and enable industrial operations to offset or replace the utility grid.

## THE ADVANTAGES OF FLEX TURBINES OVER ALTERNATIVES:

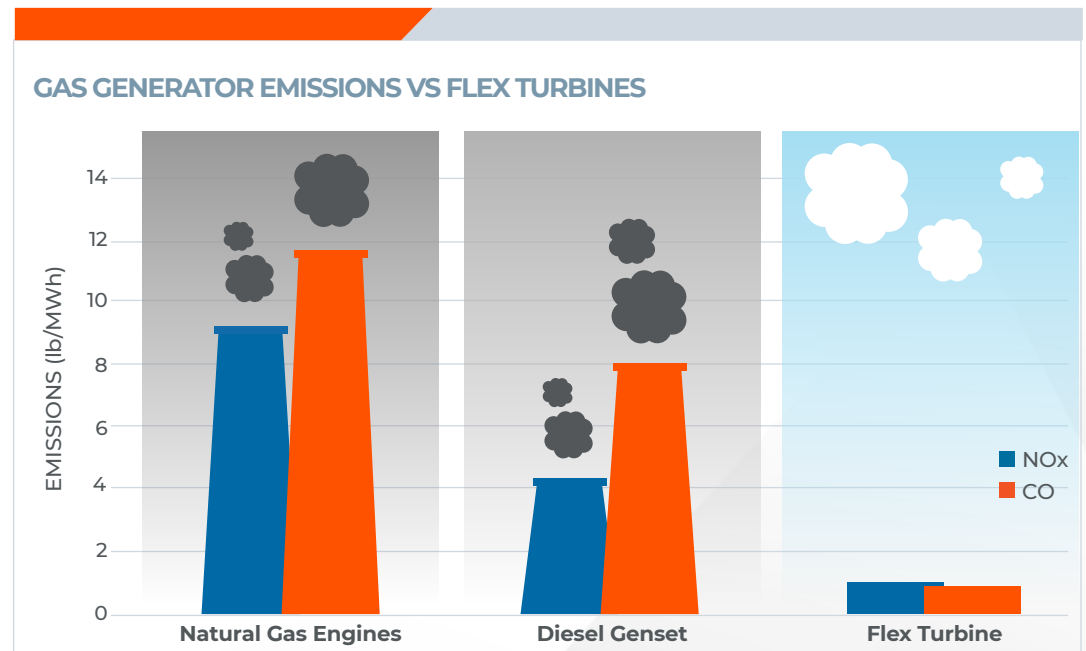
A number of heavy industries are challenged to operate in extreme climates or harsh environments all over the world. In many of these areas, a reliable power source is not only necessary, but critical to maintaining functionality and production. Flex Turbines are the smartest power solution available for both off- and on-grid applications. Remote monitoring provides instant communication and their robust design is ideally suited for isolated, remote, and extreme conditions. But these aspects are just a few in a long list of performance advantages that Flex Turbines offer over alternative sources.

### 1. LOW ANNUAL MAINTENANCE



Flex Turbines require just one eight-hour period of scheduled maintenance per year. Overhaul of the Flex Turbine's prime mover is required just once every five to seven years. Reciprocating engines require shutdowns for maintenance every 750 hours and a top end rebuild every two years.

### 2. LOW EXHAUST EMISSIONS



While some diesel gensets emit less than comparable natural gas engines, the transfer of diesel fuel to power them drives the total emissions to significantly higher levels. Meanwhile, Flex Turbines meet the California Air Resources Board Distributed Generation Standard when operating on pipeline natural gas with our integrated cogeneration heat exchanger.

**3. LOW SOUND EMISSIONS:** Flex Turbines can be fitted with low sound treatment to produce only 57 dB(A) at 10 meters.

**4. UNRIVALED RELIABILITY/AVAILABILITY:** Flex Turbines have accumulated more than six million hours of service. Our fleet of leased turbines has consistently maintained 99+% average uptime over the last five years and beyond.

**5. WIDE FUEL TOLERANCE:** With the widest fuel operating envelope of any gas engine or gas turbine on the market, from 40% methane to 100% propane, Flex Turbines require no re-rating or derating based on gas composition.

**6. OIL LUBRICATED BEARINGS:** Flex Turbines use oil lubricated bearings, designed for applications in harsh environments. Comparable small gas turbines use air lubricated bearings – unsuitable for applications in extreme environments. Our pressurized seal design prevents combustion products from contaminating the lubricating oil, providing engine resiliency. The oil system of reciprocating engines is exposed to combustion products that can quickly acidify and break down the oil.

**7. GRID ISOLATED APPLICATIONS:** Flex Turbine's synchronous generator produces enough starting kVA to start a 125 HP (90 kW) motor direct-on-line. Coupled with the generator braking resistor (GBR), the turbine can follow highly cyclic and transient loads.

**8. CLOSED TRANSITION DUAL MODE:** Flex Turbines can seamlessly transition from grid-parallel to grid-isolated operation in case of a grid outage. When the grid returns and is stable, Flex Turbines resynchronize without having to disconnect from the facility.

**9. AMBIENT TEMPERATURE RATING:** Due to air density differences, gas turbine ratings change based on variations in ambient temperatures and elevation. Flex Turbines decrease output above ISO conditions (15°C, sea level, 60% RH) and increase output below ISO conditions.

## 10. COST AND PERFORMANCE CHARACTERISTICS

| MICROTURBINE CHARACTERISTICS          | SYSTEM              |                |
|---------------------------------------|---------------------|----------------|
|                                       | Flex Turbine GT333S | Capstone C200  |
| Heat Output (kW equivalent)           | 450.2               | 258.9          |
| Total CHP Efficiency (%), HHV         | 67.5%               | 63.0%          |
| Total CHP Efficiency (%), LHV         | 74.6%               | 69.6%          |
| Power/Heat Ratio                      | 0.71                | 0.73           |
| Net Heat Rate (Btu/kWh)               | 6,170               | 6,983          |
| Effective Electric Efficiency (%) HHV | 55.3%               | 48.9%          |
| <b>COST</b>                           |                     |                |
| CHP Package Cost (\$/kW)              | <b>\$1,770</b>      | <b>\$2,120</b> |
| Total Installed Cost (\$/kW)          | <b>\$2,580</b>      | <b>\$3,150</b> |

Reference: EPA/DOE Catalog of CHP Technologies Report, September 2017

