

## WHERE ARE GAS TURBINES USED?

Originally developed for aerospace applications, the flexibility and cost effectiveness of the gas turbine has seen use of the technology extended to a wide array of applications.

### ***Medium to Large Gas Turbine Applications > 500 kW***

#### Aerospace

- Jet Propulsion

#### Marine

- Propulsion Power Source
- Electrical Power Source

#### Land-Based Power Generation

- Government Utility - Electricity Power Provider
- Remote Site Power Generation
- Distributed Generation<sup>1</sup> - Commercial Peak Shaving & Standby Power
- Mobile Power

#### Cogeneration

- Industrial Combined Heat & Power Generation
- Commercial Peak Shaving & Standby Power
- Volatile Organic Compound & Industrial Process By-product Destruction

### ***Micro Turbine Applications (< 500 kW)***

#### Distributed Generation<sup>2</sup>

- Combined Heat & Power
- Peak Shaving

#### Resource Recovery

- Oil & Gas Plants
- Landfill, Waste, & Water Treatment Plants

#### Quality & Reliable Power

- Emergency Supply
- Critical Equipment Protection Strategy

#### Hybrid Electric Vehicles

- Medium Duty Vehicles
- Light Rail

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<sup>1</sup> Smith, M. 2003, 'Gas Turbines & Microturbines for Distributed Energy Applications, *National CHP Turbine Technology and Regulatory Forum, March 5, 2003* – Office of Distributed Energy and Electrical Reliability, U.S. Department of Energy.

<sup>2</sup> *ibid.*

## **GAS TURBINES USED TO REDUCE AIR POLLUTANT LEVELS**

The application of gas turbines to reduce air pollutants created from industrial processes have been developed largely due to regulatory changes for the reduction of emission levels from these processes and the financial benefits of power generation and cogeneration.

Applications include:

- Oil & Gas Drilling & Processing where previously, waste gas was flared with no resource recovery.<sup>3</sup>
- Landfill, Waste and Water treatment plants where gases are generated from processing the waste material and can be used as a fuel for a power generating set.<sup>4</sup>
- Industrial Facilities where processes produce gas pollutants and VOC (volatile organic compounds) that require additional processing to meet regulatory requirements for emission levels.<sup>5</sup>

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<sup>3</sup> Professor Olav Hanssens, 2002. Norwegian Petroleum Directorate's annual report "Norwegian shelf 2001", and "Environment 2002 – the petroleum sector in Norway", issued by the Ministry of Petroleum and Energy, February 2004,

<<http://www.npd.no/English/Emner/Ytre+miljo/Aktuelle+milj%C3%B8tiltak.htm> >.

<sup>4</sup> Wiltsee, G. and Emerson, H.- Ingersol-Rand Energy Systems - 2003, 'Clean and Reliable Power and Heat From Digester Gas', [in] Editor (if applicable), *Anaerobic Digester Technology Applications in Animal Agriculture, A National Summit, Raleigh, North Carolina June 2-4.*

<sup>5</sup> Vericor Power Systems, 2001." ASE 8 VOC Gas Turbine Engine Specification Sheet" –, , February 2004, < <http://www.vericor.com/cogen/Vericor%20ASE8%20Spec.pdf> >.