Moses Lake, WA
What Is Bi-Fuel?

- Bi-Fuel® is a “co-firing” of standard diesel fuel and natural gas (methane)
- It is designed for use on conventional, heavy-duty & light-duty diesel engines
- No engine modifications are required
- The GTI Bi-Fuel® Systems can be installed in the field or accomplished as an OEM up-fit
- Natural gas may substitute up to 70% (max) of the diesel fuel required to maintain a given speed and load
Primary Applications

- Prime Power
- Peak Shaving
- Standby Power
- Distributed Power Generation
- Pumping applications
- Drilling Rigs, Fracing & Well Service Units
- Market Bridge
- Data Centers
Characteristics of GTI Bi-Fuel® System

- Maintains diesel-like performance and efficiency
- Compression ignition
- Low gas supply pressure
- Sophisticated Altronic engine protection system
- Auto-switching of fuel modes
- Non-intrusive, simple installation
- Easy to operate
Diesel vs. Bi-Fuel® Response Performance

100% Diesel
100% Block Load

30% Diesel / 70% Bi-Fuel
100% Block Load
Benefits to the User

- Reduced energy costs
- Rapid payback
- Extended runtime for emergency operation
- Reduced exhaust emissions
- Fuel flexibility
Fuel Gases Compatible with GTI Bi-Fuel® System

- Pipeline natural gas
- Liquid natural gas (LNG)
- Compressed natural gas (CNG)
- Wellhead gas*
- Bio-gas (landfill, wastewater, etc.)*
- Coal-bed gas*

*With proper pre-treatment
GTI Bi-Fuel® System Diagram

Gas Supply Pressure
Regulator Output Pressure (switch)
Air Filter Vacuum
Manifold Air Pressure
Manifold Air Temperature
Exhaust Gas Temperature
Engine Vibration

RS-232/RS-485 MODBUS (Optional remote monitoring)
NEW GTI TECHNOLOGY - 2011

The STEPCON® System
SYSTEM COMPONENTS –

STEPCON® Valve

• Up to 4 individual power valve setpoints.
• Maximizes substitution within widest loadband when needed
• Ideal for rapid widely variable loads such as drilling rigs
• Anodized for corrosion resistance
The STEPCON™ is designed to enhance the basic GTI bi-fuel system allowing its application over a wider load range, adjusting the optimal substitution rate based on load with the capability to make substitution level adjustments in response to rapid load changes.
STEPCON® Installed on Drilling Rig

http://www.ecoafs.com/CaseStudyVideo.asx
Proper Application

• The STEPCON™ is designed to enhance the basic GTI Bi-Fuel system
• It allows Bi-Fuel application over the widest load range
• It adjusts for the optimal substitution rate based on near real-time load
• It makes substitution level adjustments in response to rapid/drastic load changes.
• The majority of applications will continue to be satisfied by the application of the standard kit
MARKETING & TYPICAL INSTALLATIONS
Publix Supermarkets

• Location: Southeast US

• Units Installed: over 600 from 2007 to 2009

• Size: 500kw CAT C15

• Driver: Emergency Power to avoid loss of perishable food
Hospitals & Healthcare

• Location: Fort Myers, FL

• Units Installed: (2) CAT 3516 bi-fuel systems 2004

• Size: 2,000kw x 2

• Driver: Extended runtime up to 300% for emergency standby power in critical care application.
High-Rise Office / Retail Bldgs.

• Location: Toronto, Canada

• Units Installed: Cat D349 in 2005

• Size: 800 kw

• Driver: Extended runtime up to 300%. Emergency back-up power for elevators, lights, computers, etc.
Water Treatment Plant

• Location: Wichita, KS
• Units Installed: 2010
  (4) Cat 3516C’s -paralleled
• Size: 2,000kw – ea.
• 55% Substitution
• Drivers:
  a. Emergency Standby Power
  b. Extended runtime
  c. Emissions
Irrigation Pumping

- Location: Amarillo, TX and New So. Wales, Australia
- Units Installed: 2009
  - DDC Series 60
  - Cummins M11C
- Size: 350kw & 300kw
- 70% Substitution on both
- Driver: Prime power cost savings on diesel fuel. - Agriculture
Textile Manufacturing

• Location: New Delhi, India
• Units Installed: 2005 Cummins
• Size: 350kw
• Driver: Prime Power cost savings to operate small factory
• Rapid Payback – 16 days!
Oil & Gas – Drilling Rigs

• Location: Various locations in U.S., Canada, and China

• Units Installed: Approx. 350 bi-fuel systems installed on drilling rigs. Hundreds more projected 2012 – 2013

• Size: Average 1500kw x 3 engines per rig

• Driver: Huge cost savings on diesel fuel with rapid payback
Oil & Gas – Fracing Trucks

• Location: Western Canada and various locations in U.S.

• Units Installed: 11 Units to date. More companies ready to start bi-fuel testing on large fracing fleets

• Size: 1500kw - 2,000kw per engine @ 124 gph. Each frac job may require 10 – 20 engines.

• Drivers: (1) Huge Cost savings with rapid payback. (2) Reduce truck traffic to jobsite. (3) Reduce fire potential from diesel refueling.
Oil & Gas – Well Servicing Nitrogen & Foam Units

• Location: Colorado
• Units Installed: 5 units
• Size: 350kw Cat & DDC
• Average Substitution: 65%
• Driver: Huge Cost savings and rapid payback
Oil & Gas – Rental Generators

- Location: Williston, ND
- Units Installed: 40 Units
- Size: Various
- Picture: 200kw Cummins with 15,000+ hours on bi-fuel with no downtime!
- Average Substitution: 55 - 65%
- Gas: Using wellhead gas
- Driver: Temporary power to run wellhead pumps. Also, uses flaring gas!
GTI Bi-Fuel® on Drilling & Fracing Rigs

40 GTI Bi-fuel systems running on CNG
Xinjiang Province
CHINA
GTI Bi-Fuel® on Drilling & Fracing Rigs

40 GTI Bi-fuel systems running on LNG
Xinjiang Province CHINA
GTI Bi-Fuel® on Drilling & Fracing Rigs

Total Bi-fuel units sold: 2,900
Total installed on Drilling Rigs & Frac Units: 350 (12%)
GTI Bi-Fuel® on Drilling Rig

ACTUAL COST SAVINGS
with (3) STEPCON® Systems

<table>
<thead>
<tr>
<th>DIESEL</th>
<th>BI-FUEL</th>
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<tbody>
<tr>
<td>6.5 Drlg</td>
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<td>2400</td>
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<tr>
<td>48.5 Hrs</td>
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Total Drlg Time: 48.5 Hrs
Gals of Diesel: 8034
Cost of fuel: $3.50
Cost of Fuel: $28,119.00

Total Cost of Fuel: $28,119.00
Saving: $13,695.80

ACTUAL SAVINGS:
$6,848 PER DAY
MARKETING of BI-FUEL

➢ COST SAVINGS – Rapid payback and huge savings on prime power applications

➢ EXTENDED RUNTIME – Increase runtime by 300% or more on standby power applications

➢ MARKET BRIDGE – Flexible means of building LNG/CNG customer base while taking advantage of a growing infrastructure

➢ REDUCED EMISSIONS – Typical installations reduce many toxic emissions
Bi-Fueled engines are creating opportunities all over the world for LNG & CNG

• **Marine** – Inland Waterways, Coastal, and Open Water – propulsion or auxiliary

• **Flexible use of existing assets that “pay” for new dedicated equipment**

• **Areas without gas pipeline infrastructure** – stationary or mobile, remote or otherwise

• **Areas without natural gas resources**
PROMOTING CNG / LNG

“Demonstration of Gas-Powered Drilling Operations for Economically Challenged Wellhead Gas and Evaluation of Complimentary Platforms”
Thank You
For
This Opportunity!