# Presenting:

## CLEAN-BURN
TECHNOLOGY

# RED RIVER COMPRESSION

*Leading Gas Compressor Solutions*

# RRC Standard

## Exceed EPA NSPS for 100/500 hp

NOx 2g/hp-hr Or 160ppmvd, CO 4g/hp-hr Or 540ppmvd,
VOC 1g/hp-hr Or 86ppmvd @15% O2

## New Mexico PERs

NOx 1.75 g/hp-hr, CO 3.5 g/hp-hr, VOC's .7 g/hp-hr

**For new engine applications**

## CLEAN-BURN

**Technology**

# CLEAN-BURN Advantages

a. Exceed EPA emission standards
b. Increase well production – ROI
c. Reduce $CO_2$ – Green house gas
d. NO catalysts to maintain or replace
e. Less heat in engine = longer life, fewer problems, longer run times!

# Bakersfield California

## Test Results of retro GM 454

Case #1 – 1997 GM454 with 18,150 hours Bakersfield California

Installed March 2007

- Exhaust temperature reduction of 277.7 degrees
- Fuel use reduction of 34%
- $CO_2$ reduction of 34%
- Nox 40 ppmvd – EPA .5g/hp-hr
- CO 4 ppmvd – EPA .029g/hp-hr
- VOC 3.24ppmvd – EPA .038 g/hp-hr

# CLEAN-BURN Technology Economics

## Case # 1 – Fuel use comparison

Before RRC Clean-burn - 17.63mcf/day
After RRC Clean-burn – 11.68mcf/day
Sales increase 5.95 mcf/day @ $7.00
$41.65 /day or $15,202.25/ year
To retrofit the engine cost $7,500.00

**Exceed EPA emissions & receive A 200% ROI!**

# CBGM8.1 Vs Cummins 8.3
## both w/LeRoi HG12 - 64HP Req'd

| Case #2 | CBGM 8.1 rated 74 hp | Cummins 8.3 rated 118 hp |
|---|---|---|
| Exhaust heat | 655 degrees | 1140 degrees |
| NOx | 98 ppmvd | 1527 ppmvd |
| CO | 117 ppmvd | 109 ppmvd |
| VOC's | not required | ??? |
| CO2 | 8.4% | 9.8% |
| O2 | 6.0% | 3.4% |

**How many mcf/day equal 485 degrees?**

# CLEAN-BURN Technology Economics

**Case # 2 – Bloomfield NM**

**Before RRC Clean-burn - 110mcf/day**
**After RRC Clean-burn – 121mcf/day**
**Sales increase 11mcf/day @ $7.00**
**$77.00 /day or $28,105.00 / year**

**Exceed EPA emissions & have a ROI!**

# CLEAN-BURN Technology Power Generation

**Emission advantages for Intermittent loaded & under powered HP engines.**

# Intermittent Load Emissions

418A Middle Mesa

```
**********************
* E C O M  -  J 2 K N *
**********************
Date        Time
04.06.08    03:57 PM
----------------------
Gas analysis
----------------------
Fuel type
Natural gas
----------------------
T.Air          71   °F
T.Gas         633   °F
T.Sensor       74   °F
O2            7.4   %
CO  15%O2     313   ppm
NO  15%O2       2   ppm
NO2 15%O2       7   ppm
NOx 15%O2       9   ppm
CO2           7.6   %
Eff.         74.0   %
Losses       26.0   %
Exc. air     1.54
----------------------
ECOM America Ltd.
1628 Oakbrook Drive
Gainesville
Georgia 30507
Tel. 770-532-3280
Fax: 770-532-3620
Toll-Free 877-326-6411
www.ecomusa.com
```

Unloaded

418A Middle Mesa

```
**********************
* E C O M  -  J 2 K N *
**********************
Date        Time
04.06.08    03:57 PM
----------------------
Gas analysis
----------------------
Fuel type
Natural gas
----------------------
T.Air          70   °F
T.Gas         636   °F
T.Sensor       74   °F
O2            6.5   %
CO  15%O2     300   ppm
NO  15%O2       2   ppm
NO2 15%O2       7   ppm
NOx 15%O2       9   ppm
CO2           8.1   %
Eff.         74.6   %
Losses       25.4   %
Exc. air     1.45
----------------------
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1628 Oakbrook Drive
Gainesville
Georgia 30507
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Fax: 770-532-3620
Toll-Free 877-326-6411
www.ecomusa.com
```

Loaded

447A Middle Mesa

```
**********************
* E C O M  -  J 2 K N *
**********************
Date        Time
04.06.08    02:56 PM
----------------------
Gas analysis
----------------------
Fuel type
Natural gas
----------------------
T.Air          70   °F
T.Gas         640   °F
T.Sensor       72   °F
O2            9.1   %
CO  15%O2     445   ppm
NO  15%O2      11   ppm
NO2 15%O2       9   ppm
NOx 15%O2      19   ppm
CO2           6.6   %
Eff.         71.5   %
Losses       28.5   %
Exc. air     1.76
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Toll-Free 877-326-6411
www.ecomusa.com
```

Unloaded

447A Middle Mesa

```
**********************
* E C O M  -  J 2 K N *
**********************
Date        Time
04.06.08    02:57 PM
----------------------
Gas analysis
----------------------
Fuel type
Natural gas
----------------------
T.Air          70   °F
T.Gas         638   °F
T.Sensor       72   °F
O2            6.5   %
CO  15%O2     372   ppm
NO  15%O2       9   ppm
NO2 15%O2       7   ppm
NOx 15%O2      16   ppm
CO2           8.1   %
Eff.         74.6   %
Losses       25.4   %
Exc. air     1.45
----------------------
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Loaded

# RED RIVER

## COMPRESSION

HP supplied to industry since February 2008

58 engines = 4100 HP

Tons Nox reduced per year

336

$CO_2$ reductions as high as

34%

RED RIVER COMPRESSION

Leading Gas Compressor Solutions

- *Leading…Technology & Innovative*
- *Leading…Environmental*
- *Leading…Economic*

# Solutions!