ATTAINMENT TECHNOLOGIES, L.L.C.
EMISSION SOLUTIONS FOR TODAY

2005 Louisiana Performance Contracting Conference
New Orleans, LA
Efficiency War is Brewing

- Power is constrained, or congested, in many areas of the United States
  *But demand continues to rise!*

- Many of these areas are located in non-attainment areas as designated by the Environmental Protection Agency (EPA) *Over 40% of the country’s population lived in counties with air quality concentrations above the NAAQS in 2000!*

- Some states, regions and localities will not allow additional power plant construction *Uncertainty, overbuild, NIMBY will force further plant construction delays.*

- Demand Response/Load Curtailment programs continue to gain popularity *But, thousands of engines cannot fully participate because of emissions!*

- Tightening emissions rules and regulations *Existing base of engines not likely to meet many regulations, but remain a valuable asset.*

Smart Energy Management Drivers

Old drivers + New drivers = Future

- Conservation
- Volatile Prices
- Renewable Portfolio Standards
- Cost Savings
- Emissions
- Efficiency
- Security
- Reliability
- Shrinking supplies
- Congestion management
- Innovative rates – LMP!?
- Security
- T&D deferment
- Demand response
- National policy
- Technology
- Smart controls
- Liability (I.e. insurance)

Smart Grid (automation; controls, demand response)

Efficiency Gains (increased load factors)

Clear Skies (emissions trading)

Risk Management!

Pollution Reduction = Energy Efficiency =
Many areas are likely to violate these Standards.

Current* 8-hour Ozone and PM$_{2.5}$ Nonattainment

*1997-1999 Ozone
1999/2000 PM$_{2.5}$ - preliminary depiction based on two years of data. Three years of complete data are required for attainment demonstrations.
NO$_x$ Program Implementation Dates by State
Clean Air Interstate Rule (CAIR)

- Finalized in March, 2005.
- Covers 28 states and DC, including Louisiana.
  - Particular concern for New Orleans, Baton Rouge & Shreveport* areas.
  - Interstate trading may be allowed.
  - Phase 1 Cap in place 2009?
- Uses cap and trade mechanism to achieve deep cuts in SO2 and Nox.
  - CHP and EGU

Efficiency Improvement + Demand Reduction + Emissions Reduction = Profitable Compliance?
Emissions Reduction Credits (ERC’s)

DEFINITION: 6 NYCRR 231-2.1(b)(14)

Emission reduction credit, ERC. Any decrease in emissions of a nonattainment contaminant in tons per year, occurring on or after November 15, 1990:

(i) which is surplus, quantifiable, permanent, and enforceable; and

(ii) which results from a physical change in, or a change in the method of operation of an emission unit subject to Part 201 of this Title; and

(a) is quantified as the difference between prior actual annual emissions or prior allowable annual emissions, whichever is less, and the subsequent maximum annual potential; and

(b) is certified in accordance with the provisions of section 231-2.6 of this Subpart; or

(iii) which results from a physical change in, or a change in the method of operation of an air contamination source not subject to Part 201 of this Title, and is certified in accordance with the provisions of section 231-2.6 of this Subpart.
### Active ERC Markets (as of 2002)

<table>
<thead>
<tr>
<th>State/Region</th>
<th>Price</th>
<th>Market Outlook</th>
</tr>
</thead>
<tbody>
<tr>
<td>NY/PA Severe</td>
<td>$15,000</td>
<td>Tight supply +</td>
</tr>
<tr>
<td>NY/PA Moderate</td>
<td>$1,800</td>
<td>Oversupply -</td>
</tr>
<tr>
<td>New England Serious</td>
<td>$6,000</td>
<td>Oversupply -</td>
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<tr>
<td>MD Severe</td>
<td>$10,000</td>
<td>Tight supply +</td>
</tr>
<tr>
<td>VA Serious</td>
<td>$10,000</td>
<td>Tight supply +</td>
</tr>
<tr>
<td>GA Serious</td>
<td>$20,000</td>
<td>No supply</td>
</tr>
<tr>
<td>TX DFW</td>
<td>$10,000</td>
<td>Tight +</td>
</tr>
<tr>
<td>TX HGA</td>
<td>$10,000</td>
<td>RACT Change</td>
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<tr>
<td>CA San Diego</td>
<td>$120,000</td>
<td>No supply</td>
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<tr>
<td>CA LA</td>
<td>$45,000</td>
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<tr>
<td>CA Others</td>
<td>$8K - $35K</td>
<td>Varies</td>
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HGA Emissions Reduction Credit Example

Potential to Emit Calculation

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<th>Annual run time</th>
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<tr>
<td>Capacity</td>
<td>820</td>
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<tr>
<td>Conversion of kw to bhp</td>
<td>1.407</td>
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<tr>
<td>Conversion of gram to pound</td>
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<tr>
<td>Conversion of pound to ton</td>
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<table>
<thead>
<tr>
<th>Units</th>
<th>KW</th>
<th>HP</th>
<th>g/bhp-hr</th>
<th>grams/year</th>
<th>Lbs/year</th>
<th>Tons/year</th>
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<tbody>
<tr>
<td>1</td>
<td>820</td>
<td>1153.74</td>
<td>9</td>
<td>90,960,862</td>
<td>200,354</td>
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<tr>
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<td>820</td>
<td>1153.74</td>
<td>1.5</td>
<td>15,160,144</td>
<td>33,392</td>
<td>16.70 new rule</td>
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<tr>
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<td>5,053,881</td>
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<td>1153.74</td>
<td>0.3</td>
<td>2,958,077</td>
<td>6,516</td>
<td>3.26</td>
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Potential ERCs in tons for Nox at 0.5 grams. | 11.13 |
Market Value of ERCs for Nox/ton (2003 avg. NYC Severe Non-attainment area) | $9,000 |
Cost of Conversion and Emissions technology per engine* | $135,000 |
Aggregate Value of ERCs for Nox at 0.5 grams. | $100,170 |
Difference between conversion cost and ERC value | $34,830 |
Cost in $/ton of Nox reduced | $1,426.88 |

- Several Texas Non-attainment areas
  - HGA worst
    - Deadlines (MECT)
    - Liquid market (Prices vary per market conditions)
- DFW non-attainment, but no market- yet!
- Lower emissions requirements throughout East Texas

Potential to sell credits in Louisiana to Texas companies/districts?

Pre-sell?
Buy-down project cost?

Price example per ton of Nox.
NOx ERC Values – NYC Example

◆ $29,000 per ton was the highest trading price;
◆ $3,800 per ton was the lowest trading price;
◆ At the height of demand for new power plant construction, prices were typically $13,000, $14,000, $15000 per ton;
◆ Average price since trading began is in the $8000 per ton range;

If CHP Were Adopted:

◆ 2200 MW’s of CHP installed over the 10 Year period 2002-2012 has the following benefits:
  ◆ $1.825 Billion in User Savings
  ◆ $808 Million in net present value savings
  ◆ Annual Emission Reductions in 2012
    ◆ 10,282 tons of Nox
    ◆ 27,766 tons of SO2
    ◆ 3,854,000 tons of CO2
Louisiana Emissions Statistics
(2002) – in tons

- VOC: 77,781 tons
- NOX: 310,578 tons
- CO: 145,152 tons

Example: $1,000 per ton NOX

Year One: 10,000 ton reduction x $1,000/ton = $10,000,000
Year Two: 20,000 ton reduction x $1,000/ton = $20,000,000
Cumulative Value = 30,000 ton Nox reduction = $30,000,000