MEDIA MATERIALS

Eco Power Solutions
Multi-Pollutant Emissions Control Systems

CONFIDENTIAL - Eco Power Solutions
© 2009 - 2012
In the U.S. alone, Power Generators will invest over $50B in technology to control emissions from coal in the next 10 years. By 2020, 100% of U.S. based coal plants will be controlled for SO2, Mercury, Particulate Matter and 70% for NOx.

Eco Power Solutions’ innovative technology is changing the game by reducing multiple pollutants with an all-in-one system delivering *superior performance, value and compliance*.

We make fossil fuels clean at the *lowest cost* on the market today.
Eco Power Solutions is dedicated to the ongoing development of advanced, clean energy technologies.

**Company**
- Privately Held - Headquartered in Boston, Massachusetts
- Original Equipment Manufacturer (OEM) of patented air quality control system (AQCS) technology
- Engineering and R&D operations in Louisville, KY
- Experienced management team

**Market**
- Power Generation (Coal, Natural Gas, Oil, Biomass, and Municipal Waste) – U.S. Coal 330 GW
- Heavy Industrials (Steel & Aluminum, Glass & Cement, Paper & Pulp, Petro Chemical) – U.S. 45 GW
- Heavy Commercial (Hospitals & Universities) – U.S. 30 GW

**Proven Technology**
- COMPLY 2000™ – Advanced ‘all-in-one’ Multi-Pollutant control product
- High multi-pollutant removal rates (Hg, PM2.5, CO2, NOx, SOx, HCl, and other heavy metals)
- 5 MW units (Coal & Gas) operating since June 2010
- Performance & economics validated by multiple 3rd parties including EPRI and URS

**Strong Value Proposition**
- Lowest Levelized Cost solution on the market today for widest spectrum of pollutants removed
- Smaller footprint, shop-assembled modules, and shortest cycle time from engineering to operation
- Applicable to all fossil fuels and Energy from Waste fuel stock
- Ideal for retrofit and new build applications
- Potential expansion of primary fuel options for owner
- Downstream byproduct revenue stream
**Initial technology concept developed as answer to 1990 Clean Air Act**

- **1994**
- **1997**

**COMPLY bench scale testing at Brookhaven National Laboratory**

**2001**

**Eco Power Solution (U.S.A.) operations begin**

**2004**

**2006**

**EPRI Supplemental project notice for 25 MW slipstream commercial deployment**

**2010**

**Technology Center opened June 2010 in Louisville, KY**

**2011**

**2012**

**HISTORY & TIMELINE**

**COMPLY 2000 patent issued**

**Initial angel funding round closed**

**CO2 Conversion to Alcohol patent issued**

**Series A round of investment lead by Altira Group**

**EPRI Level II technical & economic evaluation conducted**
Efficient and cost effective emission control technologies will be key in supplying reliable power at competitive rates, while meeting environmental targets.

**GLOBAL OPPORTUNITY AND DRIVERS**

Efficient and cost effective emission control technologies will be key in supplying reliable power at competitive rates, while meeting environmental targets.

- **Large Global Market**
- **Fuel Diversity**
- **Fossil Fuel Availability**
- **Low Cost**
- **Energy Demand**
- **Reliability**
- **Existing Infrastructure**
- **Regulatory Challenges**
- **Health & Environment**
- **Social Responsibility**

- **Opportunity**
- **Driver & Need**
- **Driver & Need**
- **SOLUTION**

- Proven Performance
- Cost Effective
- Modular
- Speed to market
- Compliance
Global Market – Large Installed Base

Air Quality Standards aggressively pursued to control pollution, promote health and environmental quality in developed and emerging industrial nations.

Huge addressable market on a global scale in coal fired power generation alone even with planned retirements. Global drivers from the emergence of regulations to reduce criteria pollutants and Green House Gases.
EPA regulations have created a compliance driven market environment for Power Generators and Industrial Manufacturers.

**U.S. Regulatory Landscape**

- **MATS** (Hazardous Air Pollution Standard & New Source Performance Standards)
- **CSAPR** (Cross State Air Pollution Rule)
- **Boiler MACT** (Boiler Maximum Achievable Control Technology)
- **NAAQS** (National Ambient Air Quality Standards)
- **National GHG (Proposed)** (Proposed national greenhouse gas emission standards – new coal)

- **HAPS** – Heavy Metals (Hg) & Acid Gases (HCl)
- **NSPS** – NOx, SOx & Particulate Matter
- **NOx & SOx**
- **Mercury (Hg), SOx & Acid Gases (HCl)**
- **NOx, SOx, CO, Pb, O3 & Particulate Matter**
- **CO2**

Source: ScottMadden, EPA, N. W. Bernstein & Associates
The COMPLY 2000™ offers efficient removal rates of multiple criteria pollutants in an ‘all-in-one’ system.

### Proven Removal Rates

The removal rates as demonstrated at the Eco Power Technology Center are:

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>COMPLY 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury (Hg)</td>
<td>95%</td>
</tr>
<tr>
<td>Particulate Matter ((PM_{10} &amp; PM_{2.5})^*)</td>
<td>99%</td>
</tr>
<tr>
<td>Heavy Metals ((Cd, Cr, Ni, Be, As))</td>
<td>99%</td>
</tr>
<tr>
<td>Halogens ((F, Cl, Br))</td>
<td>99%</td>
</tr>
<tr>
<td>NO(_x)</td>
<td>98%</td>
</tr>
<tr>
<td>SO(_x)</td>
<td>99%</td>
</tr>
<tr>
<td>CO(_2)</td>
<td>30%</td>
</tr>
</tbody>
</table>

* Downstream of primary particulate collection device.

Unsurpassed “multi-pollutant” removal efficiencies
Sustaining fossil fuel generating assets requires disruptive technology to reduce multiple pollutants
Demonstrated performance for 2+ years

Generation Capacity at risk due to regulatory environment. Co-ops and public power at greatest risk.

<table>
<thead>
<tr>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Power Generation – Coal Fired Fleet</td>
<td>330 GW</td>
</tr>
<tr>
<td>Coal Fired Generation &gt; 30 years old</td>
<td>222 GW</td>
</tr>
<tr>
<td>Post Fleet Retirement Available Market</td>
<td>150 GW</td>
</tr>
<tr>
<td>Multi-Pollutant AQCS</td>
<td>60 GW</td>
</tr>
<tr>
<td>2017 EPS Market Share</td>
<td>2 GW</td>
</tr>
</tbody>
</table>

• EPA puts the annual industry cost of compliance for power generators at $9.6 billion.
• Industry analysts estimate compliance cost of $50 - $70 billion over next decade.
• 50 – 70 GW are at risk of retirement because of regulations, heat rate or age of unit.
• EPA estimates 60% of affected units meet some part of rules while 40% of affected units do not have advanced emissions controls installed.

Initial Target Client Profile
- Fuel: Fossil (Coal, Natural Gas, Oil, Biofuel and Waste Energy)
- Retrofit applications for generation capacity of less than 300 MW (Initial 3-5 years)
- Investor Owned Utilities, Independent Power Generators, Electric Cooperatives, Publicly Owner Utilities and District Heating/Campus.

Source: SNL Energy, ICF International, The Brattle Group, Edison Electric Institute, NERC, EPA NEEDS Database, EPS Internal Analyses
COMPLY 2000™ is the solution to meet existing air quality regulations with minimal downtime and plant integration.

**Key Advantages**

**“Cold End” Location**

**Scale-Up by Modularity**

25 MW (60,000 SCFM/ 28.3 N m³/sec)

75 MW (180,000 SCFM/ 85.0 N m³/sec)

**Speed to Market**

Project Engineering Design (9 months)

Equipment PID Fabrication (6 months)

Equipment Delivery (7 months)

Equipment Installation Phase (10 months)

Start-up, testing & commissioning (2 months)

**Cost Advantage**

Traditional AOG-5 (R&D + IQC + FCO)

COMPLY 2000™
**PRODUCT INTEGRATION— "COLD END"**

COMPLY 2000™ fully integrates into current plant operations downstream of primary particulate collection device.

**Avoided Costs**: No modifications to boiler and/or ‘hot flue gas’ equipment.

**Preserved Flyash Treatment**: No flyash impact thereby preserving current disposal options and revenue streams.

**Integration Advantage**: Cold application means less gas volume translating to compact footprint.
COMPLY UNIT LAYOUT DIAGRAM

Straightforward and functional design allows for ease of operation and maintenance of COMPLY units.

1. First & Second Stage fogging arrays
2. Inconel 686 Alloy Lining
3. CPVC Media Section
4. Inconel 625 Demister
5. Activate Carbon Filter
Modular design philosophy provides for short cycle times and scale up capabilities.

- Proven Scale up
- Short Cycle time (Fabrication thru Installation)
- Operational flexibility- Maximum integration potential for retrofit applications
- Shop assembled module units of 25 MW (projects up to 100 MW)
- Field erected module units for projects > 100 MW.
The COMPLY 2000™ process is a closed-loop process that is reliable, flexible and effective.

- **Flue Gas Stream:**
  - High Concentration of Criteria Pollutants

- **Chemical Reagent Feed:**
  - Ozone (O3) – Upstream
  - Oxidation of Pollutants to Water Soluble Compounds
  - High Pressure Fogging Array
  - Hydrogen Peroxide (H2O2)

- **Waste Water Treatment:**
  - Minimal Water Consumption (ZLD)
  - Filter Waste Water
  - Dispose of Solid Waste Material to Landfill

- **Pollutant Neutralization:**
  - Waste Water Neutralization
  - Sellable Acid by-product

- **Emissions Controls - Condensing:**
  - Pollutants Condensed from Flue Gas Stream
  - > 95% Reduction in (Hg, PM 10 & PM 2.5, Heavy Metals, Halogens and other NOx, SOx, VOC)
  - 30% to 50% Reduction in CO2 (Non CCS)
State-of-the-art facility opened in June 2010 to demonstrate the advanced multi-pollutant emission control capabilities of the COMPLY 2000™

- Began Operation – June, 2010
- Coal Fired – (1.5 MW) operating
- Natural Gas Units – (2 MW) operating
- 15,000 SCFM (7.1 N m³/sec)

- Eastern Bituminous Coal (2.2% Sulfur)
- Flue Gas Analysis
- Real time Emission Monitoring
- Sorbent Trap testing for Hg removal

- Proprietary Systems
- Ozone Generator
- Hydrogen Peroxide
- Waste Water Treatment

- Third party engineering validates technical performance and life-cycle market readiness.
- Component testing validates the design and confirms no mechanical degradation.
- EPRI confirmation of commercial readiness.
As demonstrated at Eco Power Technology Center Firing Eastern Bituminous Coal.

**PROVEN PERFORMANCE:** COAL FIRED

As demonstrated at Eco Power Technology Center Firing Eastern Bituminous Coal.

--

SO2 Removal %
- Average Removal = 99.70%

NOx Removal %
- Average Removal = 99.47%

CO2 Removal %
- Average Removal = 61.26%

Operating Conditions (7/13/2012)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Inlet (ppm)</th>
<th>Outlet (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOx</td>
<td>42.33 (ppm)</td>
<td>0.18 (ppm)</td>
</tr>
<tr>
<td>SO2</td>
<td>301.34 (ppm)</td>
<td>0.85 (ppm)</td>
</tr>
<tr>
<td>CO2</td>
<td>18,315 (ppm)</td>
<td>7,045 (ppm)</td>
</tr>
</tbody>
</table>

**Eastern Bituminous Ultimate Analysis**

- Carbon: 67.7%
- Hydrogen: 4.9%
- Nitrogen: 1.2%
- Sulfur: 3.8%
- Oxygen: 6.7%
- Ash: 9.4%
- Moisture: 6.4%

*As demonstrated July 13, 2012 - Coal*
**COMPETITIVE LANDSCAPE**

Multi-pollutants and traditional AQCS

<table>
<thead>
<tr>
<th>Company</th>
<th>Target Pollutants</th>
<th>Target Industry</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multi-Pollutant AQCS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airborne Clean Energy</td>
<td>SO$_2$, SO$_3$, NO$_x$, Hg</td>
<td>Power Generators</td>
<td>Early</td>
</tr>
<tr>
<td>Cansolv Technologies</td>
<td>SO$_2$, CO$_2$</td>
<td>Power Generators &amp; Industrials</td>
<td>Commercial Demo</td>
</tr>
<tr>
<td>CEFCO</td>
<td>SO$_x$, NO$_x$, CO$_2$, heavy metals &amp; PM2.5</td>
<td>Power Generators &amp; Industrials (Cement)</td>
<td>Early</td>
</tr>
<tr>
<td>Hamon Research Cotrell</td>
<td>SO$_x$, NO$_x$, Hg and particulate</td>
<td>Power generators, metals, cement</td>
<td>Commercial Demo</td>
</tr>
<tr>
<td>Lextran</td>
<td>SO$_x$, NO$_x$, Hg &amp; other toxic heavy metals</td>
<td>Power generators</td>
<td>Commercial Demo</td>
</tr>
<tr>
<td>Nalco Mobotec</td>
<td>NO$_x$, SO$_x$, Hg and particulate</td>
<td>Power generators &amp; industrials</td>
<td>Commercial</td>
</tr>
<tr>
<td>Neumann Systems Group</td>
<td>SO$_x$, NO$_x$, CO$_2$</td>
<td>Coal Fired Utilities</td>
<td>Commercial Demo</td>
</tr>
<tr>
<td><strong>Traditional AQCS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FGD (B&amp;W, Als, Hit, BPI, MET, HRC, Siemens, Advatech)</td>
<td>SO$_2$</td>
<td>Power Generators/Industrials</td>
<td>Commercial</td>
</tr>
<tr>
<td>SCR (B&amp;W, Als, BPI, Hit, FW)</td>
<td>NO$_x$</td>
<td>Power Generators/Industrials</td>
<td>Commercial</td>
</tr>
<tr>
<td>Sorbent Inject (Numerous)</td>
<td>Hg, SO$_2$ and SO$_3$</td>
<td>Power Generators/Industrials</td>
<td>Commercial</td>
</tr>
<tr>
<td>ESP (Alstom, Siemens, Hitachi, et. al.)</td>
<td>Particulate Control</td>
<td>Power Generators/Industrials</td>
<td>Commercial</td>
</tr>
<tr>
<td>Fabric Filter (B&amp;W, Alstom, Siemens, Hamon, Hitachi)</td>
<td>Particulate Control</td>
<td>Power Generators/Industrials</td>
<td>Commercial</td>
</tr>
</tbody>
</table>

**EPS competitive advantage on total levelized cost basis for multi-pollutants addressed**

**EPS has demonstrated performance at for 2+ years**

Source: Edison Electric Institute, EPRI, EPS Internal Analyses
The COMPLY 2000™ system offers the most attractive compliance cost/performance value on a true multi-pollutant $/MPTon* basis.

ECONOMIC COMPARISON—ECO POWER VS. TRADITIONAL OPTIONS

The COMPLY 2000™ system is economically more attractive than traditional AQCS technologies on CAPEX and OPEX and controls/reduces a broader range of regulated and unregulated pollutants.

Source: Credit Suisse: Impact of EPA Rules on Power Markets, Bernstein Research, Midlothian Associates, EPRI, EPS Internal Analyses
TACTICAL TEAMING - SALES & PROJECT EXECUTION
Engineering, Procurement, Construction firms targeted for project execution.

Technology Provider
• OEM multi-pollutant technology & core balance of plant

Constructor
• Project construction or installation services

Plant Integrator and Designer
• Project engineering, balance of plant integration and supply

Bankable approach and execution team to mitigate risks and deliver project on-time, on-budget and to-contract.
The COMPLY 2000™ technology has the ability to accomplish multi-pollutant (SO2, SO3, NOx, Hg, halogens and residual particulate matter) removal at very high efficiencies in a single absorber vessel. The economic analysis of the COMPLY 2000 system indicates that the system has a lower capital cost and fixed operating costs than the combination of traditional air quality control systems that would be required to achieve similar performance.

Eco Power Solutions is dedicated to the ongoing development of advanced, clean energy technologies.

Company

- Privately Held - Headquartered in Boston, Massachusetts
- Original Equipment Manufacturer (OEM) of patented air quality control system (AQCS) technology
- Engineering and R&D operations in Louisville, KY
- Experienced management team

Market

- Power Generation (Coal, Natural Gas, Oil, Biomass, and Municipal Waste) – U.S. Coal 330 GW
- Heavy Industrials (Steel & Aluminum, Glass & Cement, Paper & Pulp, Petro Chemical) – U.S. 45 GW
- Heavy Commercial (Hospitals & Universities) – U.S. 30 GW

Proven Technology

- COMPLY 2000™ – Advanced ‘all-in-one’ Multi-Pollutant control product
- High multi-pollutant removal rates (Hg, PM2.5, CO2, NOx, SOx, HCl, and other heavy metals)
- 5 MW units (Coal & Gas) operating since June 2010
- Performance & economics validated by multiple 3rd parties including EPRI and URS

Strong Value Proposition

- Lowest Levelized Cost solution on the market today for widest spectrum of pollutants removed
- Smaller footprint, shop-assembled modules, and shortest cycle time from engineering to operation
- Applicable to all fossil fuels and Waste from Energy fuel stock
- Ideal for retrofit and new build applications
- Potential expansion of primary fuel options for owner
- Downstream byproduct revenue stream
Leading the way in Environmental & Energy Reliability

www.ecopowersolutions.com
twitter.com/makingcoalclean
linkedin.com/company/eco-power-solutions