PRACTICAL CO2 AND MERCURY CAPTURE
achieved FOR COAL-FIRED POWER PLANTS

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Hammond, IN – Jupiter Oxygen Corporation and the United States Department of Energy have a new, critical technology break-through so that CO2 capture and mercury removal can be done by coal fired power plants.

Jupiter Oxygen Corporation and the Albany Research Center of the Department of Energy today demonstrated a practical and cost-effective method for the capture of CO2 and mercury for coal-fired power plants, as well as to remove other pollutants and use less fuel so that coal-fired power plants can be more efficient and only have ultra-low emissions at the same electricity cost as for natural gas plants. This means that our nation's abundant coal supply can be used in an environmentally friendly way, now and in the future. The use of this clean, efficient, and innovative combustion and pollution prevention process with coal can provide both improved national energy independence and security, and a stable energy supply to support economic growth.

Using Jupiter Oxygen's patented oxy-fuel combustion technology with the Integrated Pollutant Removal (IPR) system developed by the Albany Research Center, the testing showed an combustion level for NOx of only .088 [well below the goal of .100 without any back-end emission control technology], capture of more than 80 % of the CO2 at a pressure which shows that at least 95% can be captured, 60%-90% of the mercury (range due to test measurement limitations), more than 99% of S0x, more than 99% of all particulates, and more than 80% of the small particles (PM 2.5), thereby preventing the greenhouse gases, mercury and particles from being released into the atmosphere in any significant amounts.

Working under a CRADA agreement, Jupiter Oxygen and the Albany Research Center designed, built and operated a 75 KWh power generating test unit to determine the practicality of operating coal-fired power plants coupling Jupiter Oxygen's patented oxy-fuel combustion technology with the ARC-developed Integrated Pollutant Removal (IPR) system. Combined with previous test data, thermal analysis and computer modeling, the results demonstrate a presently practical way to economically generate electrical power coal with ultra-low emissions and increased boiler efficiency meaning less fuel usage.

The test used pure oxygen for combustion while excluding air which contains nitrogen. This reduces exhaust gases while concentrating CO2 and mercury as well as other pollutants for efficient capture with ultra-low NOx production.

Reducing exhaust mass flow and nitrogen while increasing radiant heat are important keys for these improvements. Future, larger-scale power plant systems may vary flue-gas recirculation rates to add flexibility to new boiler designs using Jupiter Oxygen's technology, so new boilers can be 60% of the size and cost of traditional boilers.

Jupiter Oxygen's combustion technology is commercially proven in manufacturing, and now is now emerging as the most promising technology for use in coal-fired power plants. While no single solution will be found for our Nation's energy supply problems; it is advanced concepts such as Jupiter's oxy-fuel combustion and Albany Research's IPR technology that will give the energy sector a selection of solutions for environmentally sound energy production. With the completion of this first test unit and its subsequent successful operation, it has now been proven that previous modeling of the system was correct, and that system concepts are both technically feasible and practical on an economic basis.

This test unit, powered by Jupiter Oxygen 75 KWh oxy-fuel combustion technology, which burns about 30 pounds of pulverized coal per hour, previously was modeled at the Albany Research Center. The fundamental concepts are that oxygen, rather than air, and augmented with flue gases recirculated from the boiler exhaust, is used to support the firing of fuel in a power plant boiler. The compositions of the combustion gas and outgoing exhaust are markedly different from those found in air-supported combustion. One benefit of this difference in composition is that the exhaust gas is far easier to clean.

With the successful conclusion of this initial test unit experiment which more than met expectations, Jupiter Oxygen and the Albany Research Center of the DOE are ready to tackle the next phase of this endeavor, which also will include the National Energy Technology Laboratory of the DOE. Two small operating power plants will be required to provide the remaining engineering and operating data necessary for full-size power plant design, construction, and operation. Specifically, a 20 MW conventional coal-fired power plant should be retrofit, and a new 25 MW power plant should be designed to fully utilize the efficiencies and other advantages of these technologies, as well as constructed and operated to demonstrate these technologies for commercial use by coal-fired power plants and consideration by the Environmental Protection Agency. It is hoped that both power plants will be operational by 2007.

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