

## **ClearSign Achieves Major Milestone: 2PPM NOx Demonstrated** **Company meets aggressive 2013 milestone, dropping NOx a further 33% to 2PPM.** **Sets new 2013 goal of 1PPM or lower.**

SEATTLE, Sept. 11, 2013 /PRNewswire/ -- ClearSign Combustion Corporation (NASDAQ: CLIR) today announced that it has measured and documented a *further 33% reduction* in emissions of Nitrous Oxides (NOx), now down to 2 parts per million (PPM) from its previous record of 3 PPM announced in June. This marks a major milestone in the development of ClearSign's Duplex™ Burner Architecture, and marks the early achievement of an aggressive 2013 target for the company.

The announcement occurred during a live web conference yesterday, attended by members of the media and potential partners and customers. A roundtable of subject matter experts provided context and discussed the market implications of the achievement. The panel included current and former managers and leading researchers at Marathon Petroleum Corporation, Chevron Corporation, The Energy Solutions Center and the University of California, Berkeley.

The web conference has been archived and is available for [viewing here](#), or by visiting [clearsign.com](http://clearsign.com)

"Earlier this year, we set what we believed was an aggressive goal of achieving 2 PPM of NOx by the end of 2013, using a combination of ClearSign's Electrodynamic Combustion Control™ (ECC™) and our Duplex™ Burner Architecture technologies," said ClearSign CEO, Rick Rutkowski. "Today, I am extremely proud to report that we have not only achieved this important objective but, thanks to the efforts of our development team, made it happen much earlier than we anticipated. We plan to continue our efforts and have set a new stretch goal of dropping NOx by a further 50% to 1PPM or lower by the end of this year."

Richard Biljetina, Director, Industrial Markets at the Energy Solutions Center provided context and noted, "The important thing to understand is just how difficult it is to get below 10 or 15 PPM [of NOx]. Current solutions such as FGR [Flue Gas Recirculation] have very high efficiency penalties and SCR [Selective Catalytic Reduction] has very high cost penalties. So at ESC, what we are looking for, for our customers, are burners that do the job in the burner itself using techniques such as internal recirculation, or exactly the type of things you're hearing about from ClearSign. Because truly, if we can achieve 2 PPM without any efficiency penalties at very reasonable cost, that would be a extremely great accomplishment."

Rutkowski added, "The use of conventional Low NOx and Ultra Low NOx burners has typically involved significant costs to owners not only in the form of capital and construction costs but in the form of penalties to energy efficiency and process throughput and even maintenance costs. Moreover, these increased costs become more severe as lower levels of NOx emissions are pursued. Energy efficiency is reduced by requirements for supplemental FGR and increased O2 levels and by constraints to operating range (turndown). By contrast, we believe ClearSign's Duplex Burner technology promises to reverse this trend by potentially eliminating these requirements and removing the constraint to operating range."

Dr. Michael Frenklach, professor of Mechanical Engineering at the University of California, Berkeley, commenting on today's announcement, offered, "I'm very impressed by your results. Not only are you bringing NO down, but you are maintaining CO [at low levels] as well. This needs to be studied much more. This is an important accomplishment. I think that accomplishing this... may offer independent control of NOx from other pollutants, for example hydrocarbons... this would be a major step forward."

Filtration+Separation magazine estimates in its April 2013 issue that the market for NOx control technology will be \$11 billion in 2014, of which non-utility [commercial and industrial boiler applications] will comprise over \$2 billion annually. Reporting in the American Society of Mechanical Engineers, the McIlvaine Company projects double-digit growth in this market, placing NOx control at #4 on its list of the top ten most promising growth markets in energy, air and water.

### **About ClearSign Combustion Corporation**

ClearSign Combustion Corporation designs and develops technologies that aim to improve key performance characteristics of combustion systems including energy efficiency, emissions control, fuel flexibility and overall cost effectiveness. Our Electrodynamic Combustion Control™ (ECC™) platform technology improves control of flame shape and heat transfer and optimizes the complex chemical reactions that occur during combustion in order to minimize harmful emissions. For more information about the Company, please visit [www.clearsign.com](http://www.clearsign.com)

### **Cautionary note on forward-looking statements**

This press release includes forward-looking information and statements within the meaning of the Private

Securities Litigation Reform Act of 1995 and the provisions of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Except for historical information contained in this release, statements in this release may constitute forward-looking statements regarding our assumptions, projections, expectations, targets, intentions or beliefs about future events that are based on management's belief, as well as assumptions made by, and information currently available to, management. While we believe that our expectations are based upon reasonable assumptions, there can be no assurances that our goals and strategy will be realized. Numerous factors, including risks and uncertainties, may affect our actual results and may cause results to differ materially from those expressed in forward-looking statements made by us or on our behalf. Some of these factors include the acceptance of existing and future products, the impact of competitive products and pricing, general business and economic conditions, and other factors detailed in our Quarterly Report on Form 10-Q and other periodic reports filed with the SEC. We specifically disclaim any obligation to update or revise any forward-looking statement whether as a result of new information, future developments or otherwise.

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