CEFCO GLOBAL CLEAN ENERGY, LLC

McIlvaine Company Hot Topic Hour on
"Utility MACT - Impact and
Compliance Strategy"

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CEFCO

The Problem

- EPA's new Rules and Standards of Maximum Achievable Control Technology ("MACT") and NESHAP address Targeted Pollutants and $PM_{2.5}$ in the **Utility Power Industries**:
- Current Best Available Control Technology ("BACT") individually captures between 50-90% of air pollutants at great capital and operating costs
- Conventional BACT users must combine multiple overlapping technologies to come close to 99+% multi-pollutant and carbon capture
    - Cannot make valuable and sellable End-Products

CEFCO's Solution

- Use Ewan's supersonic shockwave "free-jet collision scrubbing" (recognized by EPA/DOE) to capture all pollutants, including CO_2

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- Cooper Process to convert all "captured pollutants" into recovered, valuable, and sellable End-Products

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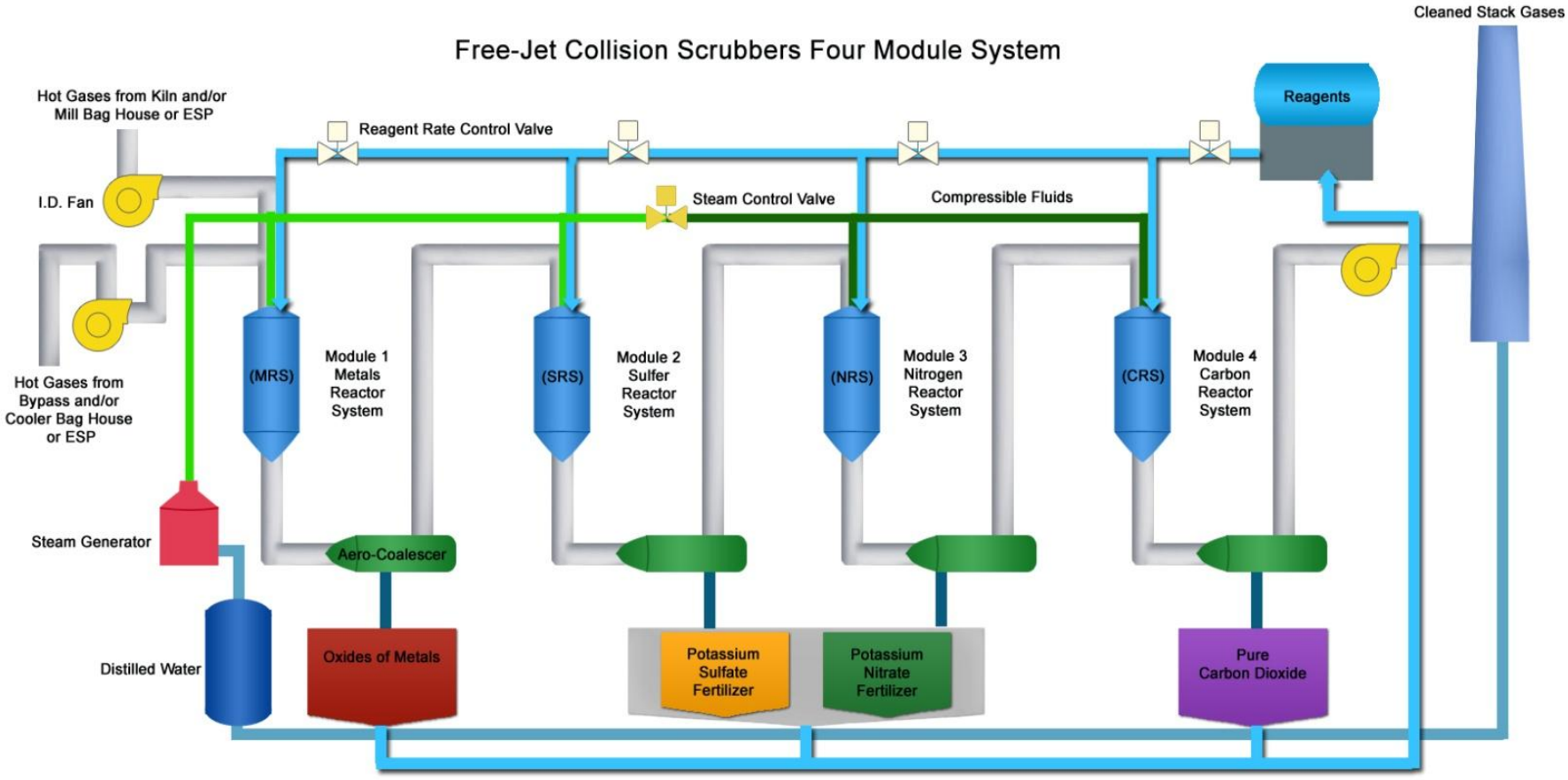
- USPTO Patent Issued on November 30, 2010 under: **7,842,264**
- CEFCO Users:
  - 1) Comply with all EPA's MACT and HAP Requirements
  - 2) Economic Benefit of selling End-Products ***– no longer "cost-center"***

Technology Flow Diagram



The CEFCO Process uses a comprehensive re-circulating and re-generating system that optimizes the conservation of water, energy, and all required inputs

CEFCO Process Uses Supersonic Shockwave

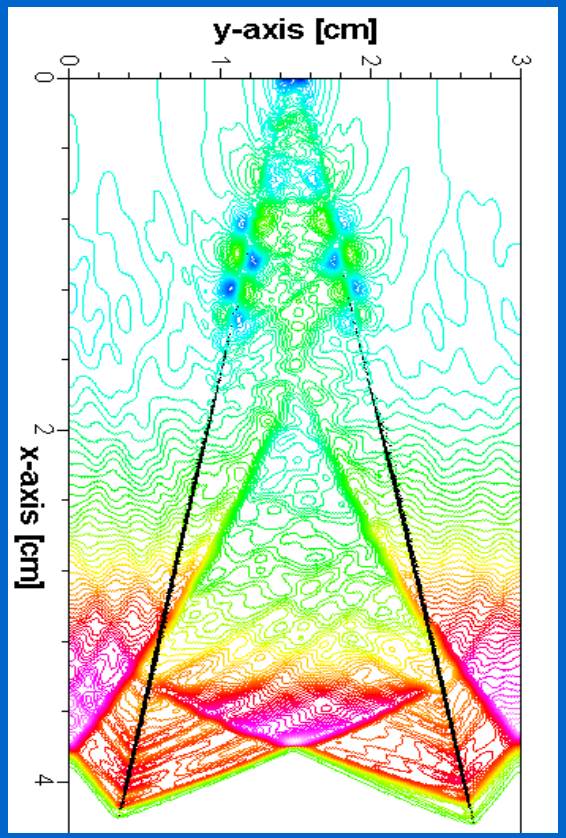


Image: Beginning to form supersonic shockwave at Mach 1.0 and will move into much higher Machs attacking the flue gas in the CEFCO Reactors System

- Free-jet collision of gas molecules with select-reagent is formed throughout each reactive zone
- Propelling steam or compressible fluid to desired supersonic speeds to generate multiple intense shockwaves of energy and pressure
- 5 Scientific parameters are: Time, Velocity, Temperature, Pressure and pH

Shockwave-Induced Intimate Mixing

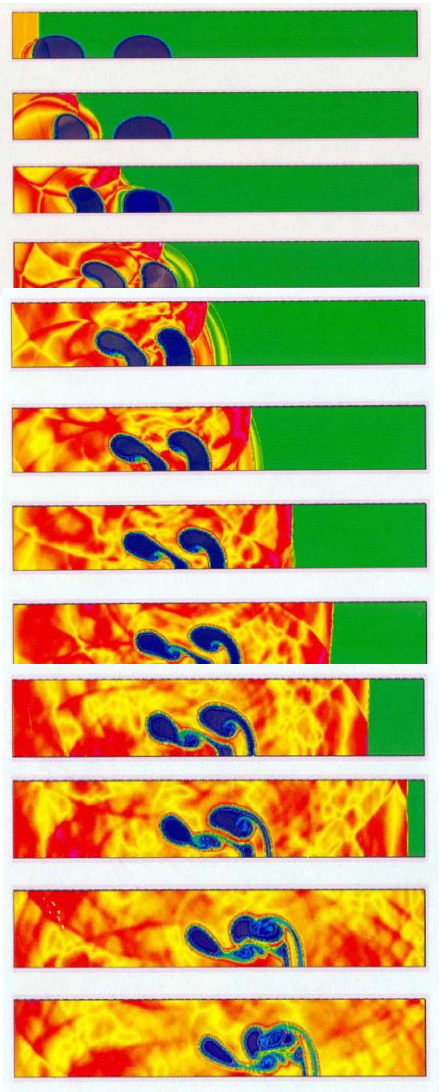
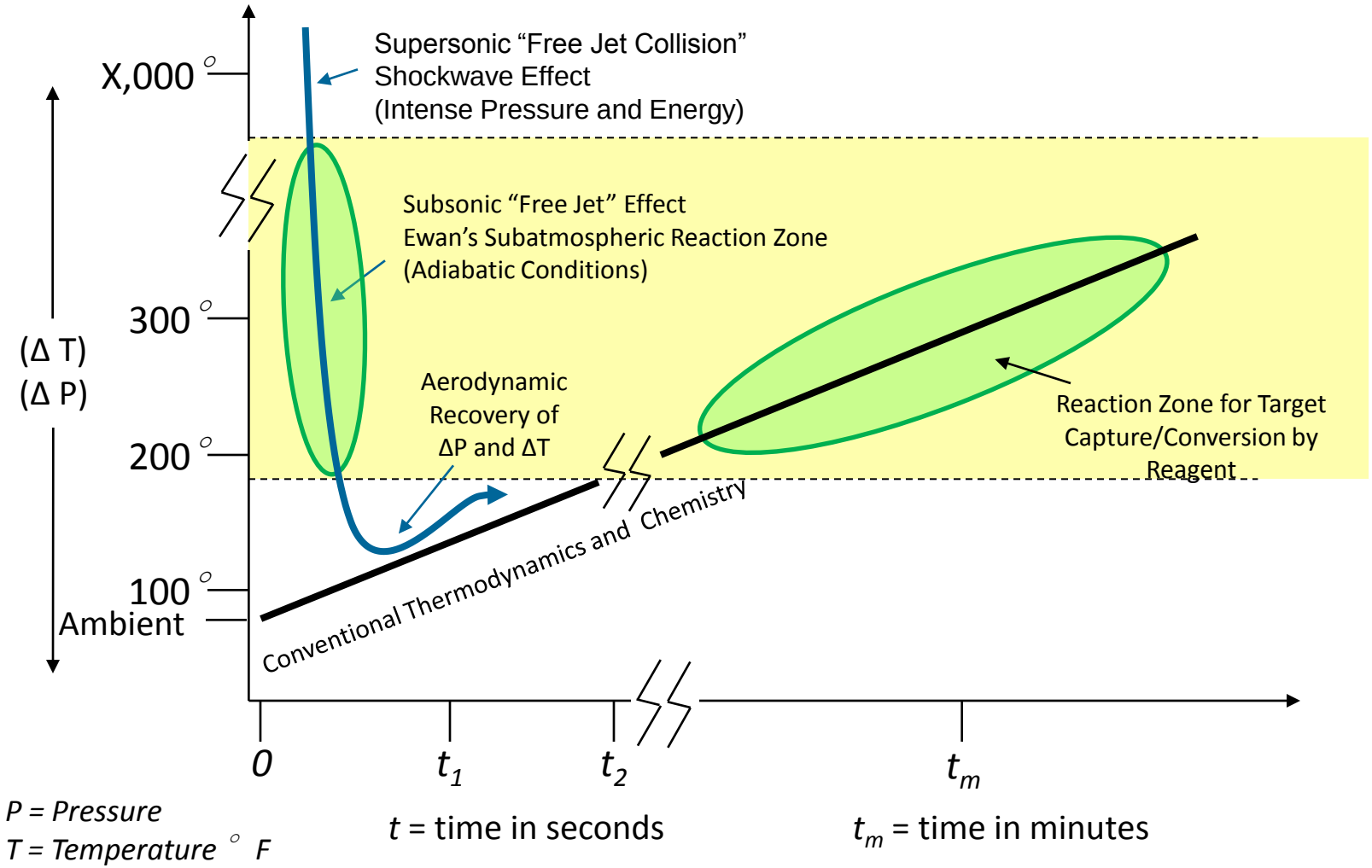


Image: Schlieren Photography showing shockwave-induced intimate inter-mixing of two gas-phase molecules within split-seconds

Comparison of Parasitic Load or Energy Penalty



The CEFCO Advantage: Faster and Cheaper

COST CONSIDERATIONS FOR A TYPICAL 1,000 MW PLANT FOR ALL POLLUTANTS AND CO_2 CAPTURE MODULES		
	Current AQCS Technology*	**CEFCO Process**
Capital Cost	• Multiple pollutant -specific technologies required • Est. CAPEX ~$1.5 to $2.0B;	• Single integrated technology to treat all pollutants and CO_2 • 50% less CAPEX • 50% less space (~150ft in length), stackable / modular configurations
Operating Cost	• Significant energy required for pollutant capture & recovery • Total system shutdown required for periodic maintenance and repair	• Utilizes spent steam and re-circulating reagents for increased efficiency and cost-savings • No downtime for maintenance with parallel modules
Parasitic Load	• 30%-60% • Efficiency degrades over operational use and time	• < 10% • Maintains high efficiency throughout

**Current AQCS Technology refers to all technologies in the marketplace from many sources*

Recent New Articles:

Power Engineering International:

"Ewan and Cooper Processes Unite in 'Paradigm Shifting' Patent"

November 2010 issue

Modern Power Systems:

"Sending Shockwaves Through the Multi-Pollutant Control Business"

October 2010 issues

Power Engineering:

"Patent Rights Will Soon be Available for Novel Emission Control Process"

11 August 2009

"Supersonic Emissions Control"

January 2009 issue

Upcoming Market Segments

CEFCO is looking for experienced and qualified engineering product or service providers to become our distributors in the following market segments (or distribution channels) for:

- Utility MACT Compliance
- Boiler MACT Compliance
- Pulp & Paper MACT Compliance
- HWC MACT Compliance

CEFCO has already appointed licensed distributorship for the Cement and Lime Industries in USA, Canada, and Mexico for Cement MACT Compliance.

Please visit our Website at: **www.cefcoglobal.com**

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