

THE CALLIDUS® ULTRA BLUE® BURNER SYSTEM ENABLING ENERGY TRANSITIONS WITH BREAKTHROUGH LOW NO_x EMISSIONS

The Ultra Blue® System Equipment | Licensed Process Control Technologies | Targeted De-NO_x Gas Injection, TDGi™

WEDNESDAY, OCTOBER 4, 2023 • 12:00 PM +08
9:30AM MUMBAI / 12PM SINGAPORE / 1PM TOKYO

WEDNESDAY, OCTOBER 4, 2023 • 10:00 AM BST
10AM LONDON / 1PM DUBAI / 2:30PM MUMBAI

WEDNESDAY, OCTOBER 4, 2023 • 12:00 PM CDT
10AM LOS ANGELES / 12PM HOUSTON / 1PM NEW YORK

KURT KRAUS
PRINCIPAL COMBUSTION TECHNOLOGIST

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PROVEN FOR IMPACT FOR THE ENERGY TRANSITION

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FORWARD LOOKING STATEMENTS

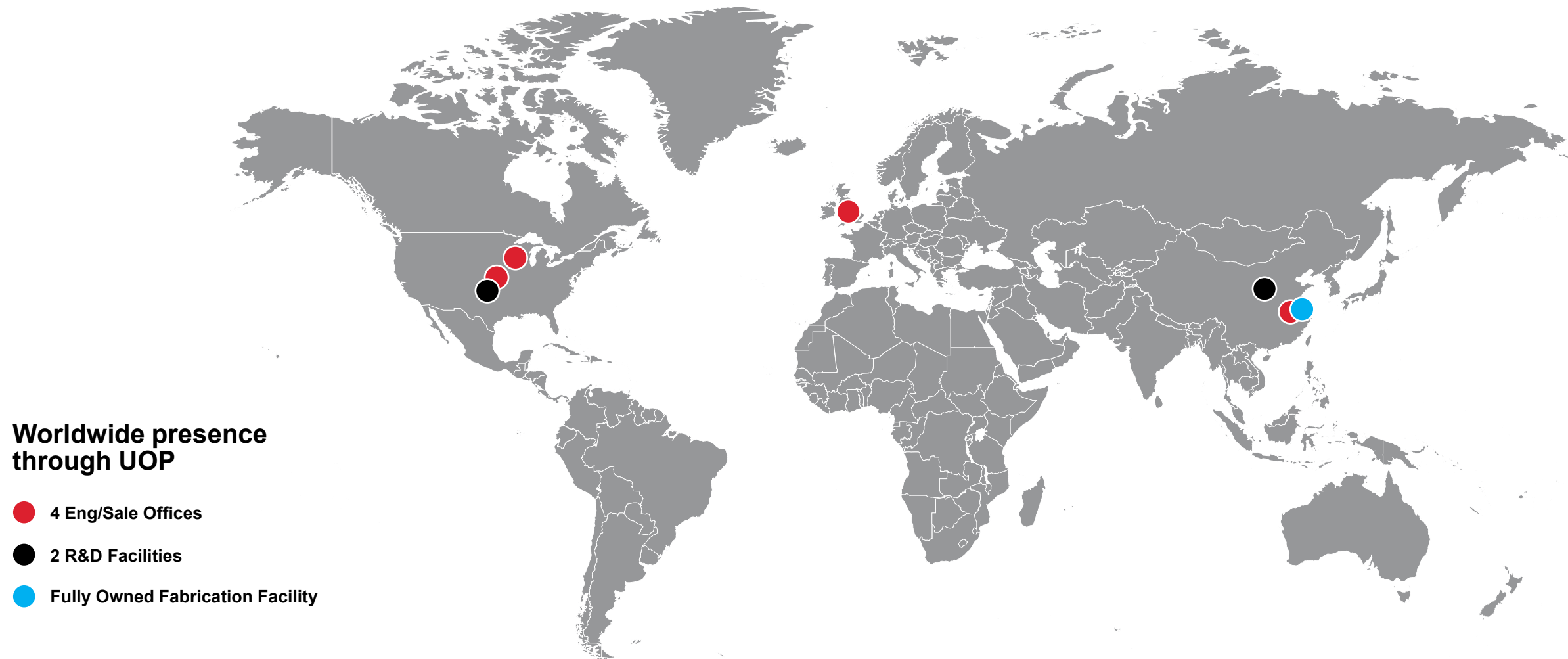
This presentation contains certain statements that may be deemed “forward-looking statements” within the meaning of Section 21E of the Securities Exchange Act of 1934. All statements, other than statements of historical fact, that address activities, events or developments that we or our management intends, expects, projects, believes or anticipates will or may occur in the future are forward-looking statements. Such statements are based upon certain assumptions and assessments made by our management in light of their experience and their perception of historical trends, current economic and industry conditions, expected future developments and other factors they believe to be appropriate. The forward-looking statements included in this presentation are also subject to a number of material risks and uncertainties, including but not limited to economic, competitive, governmental, technological, and COVID-19 public health factors affecting our operations, markets, products, services and prices. Such forward-looking statements are not guarantees of future performance, and actual results, and other developments, including the potential impact of the COVID-19 pandemic, and business decisions may differ from those envisaged by such forward-looking statements. Any forward-looking plans described herein are not final and may be modified or abandoned at any time. We identify the principal risks and uncertainties that affect our performance in our Form 10-K and other filings with the Securities and Exchange Commission.



PROVEN INNOVATION FOR THE ENERGY TRANSITION

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Worldwide presence
through UOP

- 6 Eng/Sale Offices
- 3 R&D Facilities
- Fully Owned Fabrication Facility



THE ULTRA BLUE SYSTEM WITH CALLIDUS® BREAKTHROUGH LOW NO_x BURNERS

Energy transition – 100% Hydrogen firing

- Flexibly transition between high-hydrogen firing and conventional plant fuels¹
- Rapid, on-demand fuel switching

Breakthrough lower NO_x emissions

- Over 50% reduction in NO_x¹
- Compared to conventional ultra-low NO_x burners
- Eliminate or reduce CAPX/OPEX for SCRs

Efficient Energy Transition & Lower Emissions

- Breakthrough low NO_x on virtually any fuel gas
- Can deliver the lowest NO_x emissions when 100% hydrogen firing¹
- Enables Carbon Capture Technologies

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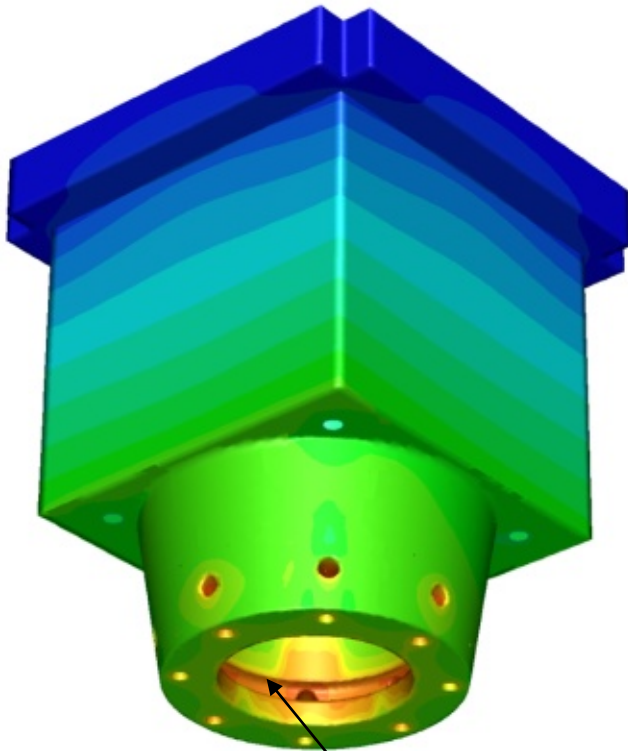
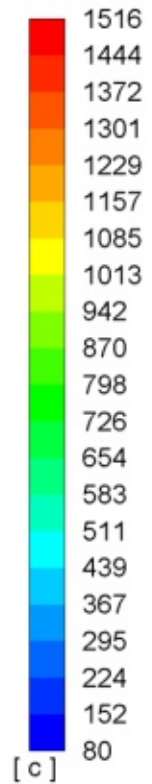
¹ Based on the results of Callidus' June 2022 Test Report for CUBH and CUBP Process Heater Burners available at:
<https://uop.honeywell.com/en/equipment-and-aftermarket-services/callidus-environmental-combustion-technology/callidus-burners/callidus-ultra-blue-petrochemical-cubp-burners>

Ready for Energy Transition and Even More Stringent Emissions Regulations

HYDROGEN OPTIMIZED BURNER TILE TEMPERATURE – REFINERY FUEL GAS/ H2 OFF GAS

CUBL Burner Tile

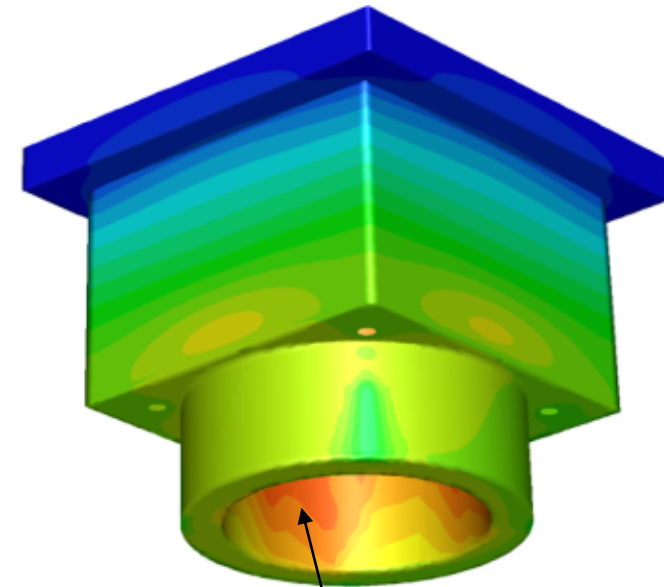
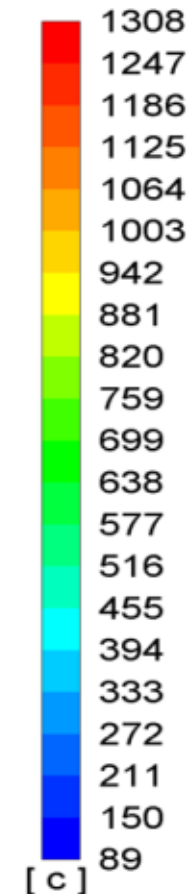
Wall Temperat



The maximum temperature(1516°C) occurs around these small holes.

CUBH Burner Tile

Wall Temp



The maximum temperature(1181°C) occurs on the solid wall.

THE ULTRA BLUE SYSTEM WITH CALLIDUS® ULTRA BLUE HYDROGEN - CUBH LOW NO_x BURNERS

Rapidly Switch From/To Any Fuel

- 100% Hydrogen Fuel Gas
- 100% Natural Gas Fuel
- CO₂ Rich and CO₂ Lean Purge Gas
- 0% to 100% Purge Gas Fuel
- High or Low Design Pressure
- Premixed or Separate Fuel & Purge Gas
- High 2 Barg or Low 0.2 Barg Design Fuel Pressure

**Consistent Low NO_x Emissions Across All Fuels³
No Special Operator Intervention on Fuel Change
Normal Furnace Excess Air and Draft Control**

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Ready for Energy Transition and Even More Stringent Emissions Regulations

THE ULTRA BLUE SYSTEM **CALLIDUS® CUBP Burners with Targeted De-No_x Gas injection TDGi™**

Energy transition – 100% Hydrogen firing

- Flexibly transition between high-hydrogen firing and conventional plant fuels¹
- Rapid, on-demand fuel switching

Breakthrough lower NO_x emissions

- Over 50% reduction in NO_x¹
- Compared to conventional ultra-low NO_x burners
- Eliminate or reduce CAPX/OPEX for SCRs

Efficient Energy Transition & Lower Emissions

- Breakthrough low NO_x on virtually any fuel gas
- Can deliver the lowest NO_x emissions when 100% hydrogen firing¹
- Enables Carbon Capture Technologies

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Ready for Energy Transition and Even More Stringent Emissions Regulations

FULLY DEVELOPED: THE ULTRA BLUE SYSTEM APPLICATIONS **BRING US YOUR APPLICATIONS AND WE WILL SHOW YOU HOW THEY CAN WORK**



Steam Crackers
100% Hydrogen Firing
Sub-25ppm NO_x¹



Process Heaters
100% Hydrogen Firing
Sub-5ppm NO_x¹



Radiant Wall SMR
100% Hydrogen Firing
Sub-5ppm NO_x¹



Down-Fired SMR
100% Hydrogen Firing
Sub-10ppm NO_x¹

Multiple Multi-Burner Heaters in Various Configurations Developed, Fielded and Ready

THE PROVEN CALLIDUS® ULTRA BLUE® FAMILY OF LOW NO_x BURNERS

	CUBL	CUBH	CUBP
Ultra-Low NO _x Performance Sub-10ppm NO _x for many refinery cases ¹	✓	✓	
Breakthrough Low NO _x Performance Single Digit ppm NO _x for many refinery cases ¹			✓
Flexible Fuels: 100% H ₂ to 100% Hydrocarbons and Virtually Any Synthesized or Refinery Fuel Gas ¹	✓	✓	✓
Optimized for 100% Hydrogen Service ¹		✓	✓
Bolt-On Retrofittable / Upgradable	✓	✓	✓
Conventional Burner Operation	✓	✓	✓
with The Ultra Blue System			✓

CUBL

Callidus® Ultra-Blue Low NO_x Burner

The Industry Standard Low NO_x Workhorse

CUBH

Callidus® Ultra-Blue Hydrogen Burner

Optimized for Hydrogen Fuel Service Proprietary
Flame Stabilization Technology

CUBP

Callidus® Ultra-Blue System Burner

Optimized for Hydrogen Fuel Service Proprietary
Flame Stabilization Technology
Breakthrough Low NO_x Performance Proprietary
Targeted De-NO_x Gas Injection, TDGi™

THE ULTRA BLUE SYSTEM BREAKTHROUGH LOW NO_x PERFORMANCE



100% Natural Gas Sub-5 ppm NO_x¹



Refinery fuel gas Sub-10 ppm NO_x¹



100% Hydrogen Sub-5 ppm NO_x¹

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THE ULTRA BLUE SYSTEM BREAKTHROUGH LOW NO_x PERFORMANCE



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100% Hydrogen Sub-5 ppm NO_x¹

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THE ULTRA BLUE SYSTEM RENEWABLES: BREAKTHROUGH LOW NO_x PERFORMANCE



100% Natural Gas Sub-5 ppm NO_x¹



Synthetic (Refinery) Fuel Gas Sub-10 ppm NO_x¹



100% Hydrogen Sub-5 ppm NO_x¹

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THE ULTRA BLUE SYSTEM

NET ZERO CARBON: BREAKTHROUGH LOW NO_x PERFORMANCE



100% Natural Gas Sub-5 ppm NO_x¹



100% Hydrogen Sub-5 ppm NO_x¹



100% Hydrogen Sub-5 ppm NO_x¹

¹ Based on the results of Callidus' June 2022 Test Report for CUBH and CUBP Process Heater Burners available at: <https://uop.honeywell.com/en/equipment-and-aftermarket-services/callidus-environmental-combustion-technology/callidus-burners/callidus-ultra-blue-petrochemical-cubp-burners>

INNOVATION FOR THE ENERGY TRANSITION

The Callidus® Ultra Blue® Burners are the proven heart of the Ultra Blue® System designed to cost effectively reduce NO_x emissions while flexibly transitioning between conventional and carbon emission-reducing fuels. The System includes the simple process design, control devices, software and equipment, including best-in-class burners.

BENEFITS

- Seamless, conventional operation
- 100% Hydrocarbon to 100% Hydrogen Fuel Service
- No special operating procedures
- Breakthrough low NO_x emissions
- Ambient or preheated combustion air
- Natural, forced or balanced draft

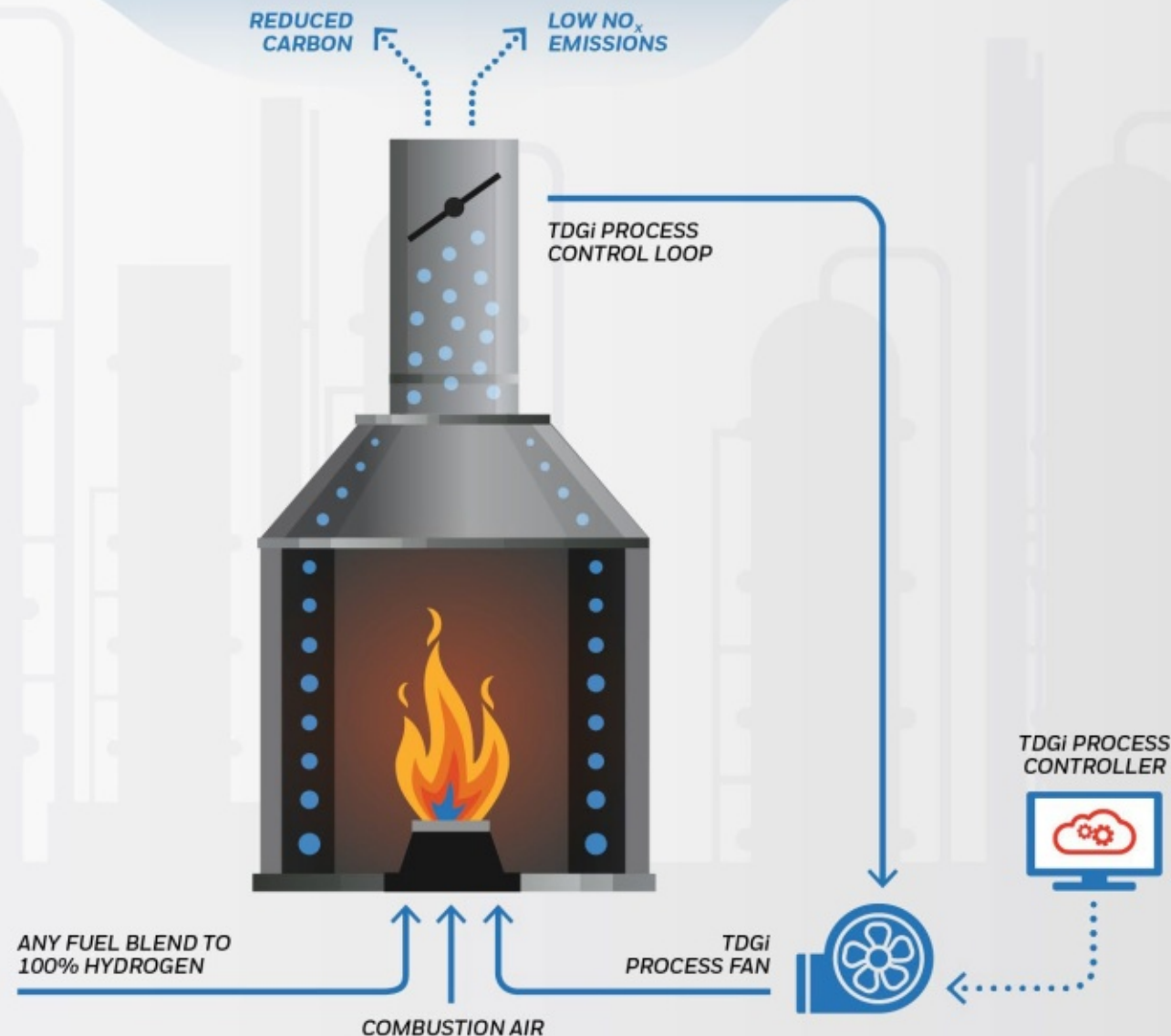
TGDi PROCESS EQUIPMENT

- Proven Callidus Ultra Blue CUBP Burners
- Delivery System Hardware
- Control Devices

Callidus Ultra Blue Burners, the Ultra Blue System and TGDi processes are protected by multiple patents and patents applied for.

Example of Using Flue Gas as the Targeted De-NO_x Gas Injection (TDGi™) Medium

The Innovative Performance Breakthrough Over Traditional External Flue Gas Recirculation for Which the Industry Has Been Searching

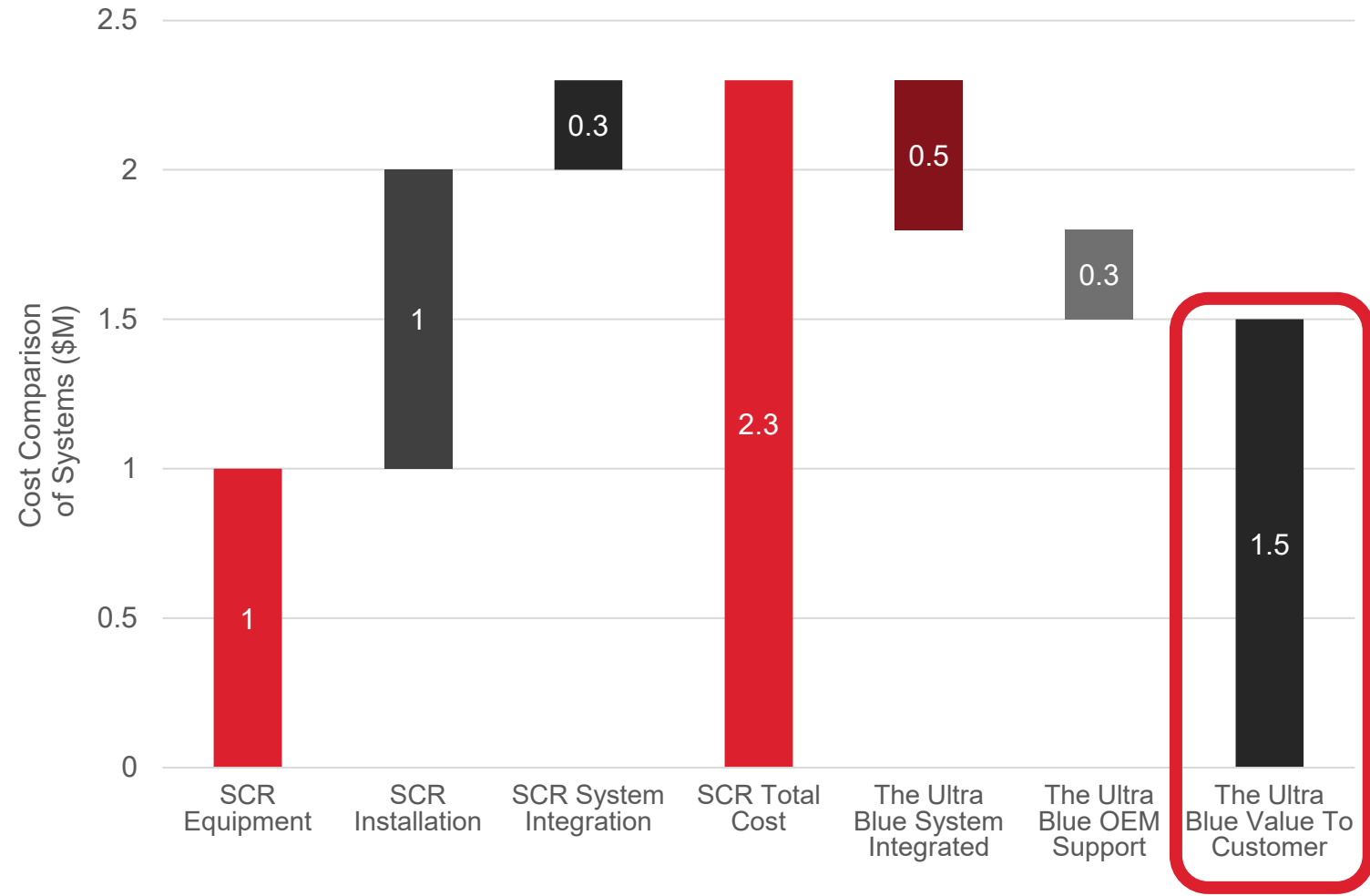


THE ULTRA BLUE SYSTEM DELIVERS CUSTOMER VALUE SCR ELIMINATION EXAMPLE

- Reduce NOX Emissions, Make New Permit
- Eliminate Cost (\$2.3M) for SCR Equipment, Installation, Integration
- Realize over \$1.5M Savings per Large furnace upfront cost
- Integrate the Ultra Blue System with CUBP Burner
- Supported by OEM
- Cash Model: No OPEX

BONUS:

- **Reversibly Transition Petrochemical Complexes and Refineries**
- **Achieve Zero Scope 1 Emission**



Drive to Zero Scope 1 Emissions with the Lowest NO_x Emissions

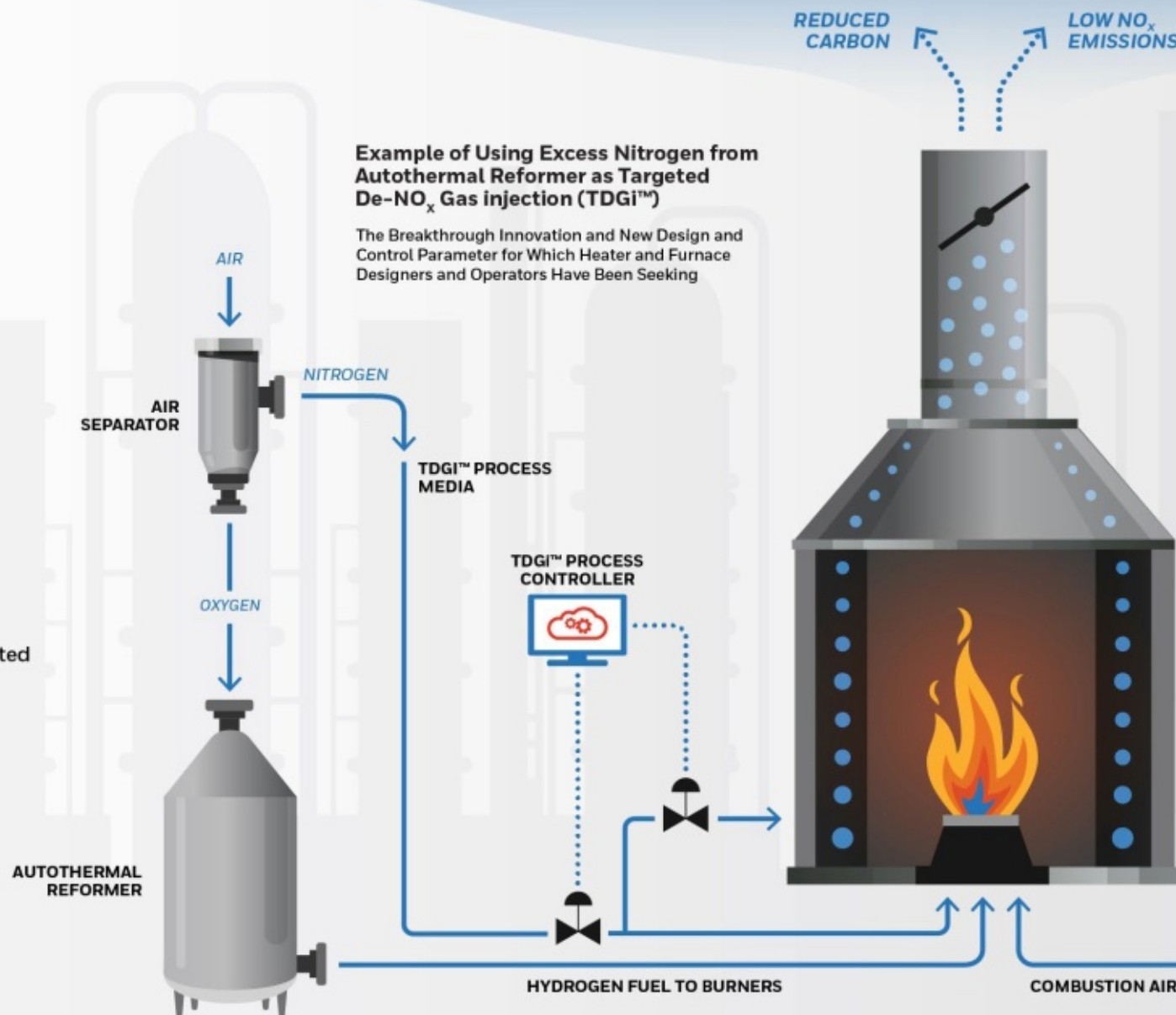
ADVANCED TECHNOLOGY TO LOWER EMISSIONS

The Callidus® Ultra Blue® Burner System, configured to effectively use wasted nitrogen from the air separation on an autothermal reformer, replaces the mass flow lost when transitioning from conventional fuels to hydrogen firing. The system reversibly transitions to low-carbon, high-hydrogen fuels, maintaining optimized heater efficiency while greatly reducing NO_x emissions.

BENEFITS

- Seamless, conventional operation
- 100% Hydrocarbon to 100% Hydrogen Fuel Service
- No special operating procedures
- Potentially increase efficiency, runtime and yield
- Breakthrough low NO_x emissions
- Ambient or preheated combustion air
- Natural, forced or balanced draft

Callidus® Ultra Blue® Burners, the Ultra Blue System and TDGI™ processes are protected by multiple patents and patents applied for.

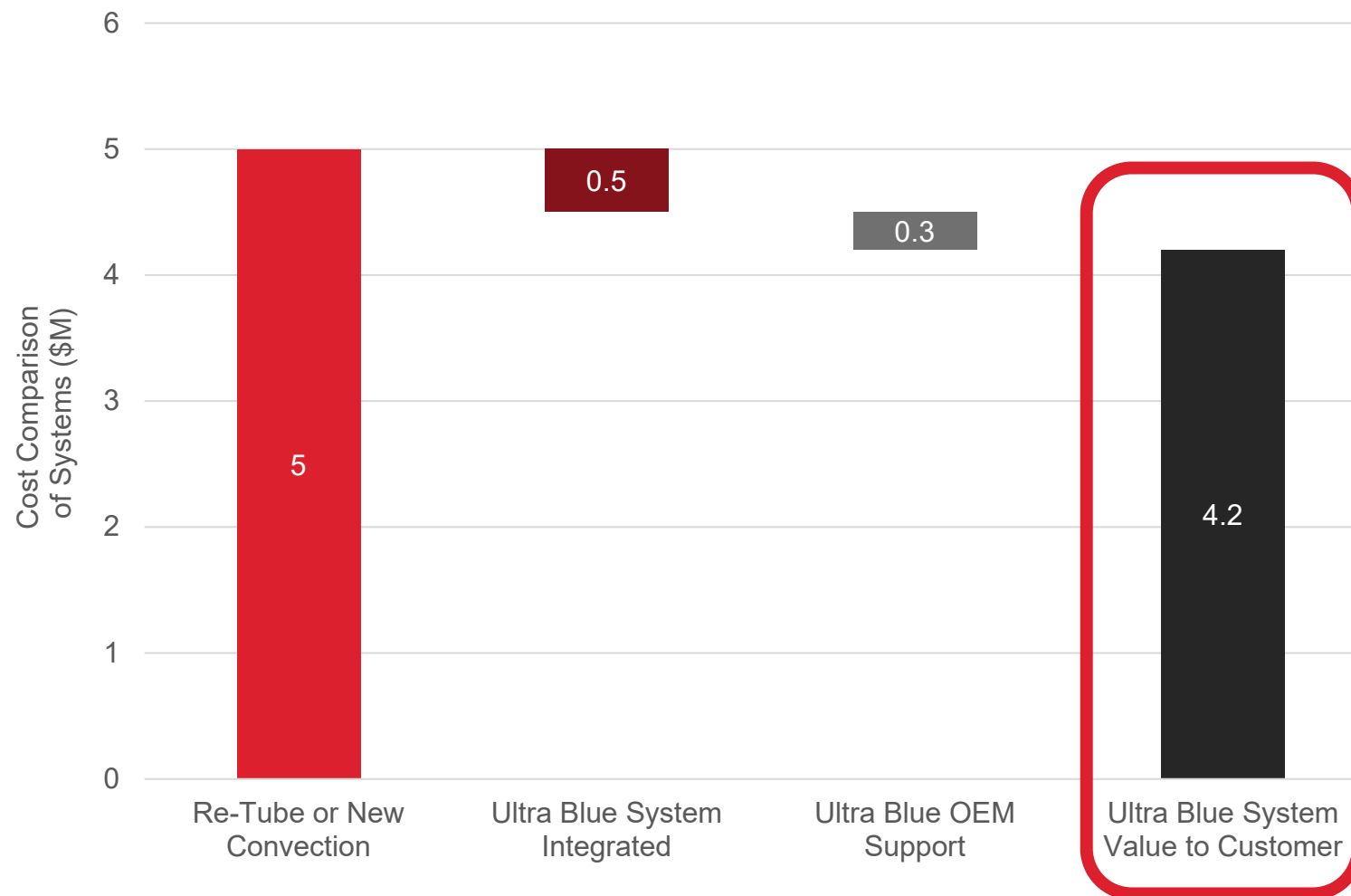


THE ULTRA BLUE SYSTEM DELIVERS CUSTOMER VALUE HEATER REVAMP ELIMINATION

- Reduce NOX Emissions, Achieve New Permit Requirements
- Eliminate Cost (\$5M) for Retube or New Convection Section
- Realize over \$4.2M Savings per Large furnace upfront cost
- Integrate the Ultra Blue System with CUBP Burner
- Supported by OEM
- Cash Model: No OPEX

BONUS:

- Reversibly Transition Petrochemical Complexes and Refineries
- Achieve Zero Scope 1 Emission

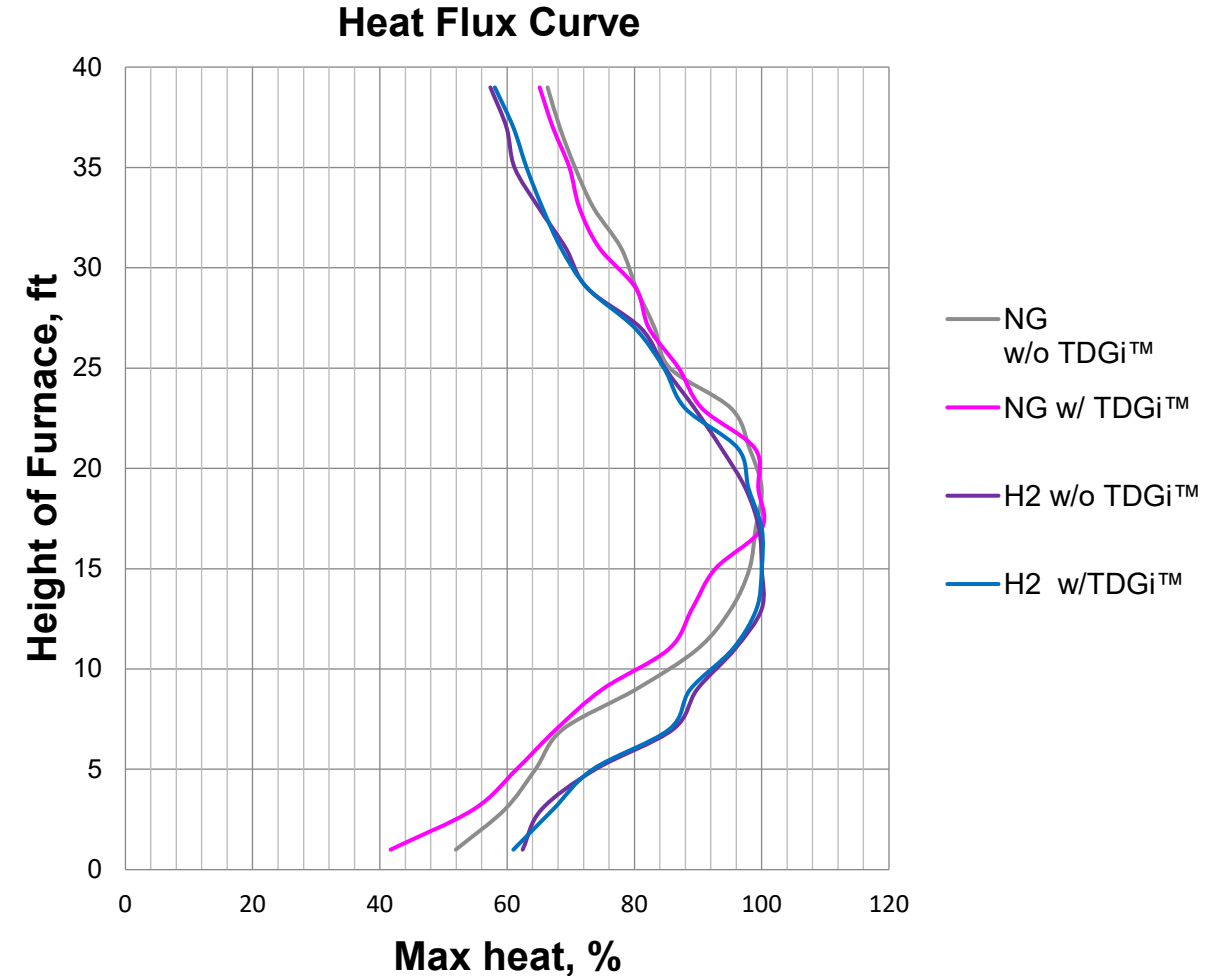


Drive to Zero Scope 1 Emissions with Low NO_x Emissions

THE ULTRA BLUE SYSTEM

CONSISTENT RADIANT SECTION EFFICIENCY

- Extensive Radiant Heat Flux Profile Studies
- Furnace Simulation Validation
 - CFD
 - Physical Testing
 - Process Design and Cracking Models
- Widely Varying Fuel Gases Studies
 - 100% H2 and near 100% H2 Blends
 - Refinery Fuel Gases
 - Natural Gas
 - Process Off Gas and Synthesized Gases
- Predictable Performance with and without TDGi™
 - High Hydrogen Fuel Radiant Efficiency Unchanged
 - Natural Gas Fuel, Slight Shift to Convection Section

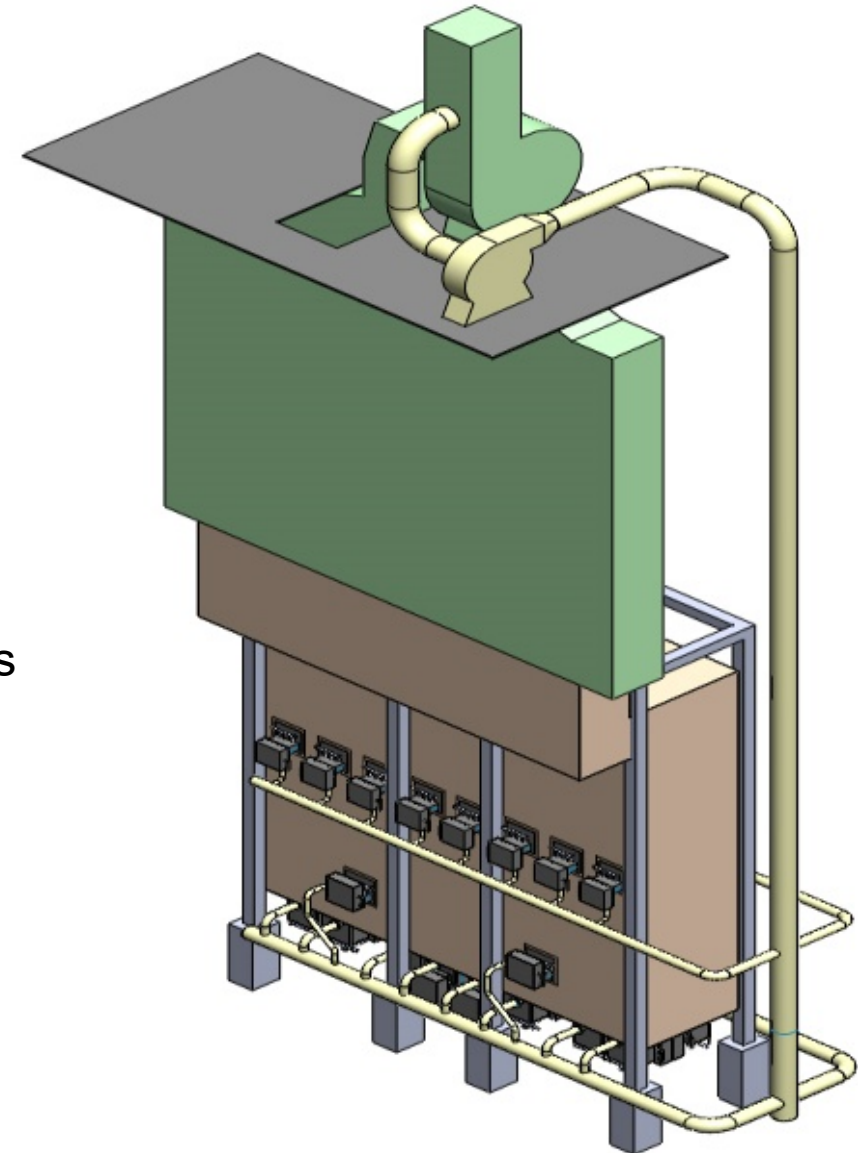


Predictable Radiant Section Performance Delivers Extended Run Times in Energy Transitions

THE ULTRA BLUE SYSTEM

EXAMPLE: FLOOR & RADIANT WALL FURNACE RETROFIT

- Project Goals:
 - 100% Hydrogen Firing
 - 100% Hydrocarbon Firing
 - No SCR: No Plot Space
 - NO_x Reduction to < 30ppm
 - Maintain or Improve Runtime
 - Extreme High Heat Density Furnace
- Replace natural draft floor burners with model CUBPF burners
- Replace premix radiant wall burners with model CUBPF burners
- Flue Gas used for the Targeted De-NO_x Gas injection, TDGi™



THE ULTRA BLUE SYSTEM DRIVES CORPORATE ALIGNMENT OF SUSTAINABILITY GOALS

- Honeywell technology is already transforming the world
- Commitment to make all Honeywell facilities and operations carbon-neutral by 2035
- Our sustainable technology is already out in the world, making an impact
- We will meet at the executive level to ensure alignment of our mutual sustainability strategies
- **Energy Transition Projects are Driven by Aligned Corporate Sustainability Goals and Strategies**



The Ultra Blue System is a Honeywell Key Strategic Sustainability Technology

CONTACT UOP CALLIDUS AND GREENS COMBUSTION

Find Out More:

- Schedule a Feasibility Study or FEED Fired Demonstration Test
- Establish Exact Design and Performance
- Greatly Reduce Project Performance Risk

Callidus Technologies

7130 South Lewis Ave.
Suite 500
Tulsa, Oklahoma 74136
U.S.A.
Tel: +1-918-496-7599

www.callidus.com

Honeywell UOP

25 East Algonquin Road
Des Plaines, IL 60016
U.S.A.

<https://uop.honeywell.com/>

Greens Combustion Ltd.

A31 Arena Business Centre,
Holyrood Close, Poole,
Dorset, BH17 7FJ, UK
Switchboard: +44 (0)1202
607563

info@greenscombustion.com



Know Emission Performance Before Speaking with Regulators and Permitting

FULLY DEVELOPED: THE ULTRA BLUE SYSTEM APPLICATIONS **BRING US YOUR APPLICATIONS AND WE WILL SHOW YOU HOW THEY CAN WORK**



Steam Crackers
100% Hydrogen Firing
Sub-25ppm NO_x¹



Process Heaters
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Sub-5ppm NO_x¹



Radiant Wall SMR
100% Hydrogen Firing
Sub-5ppm NO_x¹



Down-Fired SMR
100% Hydrogen Firing
Sub-10ppm NO_x¹

Thank you. We are Ready Your for Questions.