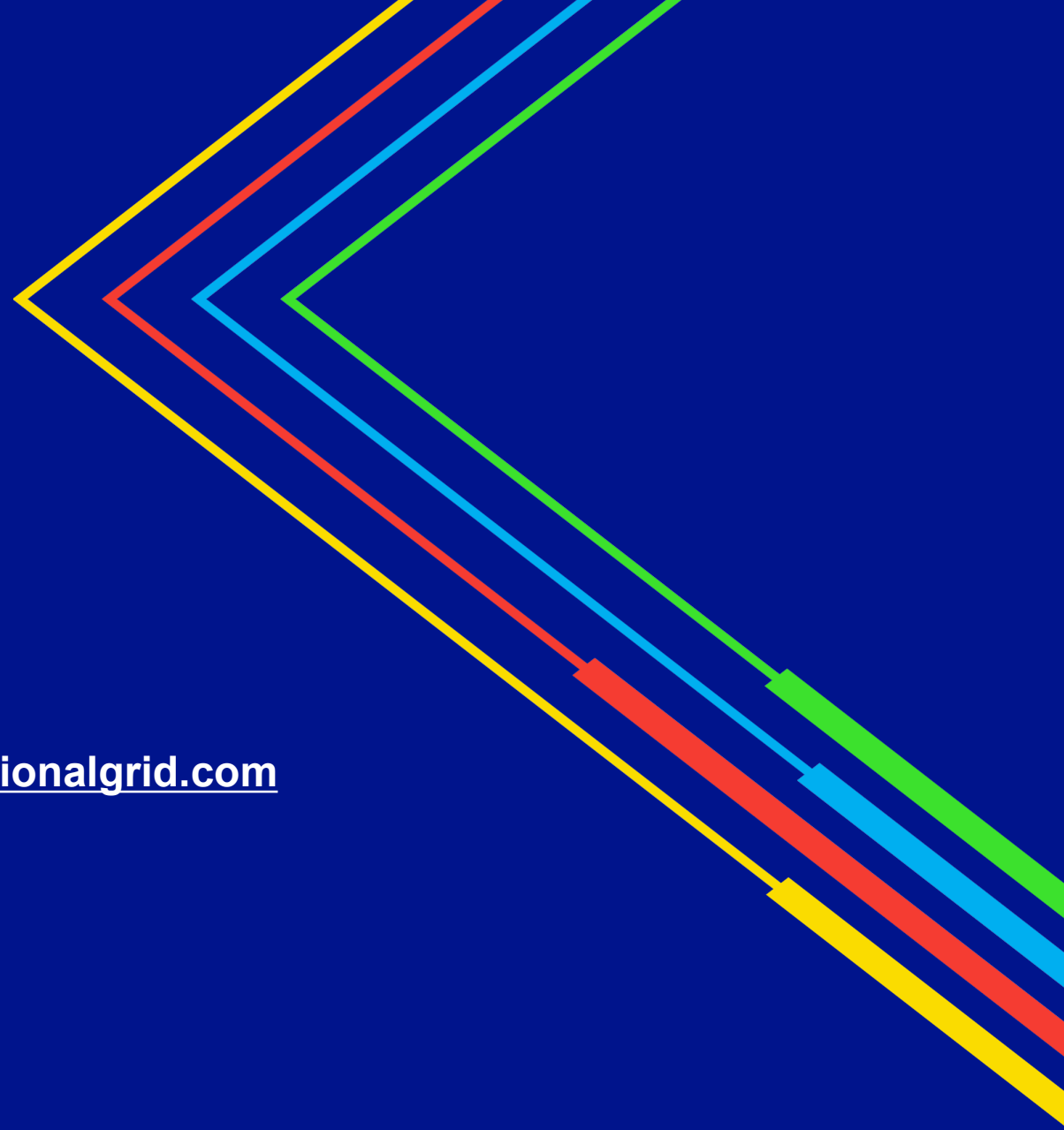


August 2025 PEX Meeting

August 20th, 2025

Mathew McCarthy mathew.mccarthy@nationalgrid.com

national**grid**



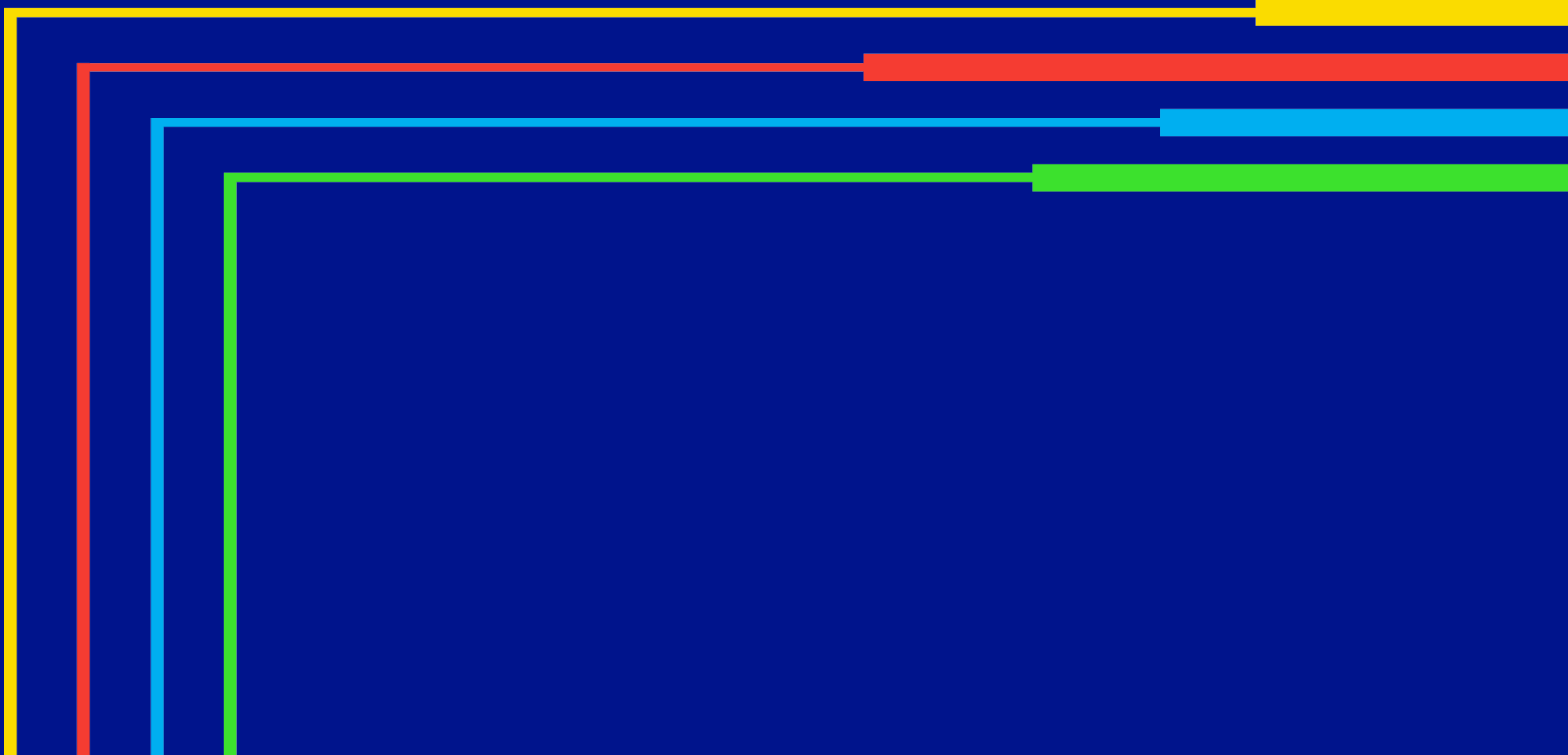
Contents

01	Safety Moment: Submerged Vehicles – Emre Schveighoffer
02	ConDex Condensing Economizers - Combustion and Energy Systems, Ltd.
03	Company Overview and CO2 Heat Pump Technologies - APA/Ambient Enterprises
04	PEX Program Progress – Mat McCarthy
05	Quick Hits, Reminders, and Next Meeting – Mat McCarthy

01

Safety Moment – Submerged Vehicles

Emre Schveighoffer emrejs@nrminc.com





Car Safety in Floods: How to Escape

Lessons from a veteran trained in underwater escapes that could save your life when seconds count. This presentation will teach you essential techniques to escape a sinking vehicle - knowledge that most drowning victims never had the chance to learn.



Why This Matters

Most drowning victims never knew knew what to do

When a car enters water, confusion and panic set in immediately. Without proper knowledge, victims make fatal mistakes in the in the critical first moments.

Seconds matter when underwater

A car can fill with water in less than 60 seconds. Your window for escape is extremely extremely short, and every action must be be deliberate and effective.

Preparation prevents panic

Over 70% of vehicle drowning victims show show signs of panic response. Knowing exactly exactly what to do can override this natural but natural but deadly reaction.

What NOT To Do



Don't Try to Open Doors



Don't Roll Down Windows

Step 1: Use Your Headrest



Remove Headrest

Push the release button at the base of the headrest poles and pull upward upward firmly to detach it completely from the seat.



Position Metal Prongs

Grip the headrest firmly with both hands, positioning the metal prongs toward the window. These prongs are rigid enough to serve as an emergency tool.



Strike Corner of Window

Aim for the corner of the window, not the center. The corner is the weakest point. Use the metal prongs to strike with force until the glass breaks.

Most people don't realize their headrest is designed to be removable and can serve as a lifesaving tool in emergencies.



Step 2: Escape Through the Rear Window



WHAT WOULD YOU DO IF
THERE WAS NO SIGN?

Why the Rear Window?

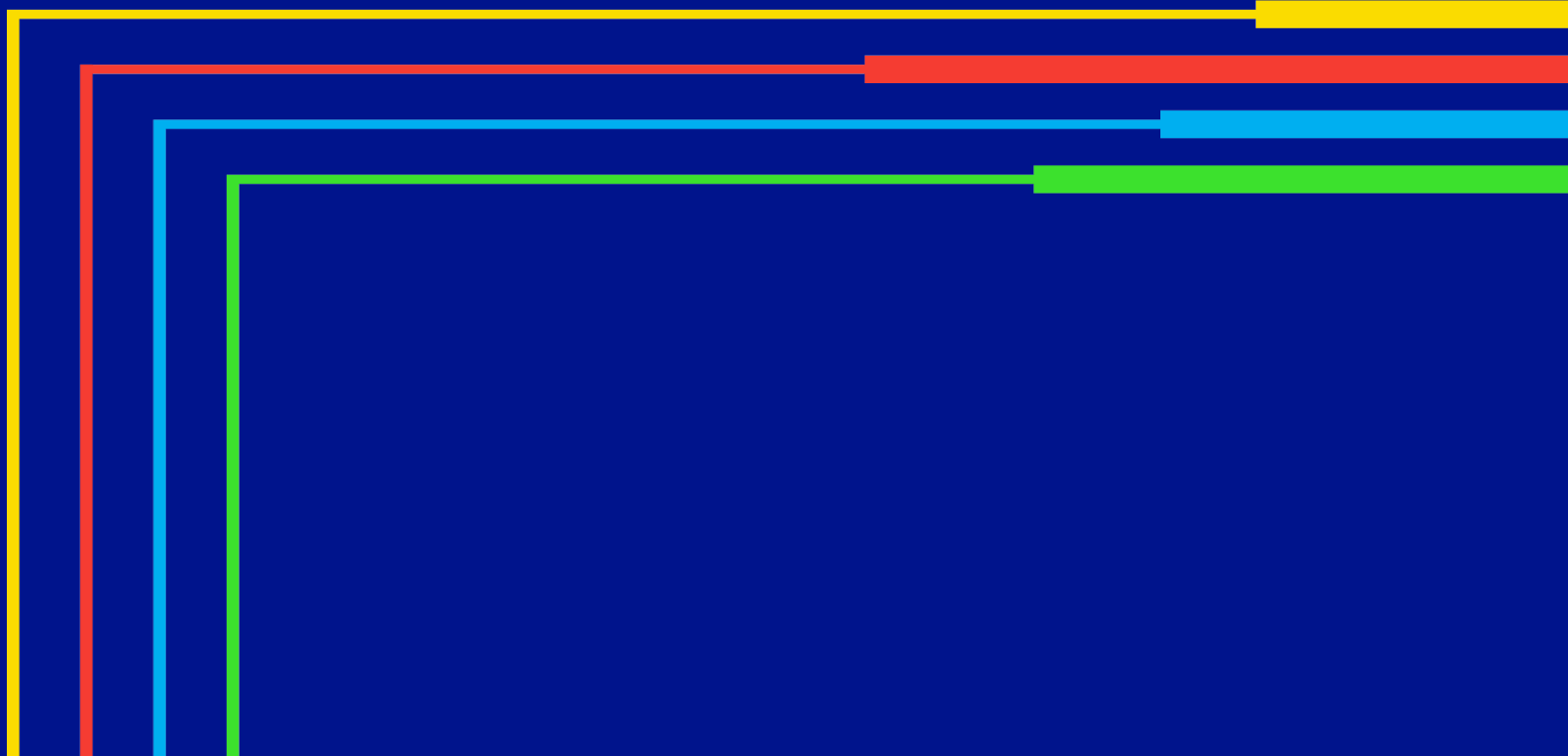
- Cars naturally sink **front-first** due to engine weight
- Rear window stays above water longer, giving you more time
- Less water pressure against rear glass compared to side windows

⚠ **Remember:** Stay calm, breathe deeply before submersion, and move and move with purpose. Panic is your enemy.

Once through the window, push away from the vehicle and swim to safety. If you have passengers, children should exit first with adults assisting from behind.

02 ConDex Condensing Economizers - Combustion and Energy Systems, Ltd.

Joe Richter jrichter@combustionandenergy.com



national**grid**

Maximizing Energy Efficiency Through Condensing Economizers

New England Installations

nationalgrid

August 20, 2025

Goals

- Reduce Gas Consumption
- Reduce Carbon Emissions
- Improve Efficiency
- Save Money year after year

Industries that benefit from ConDex

Agriculture

Automotive

Brewery

Biotech

Chemical

Dairy

Distillery

District Heating

Ethanol

Food/Beverage

General Industrial

Healthcare

Laundry

Military

Mining

School/University

Spa/Swimming Pool

What to look for in your plant

Heat Sources

- Boilers
- Thermal Fluid Heaters
- Gas Turbines
- Ovens
- Dryers
- Engines
- Incinerators
- Fume Hoods

Heat Sinks

- Make Up Water
- Building Make Up Air
- Process Water/Fluids
- Clean Up Water (CIP)
- Domestic Hot Water
- Swimming Pool
- Combustion Air Preheat
- HVAC Heating
- HVAC Cooling
- Electricity Generation



Installation 10/2023



Hans Kissle Foods
Haverhill, MA

Salads and Prepared Foods

Using exhaust from their 300HP firetube boiler,
Hans Kissle will heat up to 30 GPM of water from
50F to 140F for clean up or process

Energy Savings: 875,281 BTU/Hr
47,961 Therms/year

Payback period with National Grid Incentive:
1.53 Years



Installation 1/2024



Piantedosi Bakery
Malden, MA

Wholesale Bread Bakery

Using exhaust from their (2) 100HP firetube boilers,
Piantedosi will heat up to 6 GPM of water for clean
up or process from 65F to 175F

Energy Savings: 337,362 BTU/Hr
29,013 Therms/year

Payback period with National Grid Incentive:
15 Months



Home Market Foods
Norwood, MA

Premium Food Products

Using exhaust from their regenerative thermal oxidizer, Home Market will heat up to 30 GPM of water for clean up or process from 55F to 210F

Energy Savings: 2.35 MMBTU/Hr
117,500 Therms per year

Installation 12/2022



Lightlife Foods
Turners Falls, MA

Plant Based Foods

Lightlife installed 2 ConDex Microbox
condensing economizers on 2 150 HP firetube
boilers to heat 10 GPM of water from 60F to 159F
for clean up and process.

Energy Savings: 499,151 BTU/Hr
43,426 Therms per year

Installation 9/2023



Gortons Fish
Gloucester, MA

Breaded Fish Products

Taking heated exhaust from two Fulton Thermal Fluid Heaters, Gortons used a glycol loop to move heat to their HVAC system, reducing natural gas use in the winter and providing chilled water for air conditioning in the summer.

Energy Savings: 1.48 MMBTU/Hr
118,400 Therms per year

Installation 1/2009



§ WASHINGTON BATHS §

Washington Baths
Portland, ME

Public Sauna & Bath House

process, Washington Baths recovers energy to heat shower water, domestic hot water and under patio heating in the winter.

Energy Savings: 422,673 BTU/Hr
5,917 Therms per year

Installation 9/2020



Installation 1/2012



Westrock Paper
Sheldon Springs, VT

Paper & Packaging Manufacturer

WestRock paper (Formerly Rock Tenn) in Northern Vermont, installed a Condex system to capture exhausted energy from three large boilers. The energy is used to heat 120 GPM of boiler feedwater, 30 GPM of boiler make up water and 50 GPM of process shower water.

Energy Savings 8.73 MMBTU/Hr
725,042 Therms/Year



Table Talk Pies
"America's Favorite Pie"

Table Talk Pies
Worcester, MA

Fresh Baked Pies

Using their two, 100HP boiler exhaust, Table Talk Pies are heating 30 GPM of water from 55F to 63F for use in the baking process.

Energy Savings 120,422BTU/Hr
10,476 Therms/Year

Installation 12/2022

Additional benefits of adding a ConDex System

- Cooler exhaust gas
- Reduced moisture in exhaust gas
- Source of free water from condensate
- Increased production without increased boiler capacity
- Reduced boiler load with less wear and tear
- Hot condensate or MU water entering DA – less water hammer
- Instantaneous energy saving readout
- Reduced fuel treatment & water treatment
- Minimal maintenance

Ready and willing to visit sites with you or in follow up to your initial contact

1st thing is to determine if there is a viable project

2nd Gather heat source and heat sink data physical space available, Fuel costs, operating timeframe

3rd Generate a proposal including heat recovery capability, fuel savings per year, emission reductions per year.

Contact:

Joe Richter

Combustion & Energy Systems, Ltd

jrichter@combustionandenergy.com

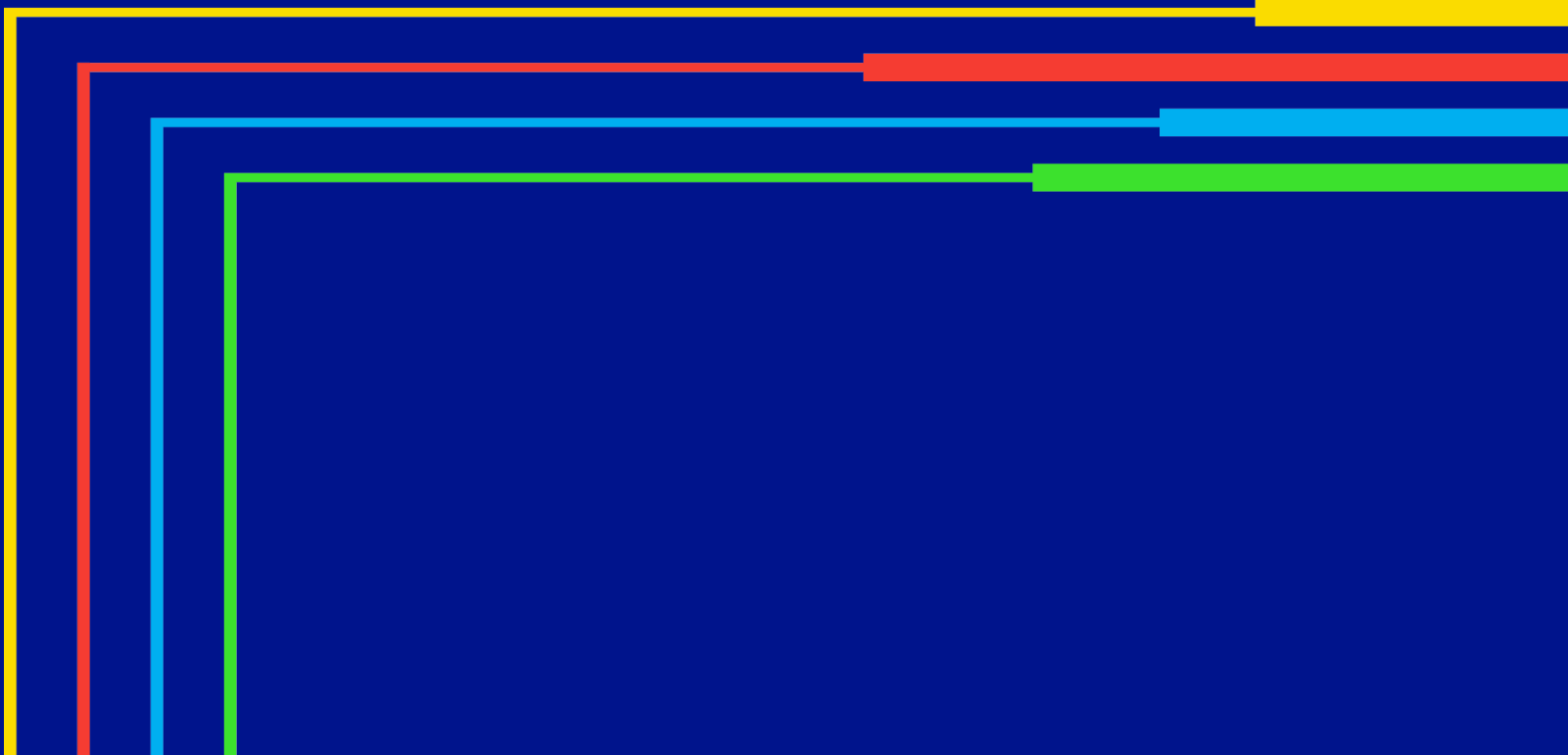
Cell 603 498-1809

Office 603 910-5174

03

Company Overview and CO2 Heat Pump Technologies - APA/Ambient Enterprises

Nick Branzetti nbranzetti@apav.com



nationalgrid



Flow

Environmental Systems Inc

APA Presentation of
Flow Environmental

ANSWR CO₂ Heat Pump

- High Efficiency
- Decarbonizing
- Electrification

National Grid PEX Group

nationalgrid

Who is APA?

- ❑ **APA** is Manufacturer Rep firm in both Commercial & Residential HVAC space who works closely with Owners, CRE's, GC's, Prop Mgmt Groups, Mechanical & Electrical Contractors, and Engineer Design Firms, all around New England
- ❑ **APA** maintains an **extensive line card of MFG's & products** to serve both the common and unique needs of the territory, with a focus on **higher efficiency options and energy savings**.
- ❑ **APA** is a wholly owned subsidiary of **Ambient Enterprises**, one of the largest HVAC conglomerates in the country. This allows us access to Ambient's wide portfolio of MFG's, other rep firms and territories, and many service orgs around the nation
- ❑ **APA** Engineers are subject matter experts with a deep understanding of specific HVAC needs & viable products. We **collaborate with all parties owning responsibilities** within your project to ensure success



HVAC TECHNOLOGIES
PROUDLY REPRESENTS THE FOLLOWING MANUFACTURERS

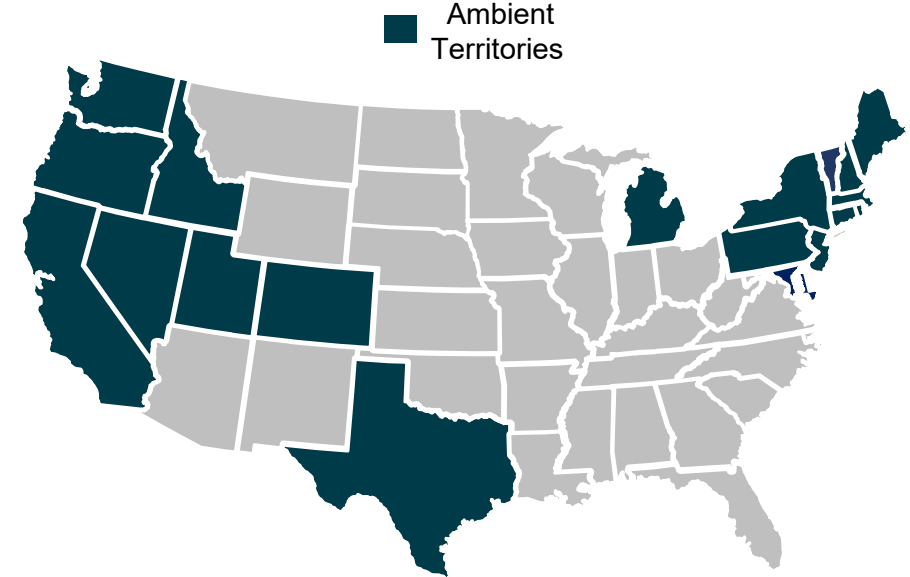
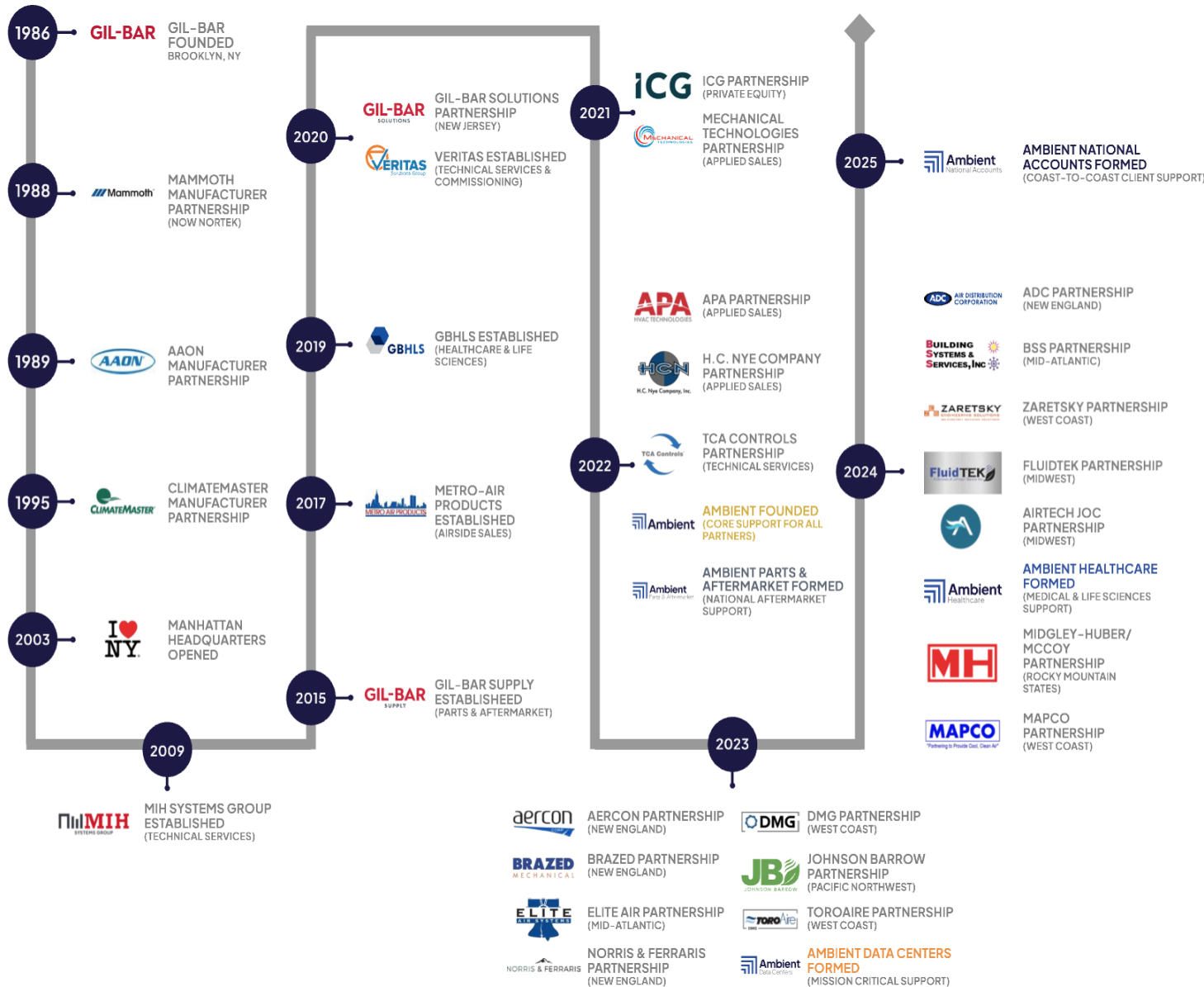
 Air handling units (AHU), air-cooled and evaporative-cooled rooftops (RTU), cold climate air-source and water-source heat pumps, split systems	 Variable frequency drives, active front end drives, harmonic solutions, and motors	 Mission critical cooling equipment, vertical, wall and ceiling mounted, floor consoles, dry coolers, pump packages	 Humidity and temperature control for commercial and industrial agricultural applications
 Custom all aluminum site or factory built AHUs	 Engineered airflow measurement and control, custom solutions for all applications	 Prefabricated mechanical penthouses, DX, cleanrooms, hospitals, custom AHUs	 Engineered air mixing of outdoor and return air for AHUs
 Custom AHU solutions, including build-on-site replacement units	 Humidification and evaporative cooling solutions	 Active chilled beams, induction diffusers, induction unit retrofits	 Total environmental desiccant dehumidification solutions
 Electronic air cleaners, high efficiency, reduce maintenance, saving energy, reduce disposal costs	 VAV terminal units, fan coils, AHUs	 CO2 electric heat pumps with wide ambient operating range, produces up to 180°F and down to 38°F water	 Commercial packaged RTUs and condensing units
 Axial fans for HVAC, smoke, tunnel, garage ventilation	 Variable refrigerant flow (VRF) systems, energy recovery ventilators, dedicated outdoor air, indoor units, controls, air-to-water heat pumps	 SmartStack™—Active airflow measurement and control of laboratory exhaust systems	 ArctiDry—liquid desiccant air conditioning RTU for high ventilation and low dewpoint applications
 Air and water-cooled medical, process, Turbocor chillers	 The largest family of custom AHUs in North America • Governair • Huntair • Mammoth • Temtrol • Venmar • Ventrol	 Precision airflow control for fume hoods, laboratory, critical healthcare environments	 Dehumidification, heating, cooling, ventilation systems for indoor pools
 Airflow and pressure measurement and control for ducts, fans, outdoor air intakes	 Advanced exhaust systems for laboratory fume hoods, energy recovery systems	 Fans for commercial and industrial applications, standard and semi-custom available	 Dedicated outdoor air units, makeup air units, exhaust fans
 Energy recovery wheels	 Ultraviolet (UV) products for all HVAC applications	 Engineered noise mitigation products for ducts, panels, enclosures, mechanical vibration solutions	 Environmental Wall System—complete packaged, decentralized heating, cooling, and ventilation

Newburyport Office
39 State Street
Newburyport, MA 01950

Canton Office
4 Campanelli Circle, Canton, MA 02021
P.O. Box 682, Randolph, MA 02368

Maine Office
11 Main Street, Suite 2 Front
P.O. Box 526, Kennebunk, ME 04043

Ambient's Geography & Capabilities Continue to Grow...



CURRENT:

48 Companies

20 States

28 Warehouses

Who is Ambient Enterprises?

Leading Provider of Engineered HVAC Solutions

- **Ambient:** Is one of the largest manufacturers' reps in the country, for a variety of commercial HVAC MFG's big & small
- **Go-To-Market:** We work closely with Design Engineers, GC's, Mechanicals & Electrical Contractors, Owners, Commercial Real Estate Groups, Energy-as-a-Service firms, etc to supply best-of-breed HVAC equipment & services for new construction, replacement, renovation, and upgrade projects
- **Verticals:** Ambient serves wide array of end verticals including: *Commercial, Institutional, Education, Healthcare, Data Center, Residential, Life Sciences, & Hospitality*
- **Field Services:** Our growing and sophisticated services division has expertise & capabilities to contract for break/fix, startup, install, retrofit, and long-term maintenance
- **Expertise:** Strong infrastructure of employees & partners nationally with focus on equipment, efficiency, sustainability, and trends to ensure success with clients & projects



Flow

Environmental Systems Inc.

ANSWR

CO₂ Heat Pump

APA
HVAC TECHNOLOGIES

- ✓ CHILLER
- ✓ BOILER
- ✓ HOT WATER
- ✓ HEAT RECOVERY
- ✓ FREEZER/COOLER
- ✓ REHEAT
- ✓ WATER SOURCE
- ✓ AIR SOURCE

... AND MORE



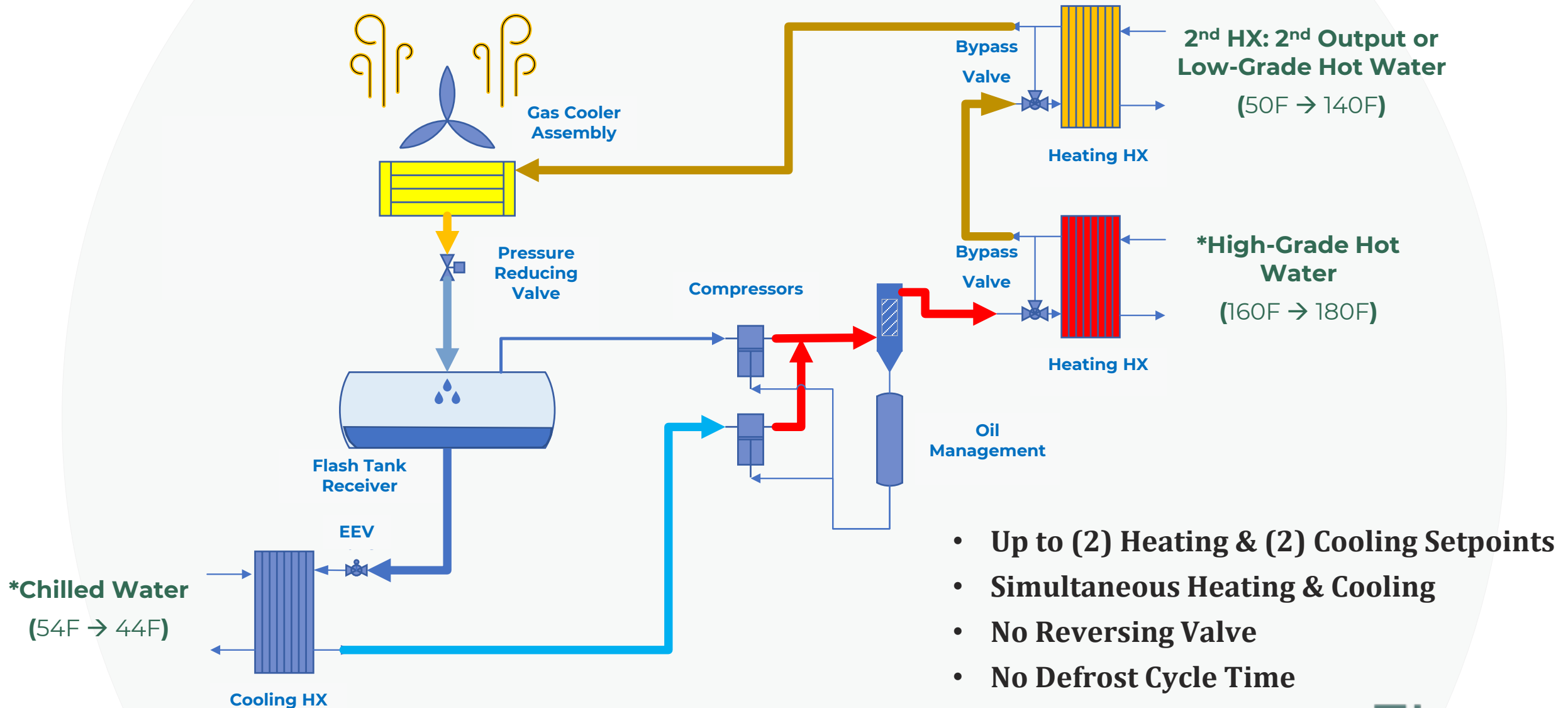
ANSWR: *Why* CO₂ ?

Globally, CO₂ is the fastest growing refrigerant!

- CO₂ was the first refrigerant & widely used
- Wide temperature range
- Never going to be “regulated out”
- Good availability of workforce for CO₂ HVAC
- Demonstrated long life and high reliability
- Utilized across many industrial applications



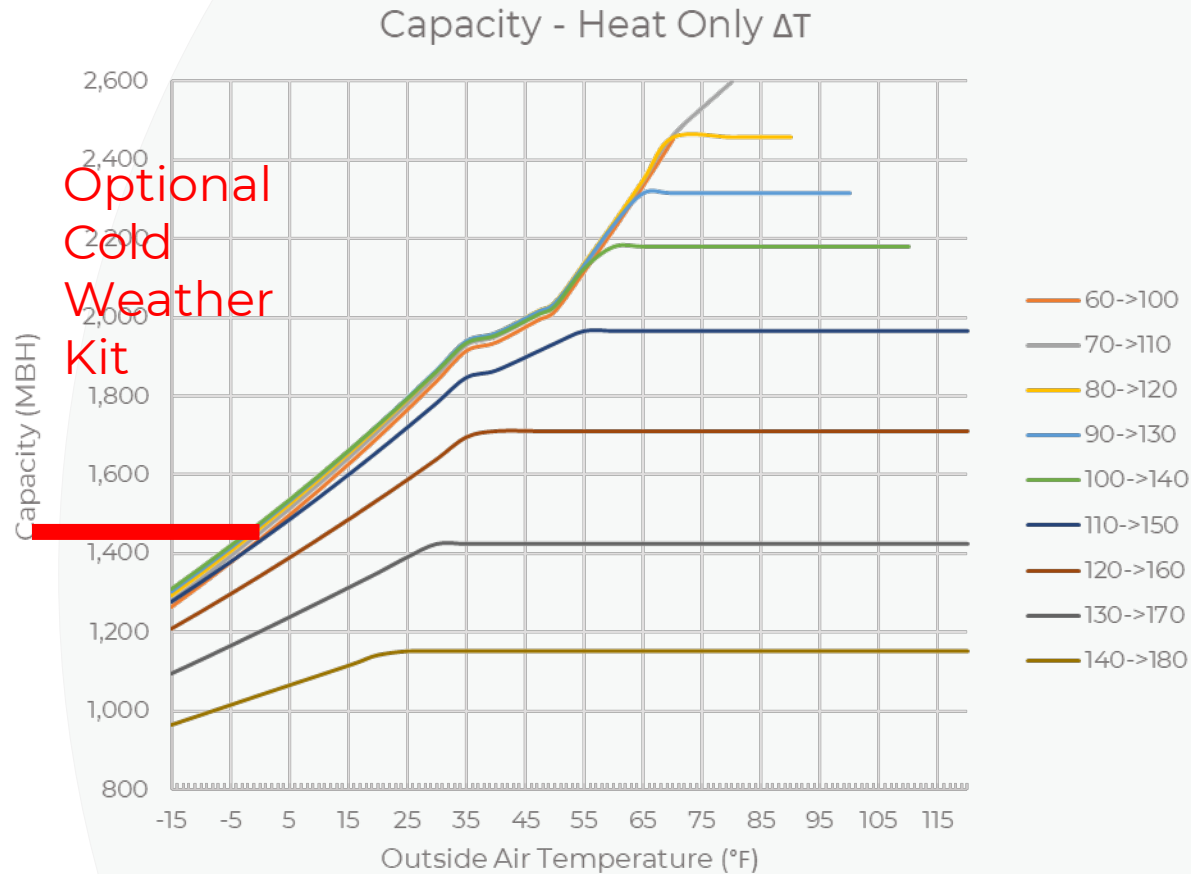
Flow's CO2 Refrigerant Loop



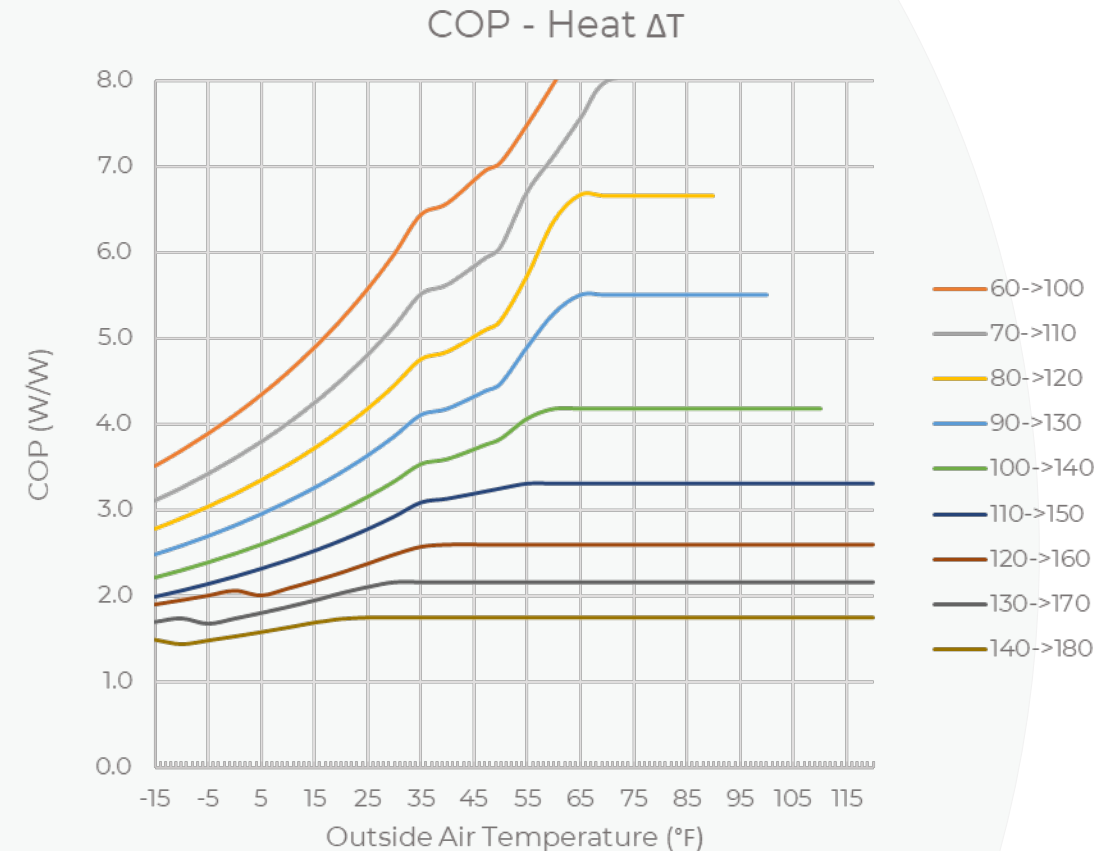
*Patent Pending

Flow

Flow Heating Ranges



Capacity is determined by total delta of both heat loads, single loads are shown above



Lower EWT is key to higher COPS
Also having two heating loads and higher deltas

ANSWR: Designed for benefit now and in the future...

High Efficiencies

- Highest COP over full range of temperatures
- Replaces gas & fossil fuel heating (100-180F water)
- Reduce total equipment need & spend

Economical Solution

- Cost effective manufacturing
- Single point power, simple water connections
- Serves as multipurpose unit for lower cap-ex costs
- Minimizes need for redundant defrost equipment, resizing air coils, building piping, etc.

Wide Capabilities

- CO₂ heat pump for commercial HVAC & boiler application
- Accepts unbalanced loads and low delta-T
- Simultaneous heat & cool over extreme range of temps
- Patented defrost prevention technology

Easily Accessible Componentry

- All components sourced from minimum (2) suppliers
- Many available via any local refrigeration suppliers

Right Choice For Future

- Not affected by pending regulations
- Supports decarbonization & electrification efforts
- CO₂ = readily available, non-toxic, non-flammable



Flow

ANSWR CO₂ Heat Pump – *Best Applications:*

Building Minimums:

- Minimum 20 Ton cooling load
- Minimum 200 MBH heating loads
- Minimum 10,000 sq ft
- Existing Chiller Water and/or HW Infrastructure

Buildings Types:

- Office Buildings
- Multi-Family
- Life Science
- Hospitals + Medical
- Industrial
- Higher Education
- K-12 Schools
- Dormitories
- Correctional Facilities
- Municipal Buildings

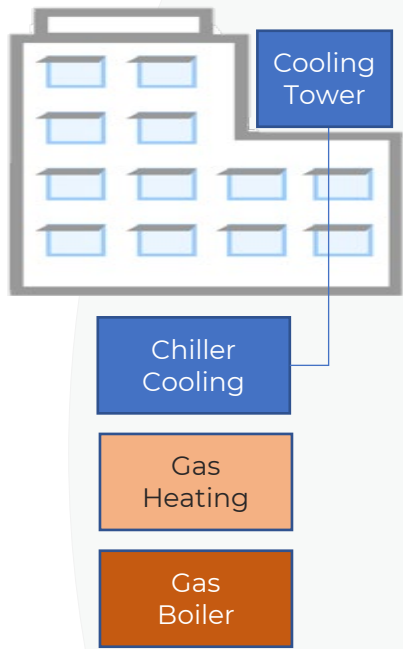
Well Suited Applications:

- Avoiding the use of Electric Boilers
- Fossil fuel heating HW + Domestic HW system
- Transitioning to Air Source Heat Pumps
- Electrification/Decarbonization
- Simultaneous heating & cooling
- 150°F + supply hot water heating
- Cold climate performance down to -40°F ambient
- Heat recovery systems
- Environmentally friendly
- Readily available parts & refrigerant (CO₂)

Example Application (Streamlined & Efficient):

Base Line

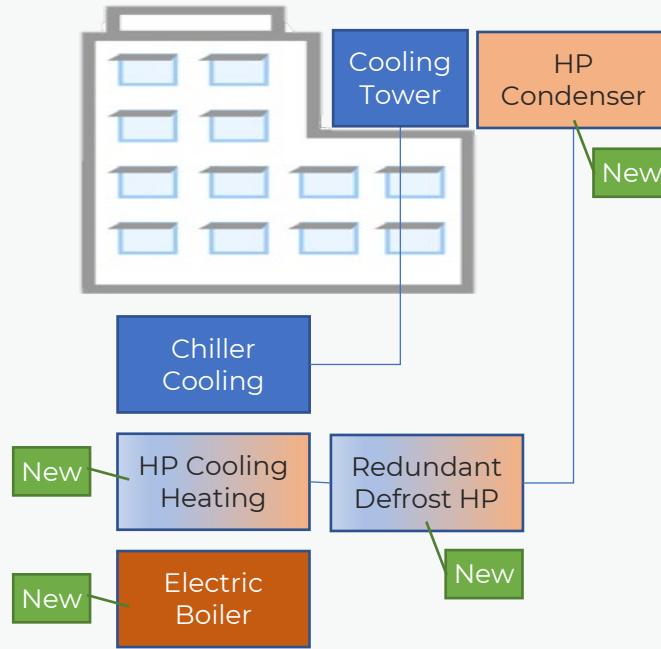
Existing Building



- Many separate systems
- Cooling: 100% electric central system with high GWP refrigerant
- Heating: 100% fossil fuel central system

Other Heat Pumps

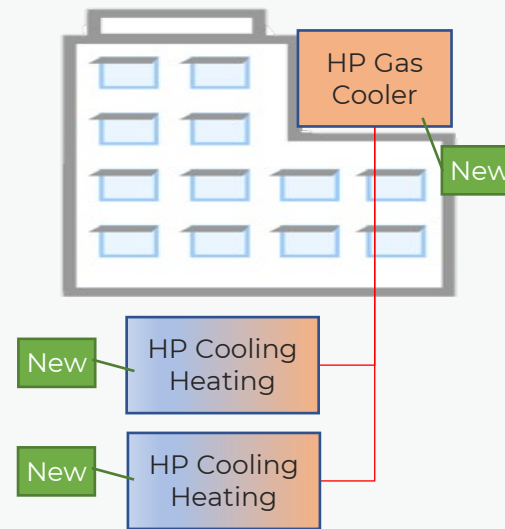
Competitor HFC Tech 3.5 year ROI



- More equipment
- Cooling: 100% electric central system with high GWP refrigerant
- Heating Supply Temps <135°F: HFC/HFO equipment with high GWP's
- Heating Supply Temps >135°F: Electric Resistance Heating

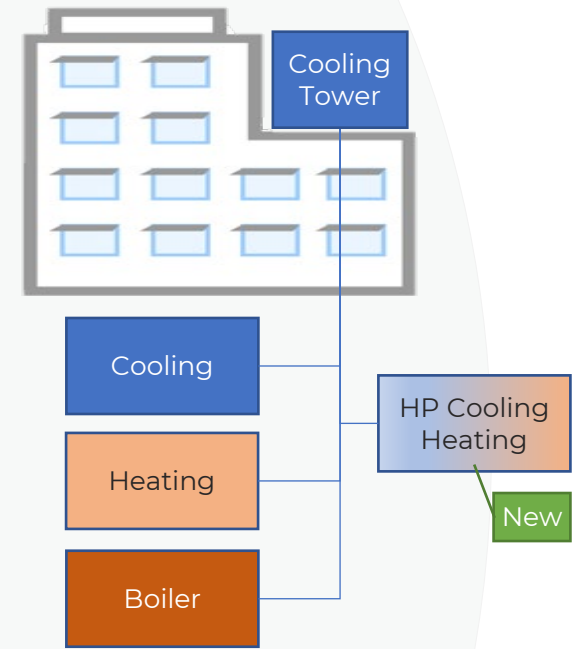
Applications with Flow Heat Pumps

New Construction 2.5 year ROI



- **Eliminate Redundant Defrost HP**
- **Eliminate need for Electric Boiler**
- **Efficient:** 1 power feed, up to 4 thermal outputs
- **Save Space, less equipment**
- Systems can be installed in parallel for **large installations**

Retrofit or Expansion < 1 year ROI



- **No new power feed** to electrify heating if you replace the chiller
- **Do not need to change building systems** (pipes, coils, AHU's, etc.)
- **Stage Installation.** Replace legacy equipment over time.
- **Same operational range**

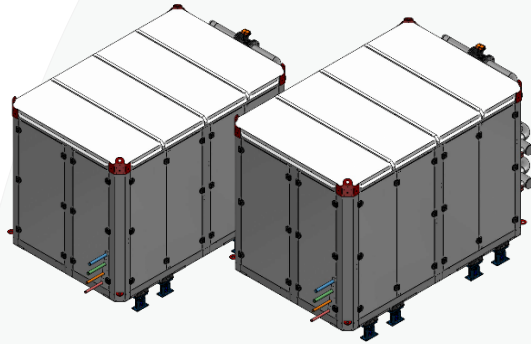
ANSWR Systems Are Highly Configurable

Heat Pump(s)

-Split System-

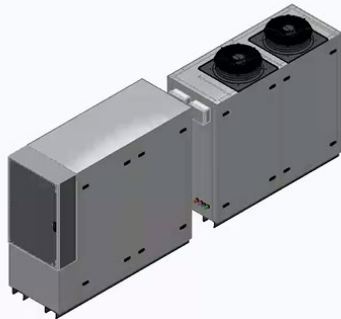
Gas Cooler(s)

Packaged Unit

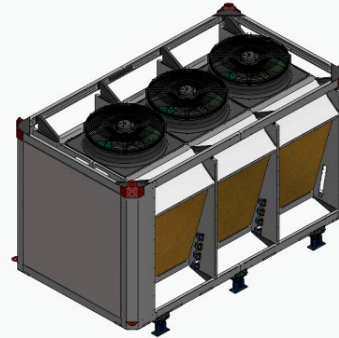


20TR Model

(fits through door & elevator)



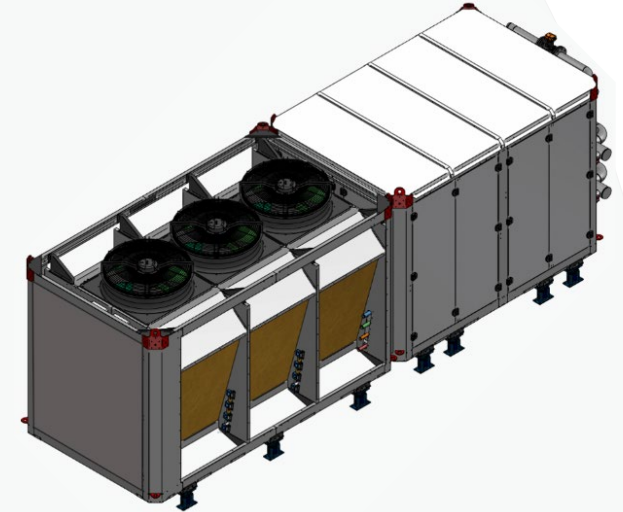
V-Bank



Horizontal



Vertical



- HVAC Heating & Cooling
- Simultaneous Heating & Cooling
- Domestic Hot Water Production
- Hot Water Boilers

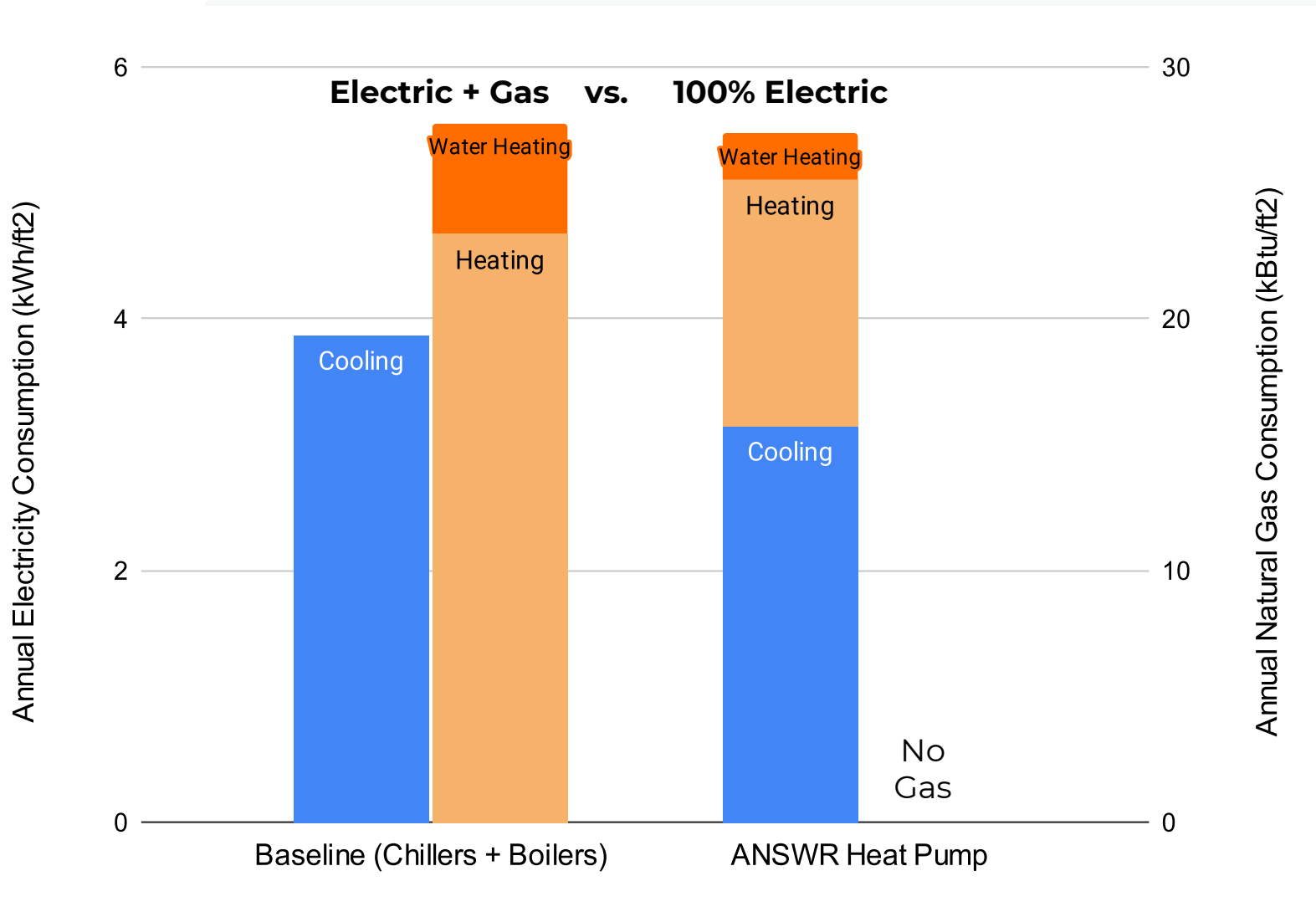
*Modules are designed for parallel installation

*Air-to-Water + Water-to-Water

*400-Ton unit available for order w/ delivery Q3-26'

Flow

Natural Gas → Electrification (clean sources)



Baselines:

Chiller/Boiler (Electric + Gas)

- Gas: 8.2 kWh/ft²
- Electric: 3.9 kWh/ft²
- Total: 12.1 kWh/ft² Equivalent

100% Electric

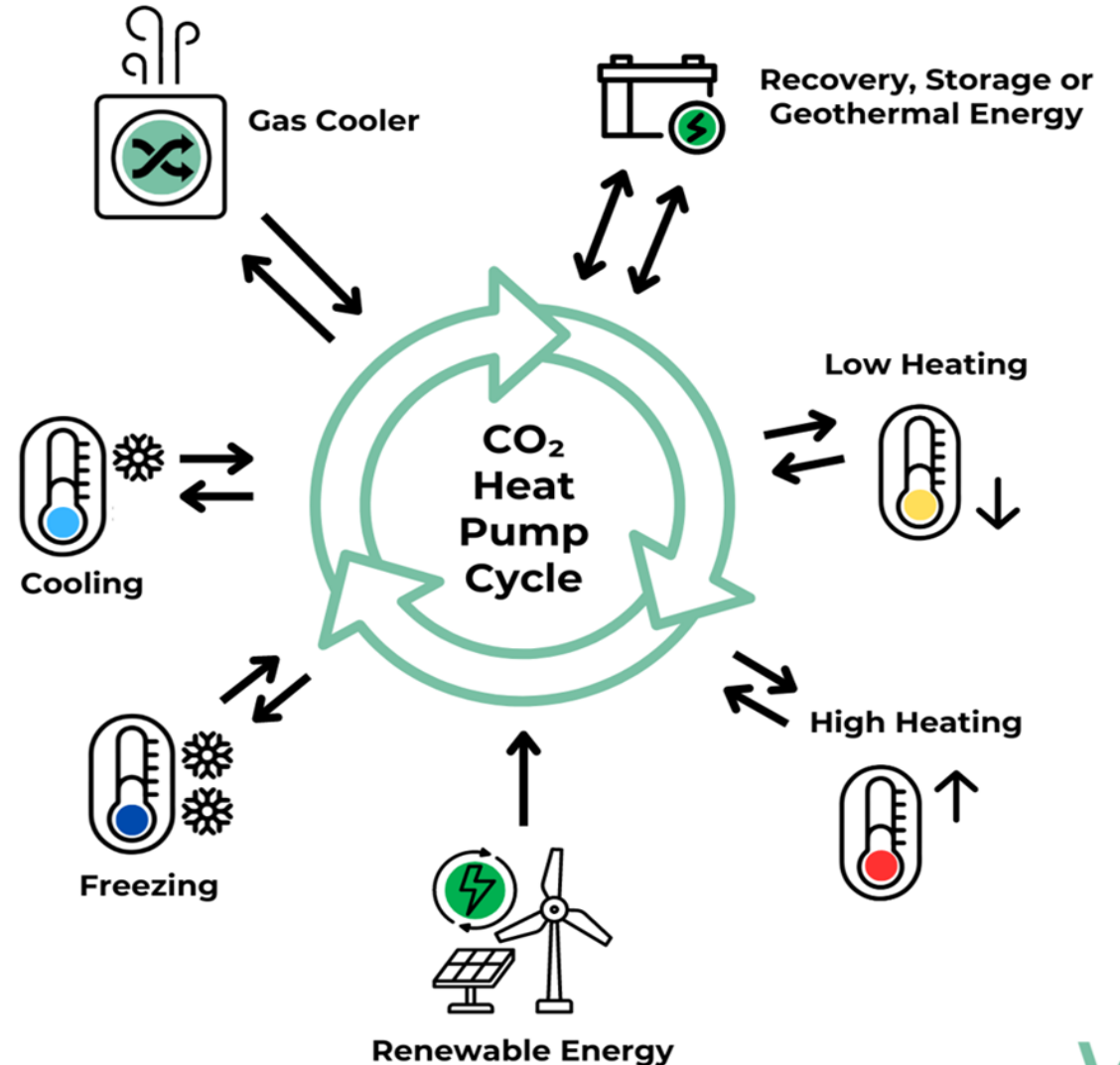
- Electric: 5.5 kWh/ft²
- 54.5% Reduction
- 6.6 kWh/ft² reduction
- Average 3.5 COP annually

How ANSWR's Energy Recycling Works?

More Load = Higher Efficiency

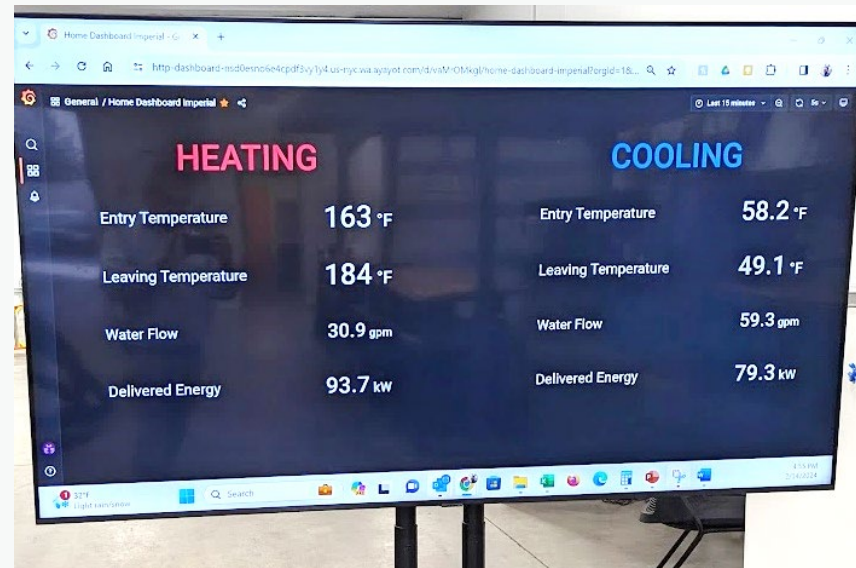
- ✓ Produces Heating
- ✓ Absorbs Heating
- ✓ Reuses Building Energy
- ✓ Minimizes Electricity
- ✓ Increases Efficiency

Do It ALL = **ANSWR**...



Innovation Center & Factory (Rogers, MN)

- Full Factory Tour
- 3rd Party Certified Testing
- Quality & Compliance Testing
- Extensive Customer Demonstrations
- US Based Manufacturing, R&D, & Training



Flow

Flow

Environmental Systems Inc



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Nick Branzetti
nbranzetti@apav.com

Andy Paice
apaice@apav.com

When To Reach Out...??

1. Boiler Replacement
2. Electrification & Decarb Goals
3. High Efficiency Retrofit Projects
4. Multi-Family Heating + Cooling
5. Need for High Temp & Domestic HW

www.flowenvirosys.com

ANSWR

CO₂ Heat Pump

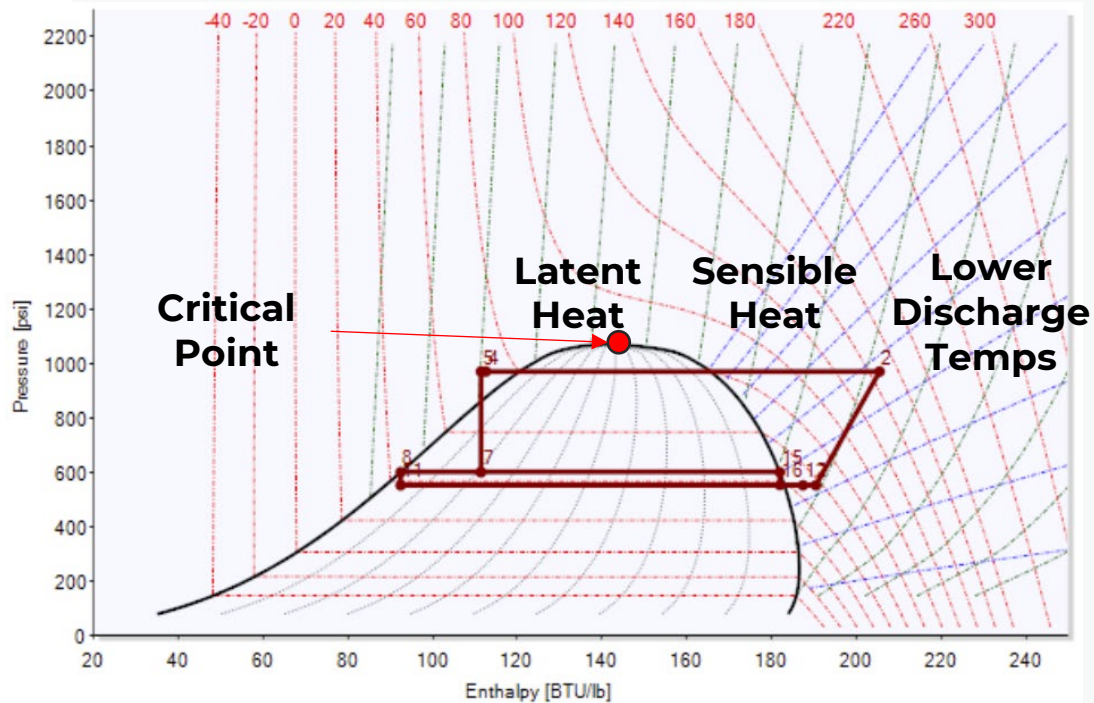
Additional Slides



What is different with a CO₂ Heat Pump?

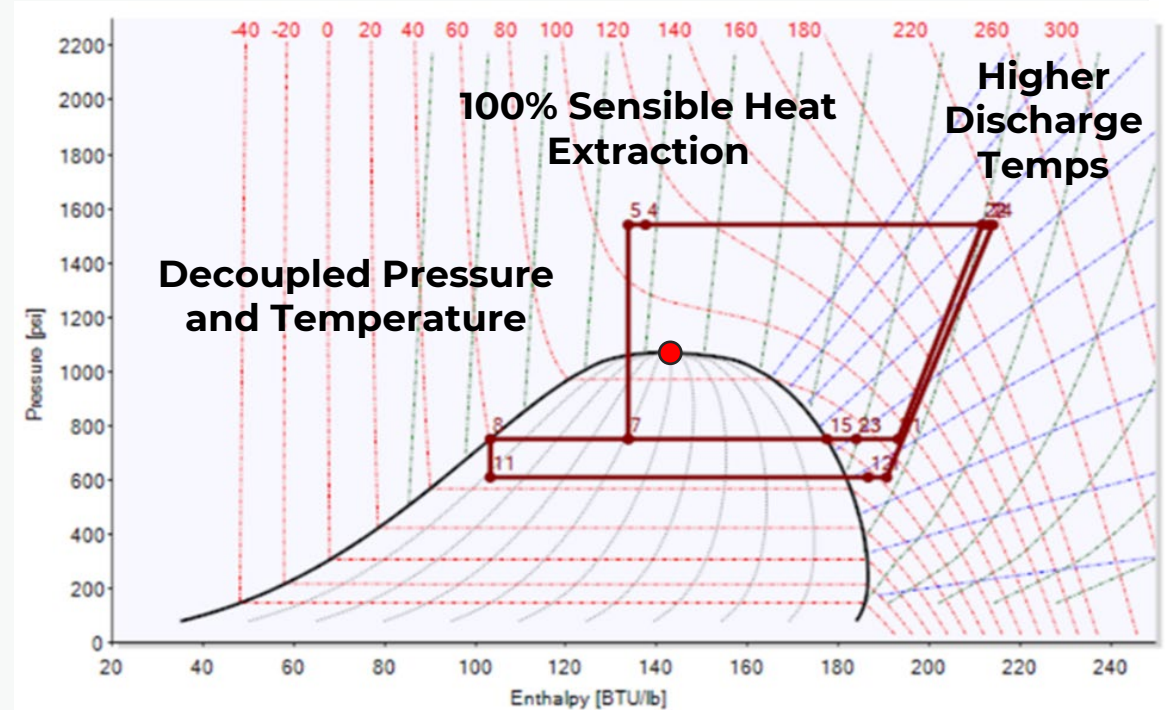
Subcritical

- Refrigerant condenses in the condenser
- **Low Pressure** = Brazed, low cost parts
- **Condensing** = low heat & efficiency, short distances
- 10–20-year life



Transcritical

- Refrigerant does not condense
- **High Pressure** = Welded, SS industrial parts
- **Transcritical** = high heat & efficiency, long distances
- 30–40-year life



How Can *ANSWR* Be Used?

Cooling Only

Heating Only

Simultaneous Heating & Cooling *

- True simultaneous heating and cooling
- No reversing valves

Heat Pump

- AHRI Standard 550/590
- Cooling Supply: 38°F to 75°F (down to 0°F with antifreeze)
- Heating Supply: 90°F to 180°F
- Variable refrigerant flow for stability *

Operational Range

- -40°F to 120°F ambient outside air temps*
- Colder or hotter options possible *
- No defrost derate *

Boiler

- Typical of a recirculating HW Boiler system
- Up to 180°F Supply Hot Water *
- Tight ΔT , as low as 20°F *

Domestic Hot Water

- Water heater
- Up to 180°F Supply Hot Water *
- Large ΔT , as high as 140°F *

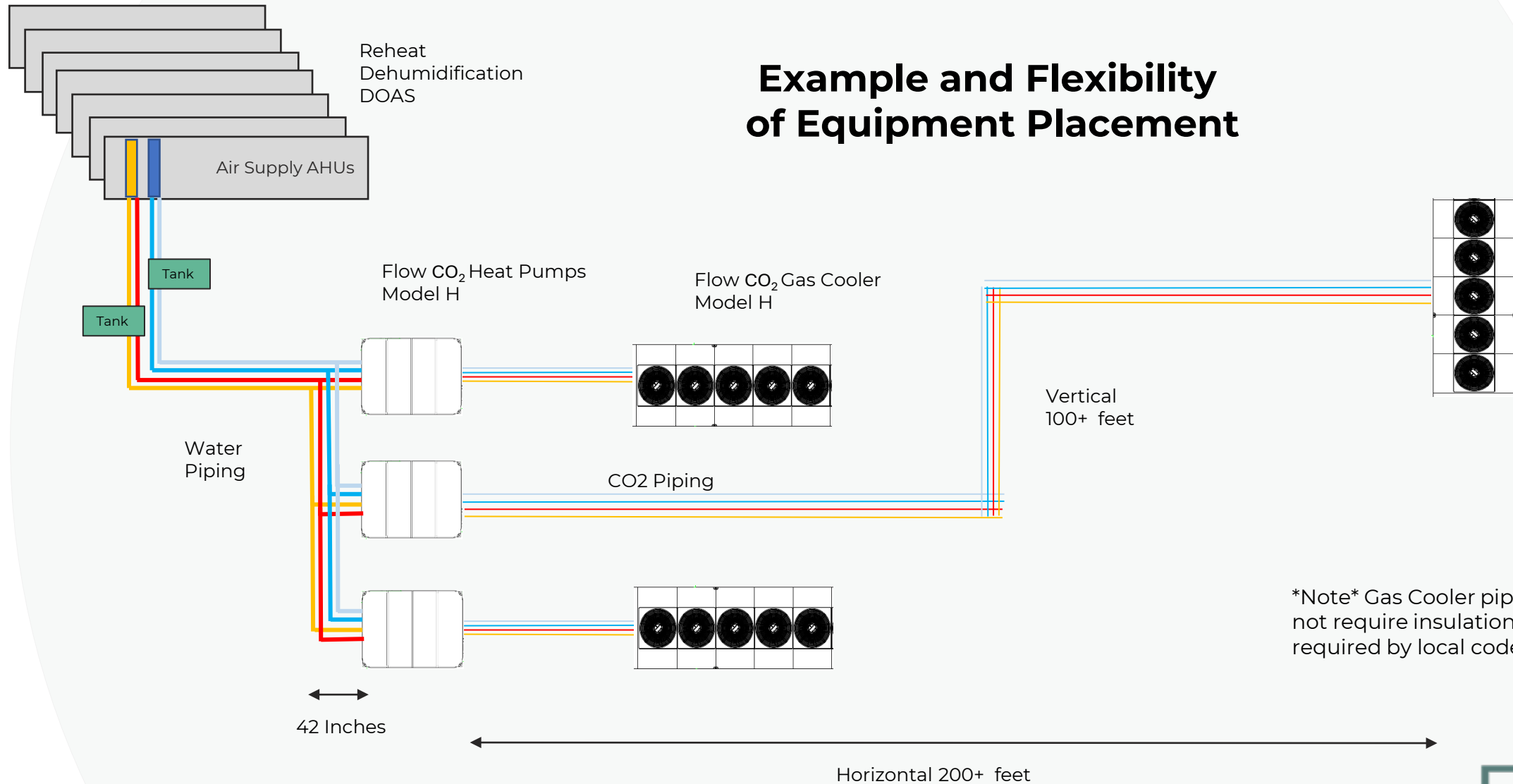
* Patent Pending

Flow

Advanced Heat Pump, Simplified Hydronics

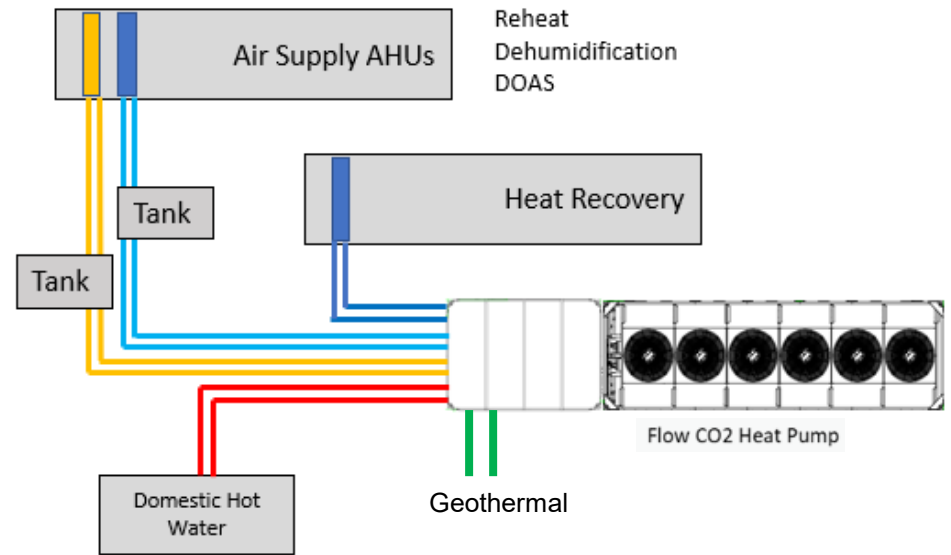
Flow

Example and Flexibility of Equipment Placement



Flow

Flow



Air Supply AHUs

Tank

Domestic Hot Water

- 20 F to 75 F Coolers and Freezers

Flow CO2 Heat Pump

- 20 F to 75 F Coolers and Freezers

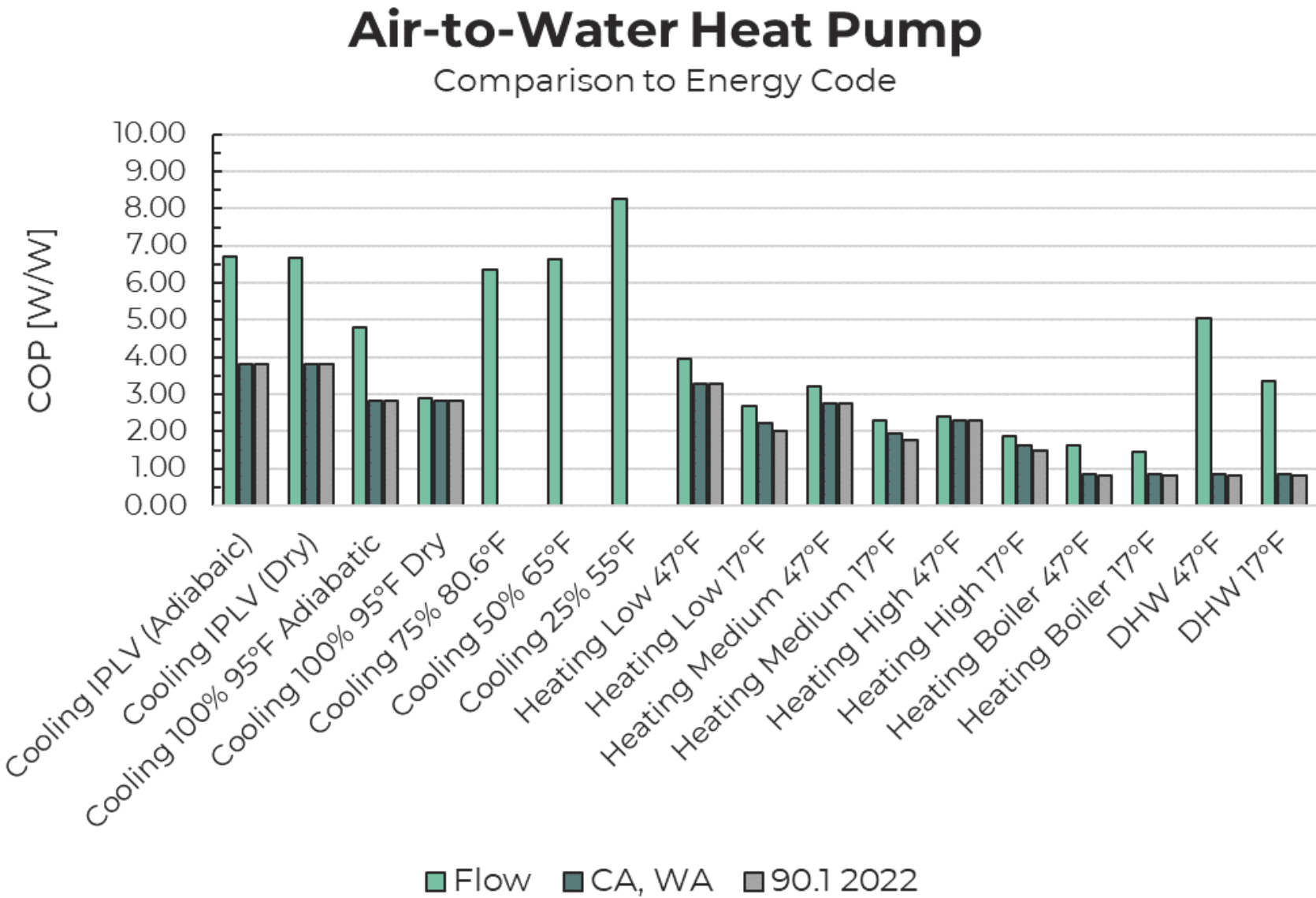
- Industrial
- Commercial
- Retail
- Office
- Grocery
- Manufacturing
- Medical
- Pharma / Lab

Flow

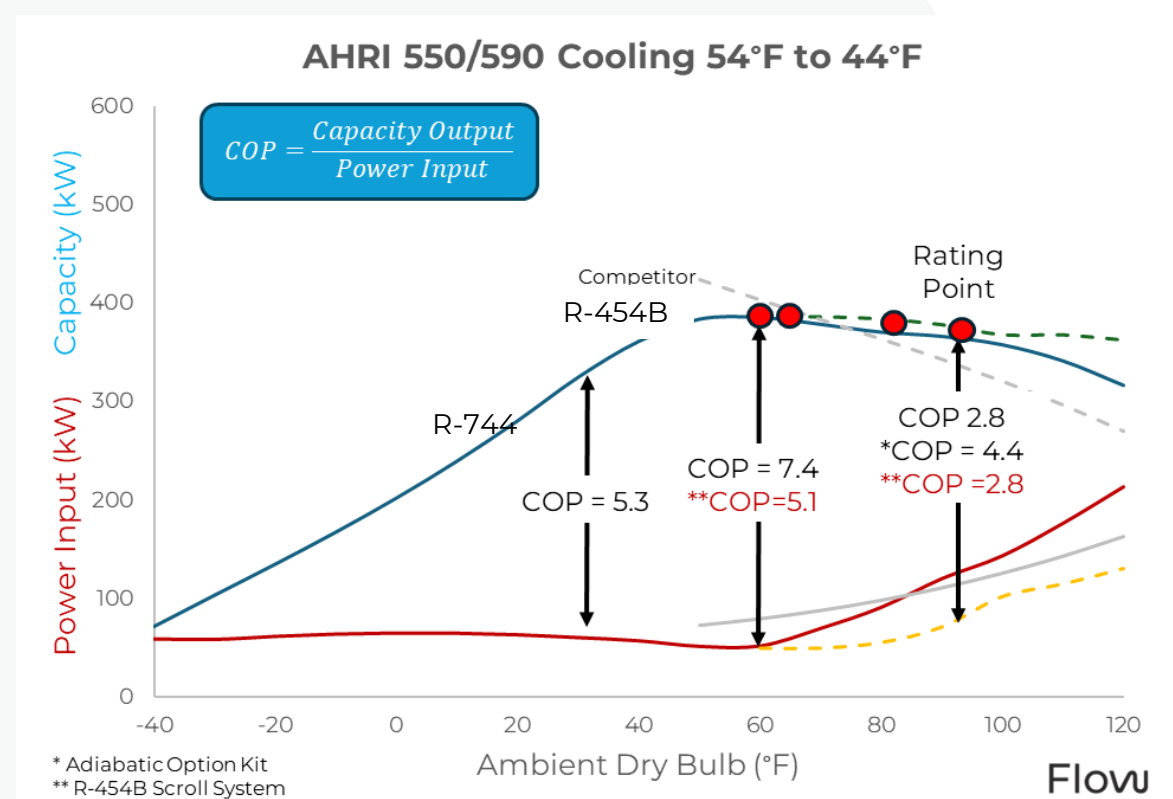
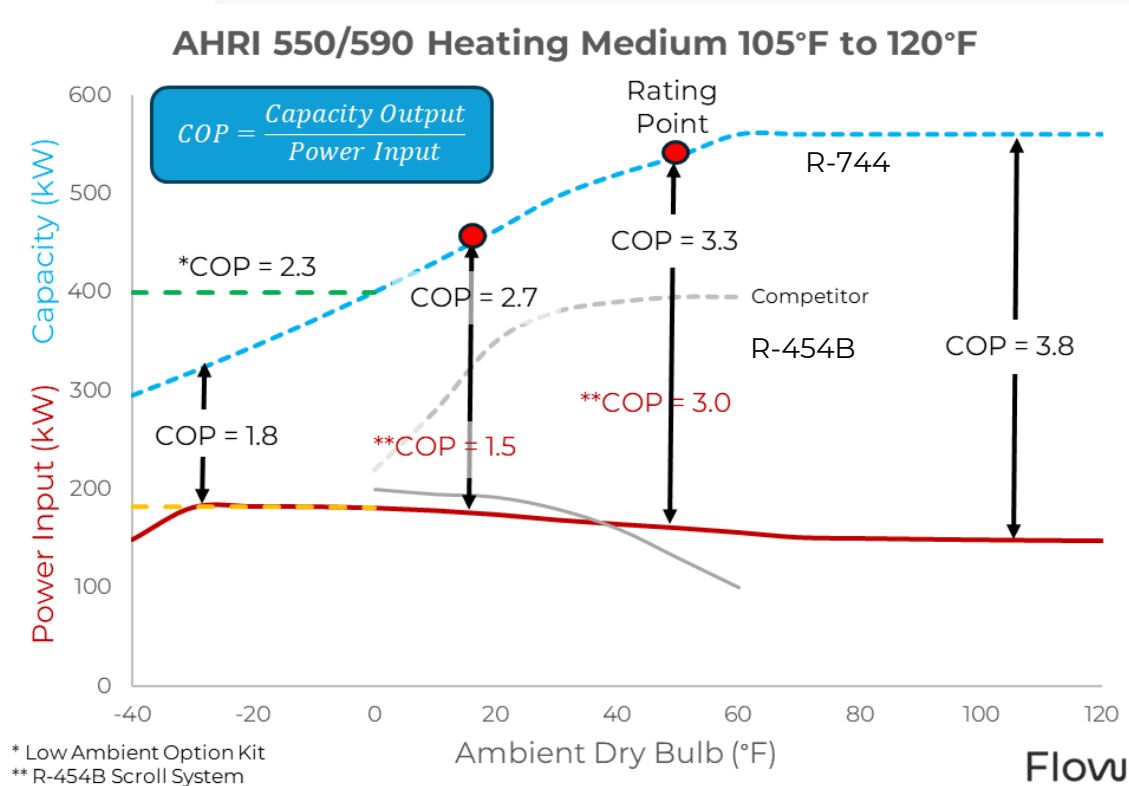
ANSWR Efficiency Versus Codes

Flow

Exceeds Energy Codes
For Heating & Cooling
Part Load Very Good



Efficiencies Gained: R744 (CO₂) vs R454B



Avoided Derates

Cold Climate Derate (30-100%)

New standards proposed - 30% derate at 5°F of 47°F rating condition.

Antifreeze Derate (8% to 21%)

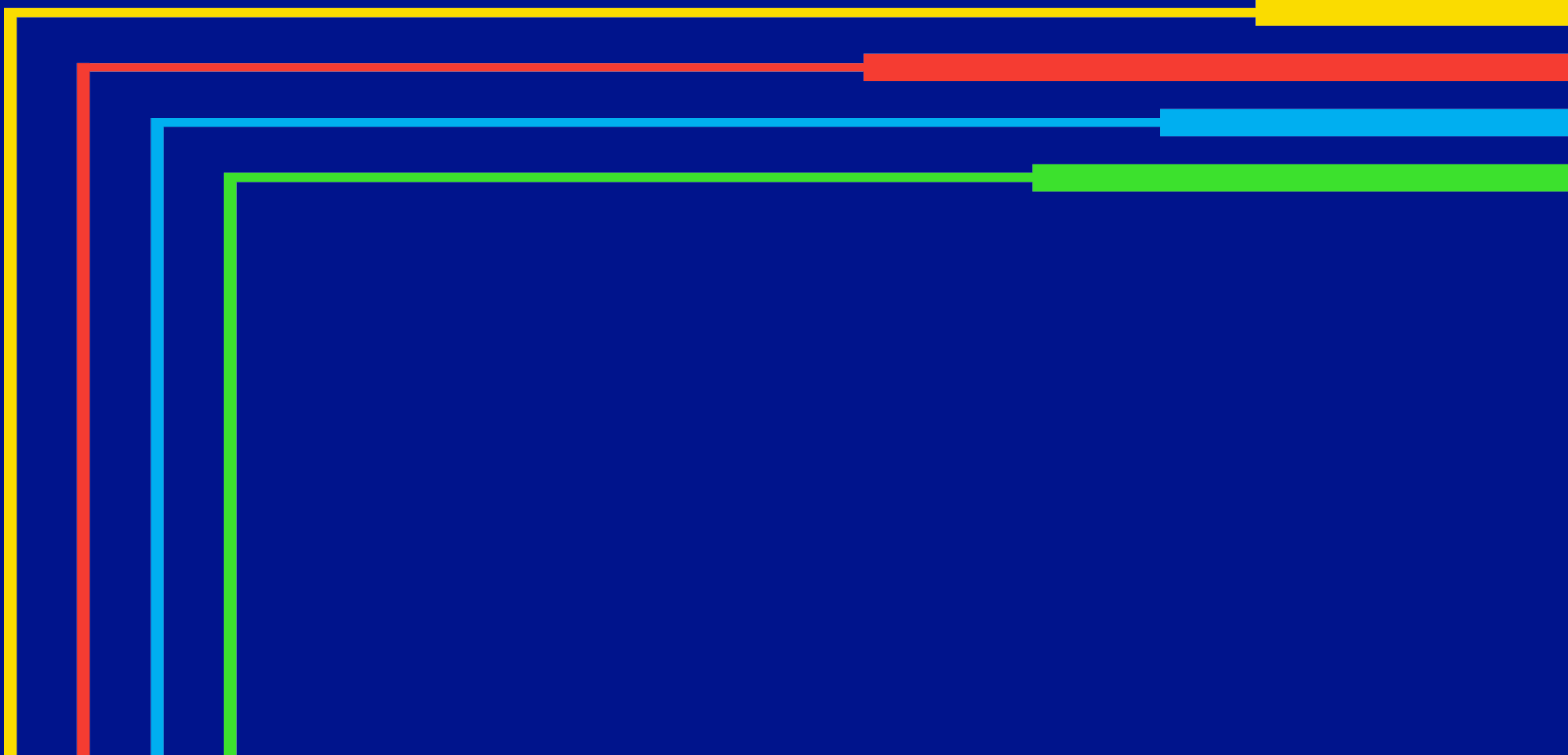
Defrost Derate (10-30%)

Flow

04

PEX Progress and Goals for 2025

Mathew McCarthy Mathew.mccarthy@nationalgrid.com

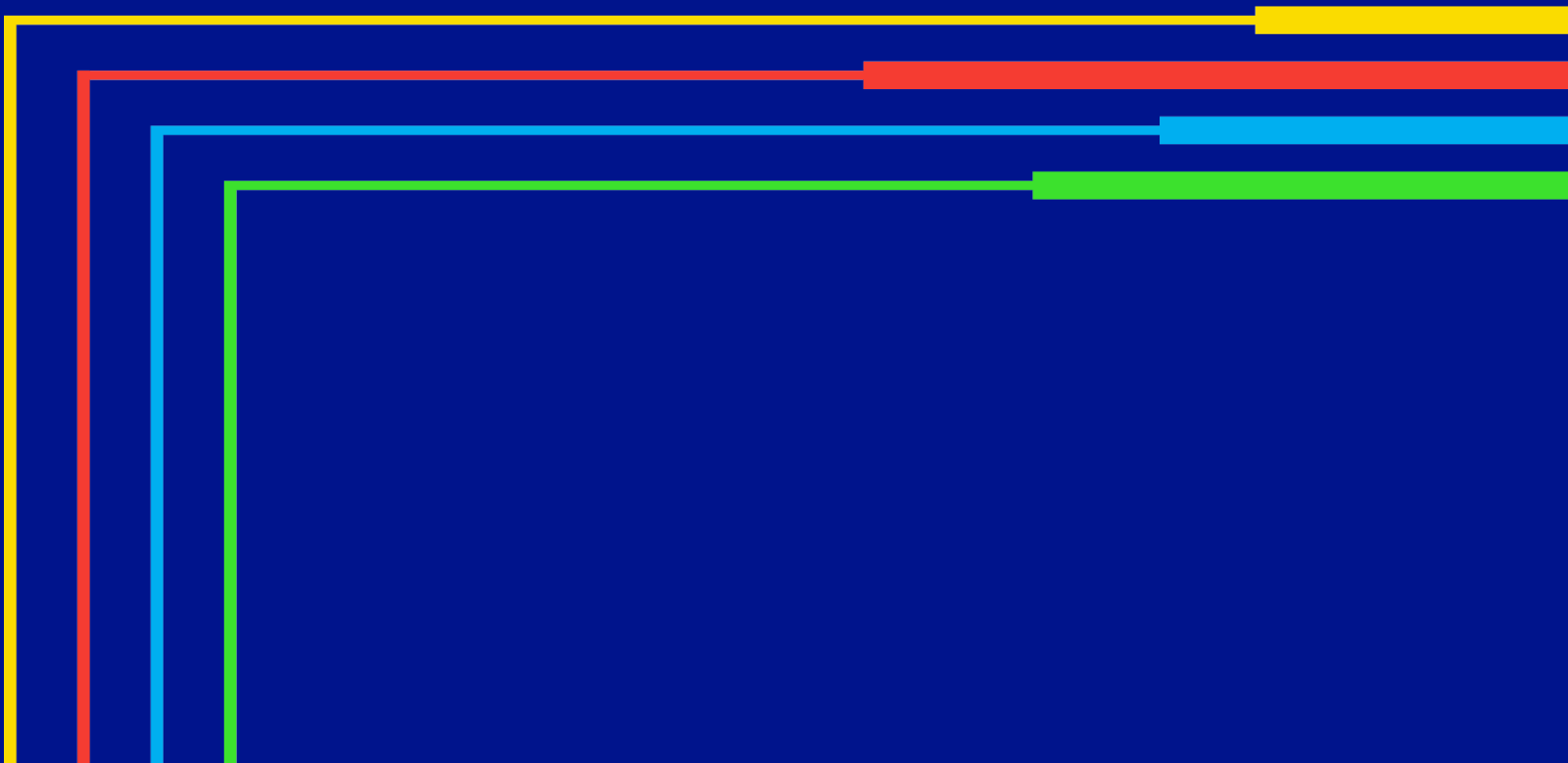


Key Performance Indicators	Goal	Paid	Paid % to Goal	Forecast	Forecast % to Goal
Electric Savings (NLT MWH)	85,600	40,200	47%	97,700	114%
Gas Savings (NLT Therms)	1,587,000	767,000	48%	1,835,000	116%
Electrification (NLT MMBTu)	37,900	25,000	66%	40,000	106%

05

Quick Hits/Reminders/2025 Meeting Dates

Mathew McCarthy Mathew.McCarthy@nationalgrid.com



Quick Hits/Reminders/2025 Meeting Dates

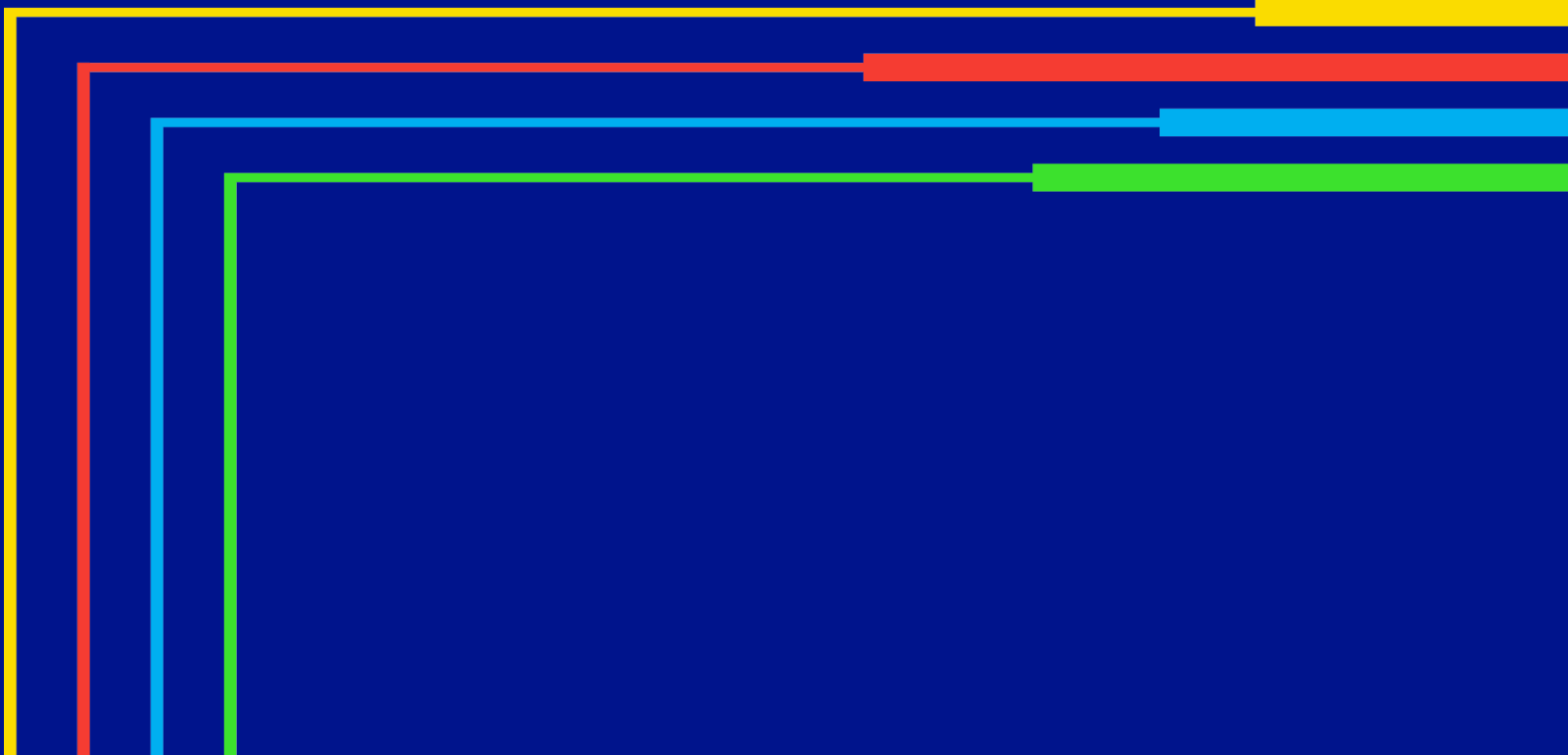
- **Upcoming Trainings/Events:**
 - Mass Save events and trainings can be found on the Mass Save website [here](#).
 - MAEEP
 - September 10: 8:30 am – 4:00 pm - [Commissioning of Existing Buildings \(EBCx\)](#)
 - September 30: 8:30 am – 4:00 pm - Upgrading to Heat Pumps from Existing Commercial HVAC Systems (Registration Link Coming Soon)
- **PEX Landing Page:**
 - <https://www.nationalgridus.com/MA-Project-Expediter-Program>
- **2025 Meeting Schedule**
 - September PEX Meeting – September 17th 9-10AM (Invite Sent)
 - October PEX Meeting – October 15th 9-10AM (Invite Sent)
- **2025 Energy Solutions Summit –10/23/25 from 8AM-6PM – Booths are available!**

Quick Hits/Reminders/2025 Meeting Dates

- **Lighting Updates**
 - Effective September 1, 2025, new, lowered incentive levels (163A and 165A are going to be \$70) will apply to Networked Lighting Controls (NLC) and LLLC controls for large commercial & industrial lighting projects. Projects with a signed Letter of Agreement (LOA) dated before September 1, 2025, and completed by December 31, 2025, will still qualify for current incentive levels. These updates do not impact products purchased via Midstream, or for Municipal or Small Business Turnkey projects.
- **One on Ones**
- **Custom Express Tools**
 - Please refer to the [Mass Save Business Rebates and Incentives page](#) for the latest rebate/incentive applications and custom express tools.

Thank You!

Be Safe



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