

Volume 1 Number 1



E360 Outlook

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and Air Conditioning Industries

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help fruit company save millions

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“If there is any one secret of success, it lies in the ability to get the other person’s point of view and see things from that person’s angle, as well as from your own.” — Henry Ford

Creating an Industry Dialogue



By John Rhodes

*President, Refrigeration
Emerson Climate Technologies*

These are interesting times. The pressures we face in the refrigeration industry feel increasingly intense, from impending regulatory changes to longer-term environmental impact concerns. Our ecosystem is more fluid than ever, with access to technologies that didn’t exist just a few years ago and a radically changing workforce demographic. A real and significant convergence of issues is occurring.

Meeting these challenges head on will be essential; solving them can’t be accomplished in isolation. The answers to our industry’s biggest challenges will start with conversations looking five, 10 and even 20 years forward. They will come from new, unconventional relationships. They will be the result of stakeholder connections that don’t exist today.

Based on this belief, Emerson Climate Technologies is committed to creating a better, more meaningful industry

dialogue — one that will lead to unique partnerships and tighter collaborations that think bigger, beyond the incremental changes that often characterize industry. We call it E360.

Through this platform, we’ll share perspectives on issues, trends and ideas that will drive our industry for decades to come. We hope you’ll find this information beneficial as you think about your individual or organization’s role in refrigeration. But our ultimate goal is much bigger: to use E360 as a platform to facilitate conversations and connections — from end users and OEMs to influencers and contractors.

As the E360 platform evolves, we hope you’ll feel comfortable being part of the conversation. Through various publications, online events and on-site forums, we’ll be getting the conversation started but also creating an environment where many perspectives and ideas can be heard. Consider this your invitation to take part.

As an industry, we have a lot to worry about. But we also have an opportunity to think differently in ways that encompass a collective viewpoint from every angle. We look forward to your perspective.



FIRST WORD



by CRAIG RANEY

Welcome to the inaugural edition of *E360 Outlook*

This quarterly publication is an important part of a larger platform, E360, which we will use to create a better, more comprehensive discussion about the issues we collectively face in the refrigeration industry.

Our market has become increasingly complex, with a multitude of challenges applying pressure from seemingly every angle: evolving and changing environmental standards; global warming; the growing ubiquity of digital technologies; food safety concerns; and never-ending energy and operating cost concerns.

In each issue of *E360 Outlook*, we will publish columns, stories and articles intended to inform, educate and provide unique perspectives on pressing issues and longer-term concepts.

In this first issue, we wish to take a deeper look at the refrigerant landscape. Global phase-downs (and even bans) of hydrofluorocarbon (HFC) refrigerants are part of an increasing effort to lower the global warming potential (GWP) in refrigeration systems. The passing into law of the F-Gas regulations in the European Union in April and the proposed changes to the listing status of several HFCs announced in July by the EPA will have significant implications.

Our cover story, “Making Sense of Natural Refrigerants,” looks at the reemergence of natural refrigerants, which often have little to no GWP, and their viability in commercial refrigeration systems. This issue also examines the July 9 release of the Environmental Protection Agency’s prepublication version of a Notice of Public Rule (NOPR), detailing proposed changes in the listing status of several common HFCs.

Each issue will also contain application stories, illustrating real-life problem solving from various corners of refrigeration. We hope the innovative approaches and unique collaborations highlighted in these stories will provide ideas and insights to positively impact your business.

Finally, on the back cover you’ll find numerous ways to connect with us so you can share your reaction to every issue or let us know what you would like to read more about.

Enjoy the first issue of *E360 Outlook* and welcome to the conversation.

Craig Raney

*Managing Editor, E360 Outlook
Director of Marketing, Refrigeration, Emerson Climate Technologies*

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Making Sense of Natural Refrigerants

Andre Patenaude, Director of CO₂ Business Development for Emerson Climate Technologies, gave an overview of the EU F-Gas Regulation, natural refrigerants and CO₂ system options, including secondary, cascade and transcritical, in a webinar on May 20. With regards to U.S. innovation, Patenaude stressed that manufacturers are making plans to design equipment to lower their GWP impact.

Natural refrigerant systems such as CO₂ are gaining market share as a future-proof refrigeration solution

As a result of the growing global interest in commercial CO₂ refrigeration systems, Emerson Climate Technologies has created a strategic initiative to provide the industry and its customers with information about utilizing CO₂ as a refrigerant. Patenaude's webinar presentation, summarized below, is part of this initiative.

It is targeted to end users looking at system architecture choices for the future. With lower GWP (global warming potential) impact, safety and training, capacity and energy, LCCP (Life Cycle Climate Performance), and compliance with upcoming regulation key priorities, natural refrigerant systems, such as CO₂, are gaining market share as a future-proof refrigeration solution.

Changes to European F-Gas regulation will have global impact

Commencing January 1, 2015, Europe will begin phasing down high GWP refrigerants. "The U.S. is not far behind," said Patenaude.

Some effects the European F-Gas phase-down, going into effect January 1, 2015, will have on commercial and domestic refrigeration markets are:

- Service and maintenance ban on all HFC refrigerants exceeding 2,500 GWP as of January 2020

- New equipment bans in domestic refrigerators and freezers as of 2015: maximum allowance refrigerants with 150 GWP
- New equipment bans in commercial refrigerators and freezers (hermetically sealed systems) as of 2020: maximum allowance refrigerants with 2,500 GWP (two years later this drops to 150 GWP)

For the supermarket industry, multipack centralized refrigeration systems for commercial use with a capacity greater than 40 kW (140 kBTU/hr) will be allowed a maximum GWP of 150 in 2022, except in the primary refrigerant circuit of a cascade system, where F-gasses with GWP of less than 1,500 may be used.

"The rest of the world is looking at this seriously, because as the equipment gets designed it gets pulled through other regions of the world," said Patenaude.

Regulatory changes proposed in the U.S.

The U.S., Canada and Mexico are presenting the North American amendment to the Montreal Protocol this summer, and the U.S. EPA has announced two rule-making changes, affecting new equipment only.

- First rule: approve new lower GWP fluids.

- Second rule: "change status" of R404A in multiplex supermarket refrigeration systems. In use today are R404A systems reaching a GWP level of 3,922 and R410A with around 2,000 GWP.

"As we look to the future and reducing GWP of gasses, one option is to move to mildly flammable refrigerants, and as manufacturers we have to prepare for this," said Patenaude. "The reason why manufacturers are looking at these is because it is pretty much a future-proof option," he continued.

Secondary, cascade and transcritical CO₂ systems

R744 (CO₂), used back in the 1920s before other synthetics were invented, is a high-pressure refrigerant with zero ODP and a GWP of 1. It is non-toxic, non-flammable and odorless, and is heavier than air (will settle at lowest level). Smaller line sizes are used because of its lower viscosity and CO₂ is less sensitive to pressure drops. CO₂ is cost-effective, and depending on environment and system design, can perform better than HFCs.

Cascade subcritical CO₂ and secondary systems (liquid recirculation) are usually used in high ambient areas, such as southern Europe, mid-to-southern U.S., and much of central South America, Asia, Africa and

Australia. The high side of a CO₂ secondary system can either be ammonia or HFCs. The CO₂ would typically be cooled to -28.8 °C (-20 °F) 200 psig for the LT load and -6.6 °C (+20 °F) 407 psig for the MT load. In a cascade system, the low stage provides the cooling load and uses CO₂.

Transcritical systems are usually used in areas where the ambient temperature is generally low (below 25 °C / 77 °F), such as northern Europe and Canada, and northern U.S. New product development and system designs are allowing for improved efficiency in warmer climates. A CO₂ booster refrigeration system using transcritical compressors can work in a transcritical or subcritical range. High side pressure ranges from 800 to 1,740 psig, medium side from 350 to 500 psig, and low side from 175 to 250 psig.

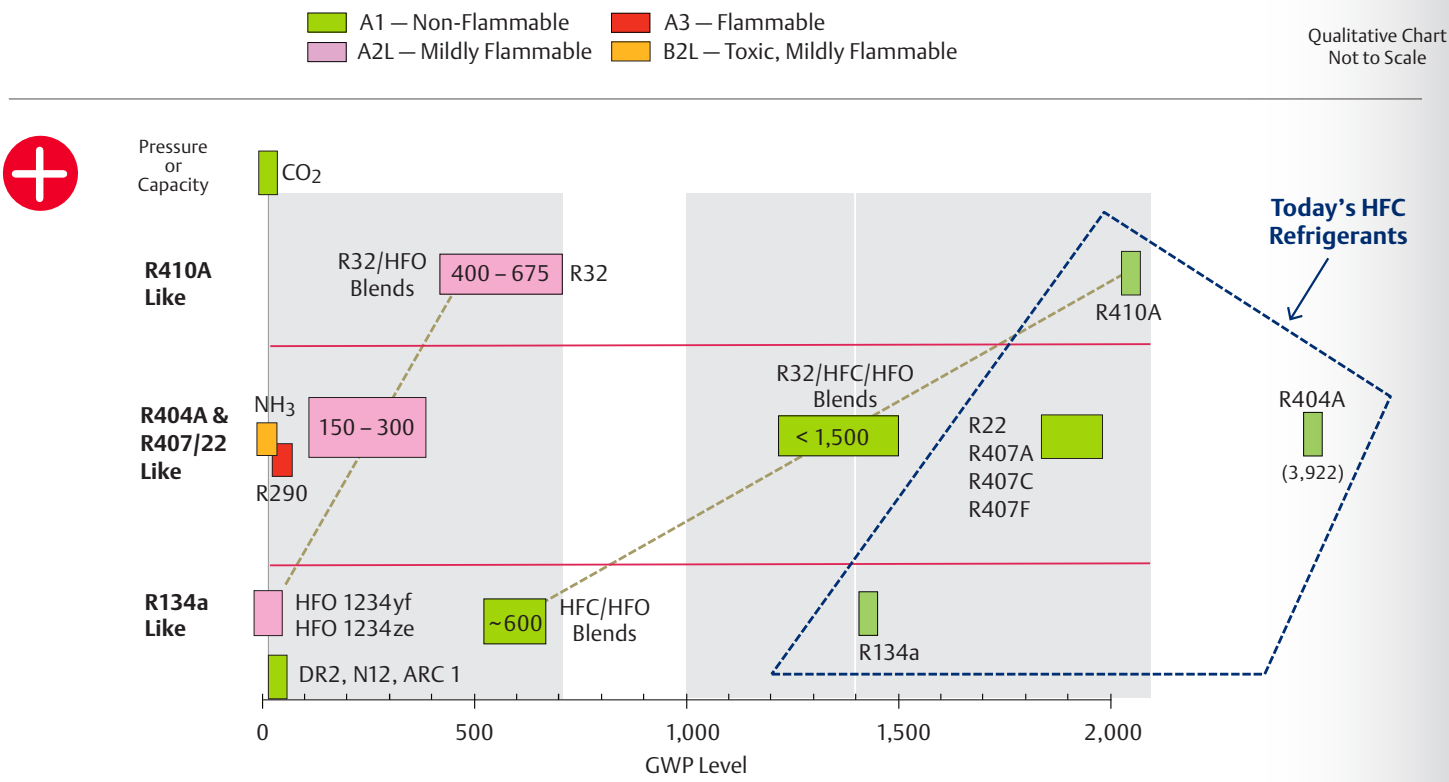
Looking at a chart developed by market development expert shecco™ in 2013 representing the number of global CO₂ cascade/secondary and transcritical stores found worldwide, colder climates clearly lead the world in CO₂ transcritical refrigeration systems, with close to 70 system installations in supermarkets in North America expected by the end of 2014, and more than 2,885 already in northern Europe.

Map of CO₂ Transcritical and CO₂ Cascade/Secondary Stores Worldwide in 2013



This article originally appeared on R744.com in June 2014 and is reprinted with permission.

Refrigerants Landscape



Weighing up other natural refrigerant alternatives

R290 (propane) is classified as A3 by ASHRAE: a non-toxic and flammable refrigerant, with ODP of zero and a GWP of 3. Hydrocarbons are environmentally benign refrigerants and have low discharge temperatures compared to HCFCs and HFCs, thus improving system reliability. Hydrocarbons offer an approximately 40 percent reduction in charge compared to R22 and R134a. Pressures are similar to R22; however, a system must be specifically designed to use hydrocarbon refrigerants.

“Propane applications will grow, especially in the smaller sizes, as safety in service will be important for adoption,” said Patenaude.

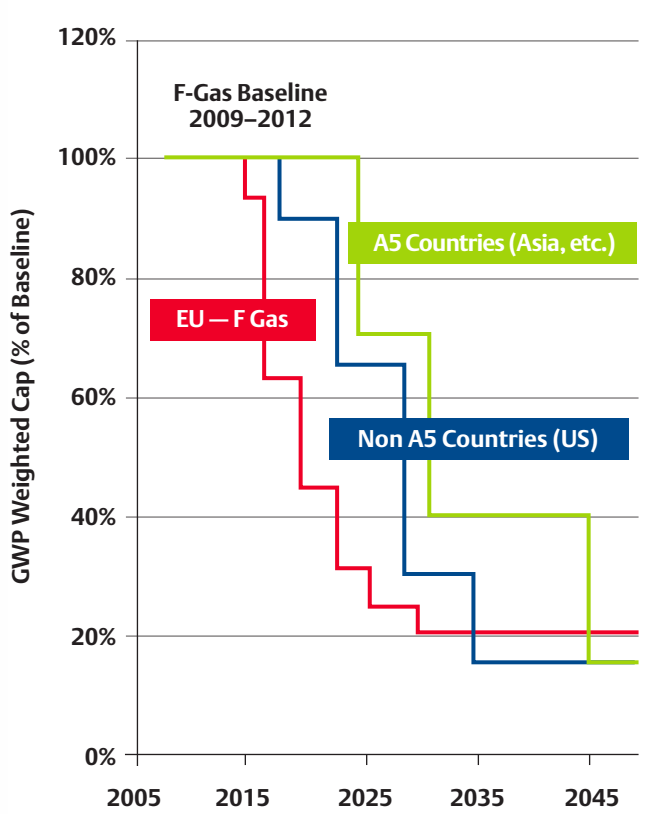
R600a (isobutane) is used in 95 percent of domestic refrigerators and freezers in Europe today, and countries like Argentina, Brazil and China are following. Millions of pieces of light commercial equipment use R290 and R600a (as well as CO₂) worldwide, with early adopters of the technology being The Coca-Cola Company, Unilever, Red Bull and PepsiCo.

R717 (ammonia) is an abundant and affordable refrigerant, which has been used for years in large capacity industrial systems. It is lighter than air, breaks down rapidly in the environment, and has zero ODP and zero GWP. R717 is up to 25 percent more efficient than HFCs, has excellent heat recovery and low leakage. In case of leakage, due to its toxicity, it is identified and addressed rapidly. Applications for R717 include: food and beverage; cold storage; recreational ice; ground freezing in mining; district heating and cooling; and heat pumps.

Although hydrocarbons and ammonia have their application challenges, their uses continue to increase in specialized applications.

The rest of the world is looking at Europe seriously, because as the equipment gets designed it gets pulled through other regions of the world.

Europe’s New F-Gas Phase-Down and Bans Go Into Effect January 1, 2015



Service and maintenance bans	GWP	Timing
HFC's	2,500	Jan. 2020
'Placing on the market' (new equipment) bans		
Domestic refrigerators and freezers	150	Jan. 2015
Refrigerators and freezers for commercial use (hermetically sealed systems)	2,500	Jan. 2020
Refrigerators and freezers for commercial use (hermetically sealed systems)	150	Jan. 2022
Stationary refrigeration equipment (except equipment for temperatures below -50 °C)	2,500	Jan. 2020
Multipack centralized refrigeration systems for commercial use with a capacity of ≥ 40 kW (140 kBTU/hr) (except in the primary refrigerant circuit of cascade systems, where fluorinated greenhouse gases with a GWP of less than 1,500 may be used)	150	Jan. 2022
Movable room air-conditioning appliances (hermetically sealed equipment which is movable between rooms by the end user)	150	Jan. 2020
Single split air-conditioning systems containing < 3 kg	770	Jan. 2025



For more information, visit our webinar at www.emersonclimate.com/makingsensewebinars



FRESH OFF THE BOAT

Energy-efficient compressors help a top banana company save millions

Here's a business model that could drive any company bananas. Imagine you sell a commodity every country in the world wants but that only grows in a few places on earth. It's so fragile it must be refrigerated the moment it's harvested. Then it has to ride a truck to port, cross the ocean, pass through a distribution warehouse, and take a final road trip to the store. A temperature change of just a few degrees either way will ruin the entire load.

Oh, and did we mention you have a razor-thin profit margin?

That's the daily reality faced by Dole Food Company, Inc., the world's largest producer and marketer of fresh fruits and vegetables. Thanks to recent improvements



in shipping technology, however, Dole's top bananas are sleeping more soundly, saving money on fuel and spoilage while reducing their carbon emissions.

Getting there is more than half the battle

Thirty-seven billion pounds of bananas are shipped globally each year, making bananas the world's most popular produce. While bananas are consumed in every country on earth, they are only grown in a few. So, they must travel thousands of miles before arriving at your local grocery store.

Successfully transporting bananas is no easy task. In the field, bananas are first loaded into refrigerated containers that must be quickly brought to 58.0 °F

(14.4 °C). If the temperature drops even a few degrees below this ideal temperature at any time during shipping, the banana skin will develop dark spots and will not ripen properly. If the temperature rises a few degrees, premature ripening and shrinkage occurs.

Throw in the harsh weather conditions frequently encountered by seagoing vessels that carry perishable product containers, and it's easy to see why tight temperature and humidity control are critical to protecting quality. In the food industry, where profit margins are particularly narrow, degradation of product at any point in this process is a recipe for significant financial loss.

Technology to the rescue

In the last decade, major innovations in compressor technology have changed the way Dole and other major food shippers do business. At the turn of the 21st century, less than 5 percent of all refrigerated

container users employed scroll compressors, but today that number has risen to more than 50 percent. That's because shippers like Dole and many others are finding that scroll compressor technology helps them better protect their valuable perishables, save on energy costs and deliver environmental benefits.

Today's state-of-the-art refrigerated seagoing containers are equipped with digitally modulated scroll compressor technology that provides precise temperature and humidity control. They have been shown to maintain temperature to within +/- 0.5 °F (+/- 0.3 °C), which is particularly critical for perishable products like fruits and vegetables.

Dole switched almost exclusively to the use of refrigerated container systems equipped with digitally modulated scroll compressors in 2005 to rapidly remove heat from containers. At the point of harvest in the field, the digital modulation "pulls down" the temperature to the ideal level

up to 25 percent faster than traditional compressors, and enables a 46 percent more energy-efficient method for maintaining temperature control throughout the remainder of the bananas' journey.

As an added benefit, the compressors used by Dole and others are smaller and lighter (95 pounds) than typical semi-hermetic compressors, which weigh around 325 pounds. That leaves room for a few more bananas in every container.

An appealing bottom line

While Dole hasn't released precise figures of its own savings, industry experts estimate that the use of energy-efficient compressors in refrigerated containers can enable the banana industry to save more than \$10 million in fuel costs and reduce shrinkage and spoilage by \$500 million annually. In addition, scroll compressors already have a proven track record of reducing carbon emissions related to banana transportation by 15 percent. 🌱



Cold and Calculated

Canadian grocery chain creates cold storage facility with zero global warming impact



Niloo/Shutterstock.com



The warehouse holds nearly
600 varieties of fruits and vegetables

Keeping a 240,000-square-foot warehouse chilly without depleting the ozone layer or warming the planet may sound like a tall order, but Metro Inc. isn't sweating it.

Rapid growth can be a mixed blessing for an organization that takes its environmental responsibilities seriously, but growing pains aren't stopping Metro Inc. from staying the course. The company has been working continuously to improve its environmental record since 1998, most recently in the expansion of its main cold storage distribution warehouse.

With annual sales exceeding C\$11 billion and more than 65,000 employees, Montreal-based Metro Inc. is a leader in the food and pharmaceutical sectors in Québec and Ontario, where it operates a network of more than 600 food stores and over 250 drugstores.

As Metro's steadily increasing retail operations made it necessary to expand its primary facility for storing cold food and dairy products, the company considered the upgrade to an efficient and safe refrigeration system just as important as meeting its capacity needs. The end result was a win-win-win solution that also enabled significant savings of both capital and ongoing operational costs.

Balancing efficiency, safety and responsibility

To meet the diverse challenges of the expansion, Metro reached out to CIMCO, an international leader in industrial refrigeration, food and beverage cold storage; and Dessau, one of Canada's largest engineering and construction firms.

Metro takes its duty to respect and protect the environment very seriously, performing annual environmental audits of all their Québec and Ontario warehouses. With that in mind, the designers wanted to make sure this facility would be able to meet or exceed Metro's requirements for years to come.

It was clear from the outset that hydrofluorocarbon (HFC) refrigerants, known for their high global warming potential (GWP), would be out of the question. Instead, the project team developed a design incorporating a dual-temperature, low-charge ammonia package refrigeration system.

Natural ammonia is a non-ozone depleting refrigerant with zero global warming impact. Low-charge ammonia systems like the one applied for Metro are growing in popularity for large-capacity cooling applications in the 75–750 kW range. This is partly because of their efficiency, but also because the low ammonia refrigerant charge improves safety and reduces certification costs. Safety is further enhanced by completely isolating the ammonia from the warehouse. Only a secondary refrigerant—cooled CO₂ brine—is pumped into the cold storage space.

To maximize part-load efficiency and keep costs to a minimum, the team also made it a priority to find an efficient compressor system that would eliminate the need for costly variable frequency drives.



Saving energy — and operational costs

Another key benefit of the system is the ability of its single-screw slide valves to ensure optimum part-load performance, matching any fluctuations in refrigeration load. This combination eliminates the need for expensive inverter drives and their inherent electrical issues, improving part-load performance while saving energy and money.

In the case of the Metro project, dual-slide valve efficiency avoided C\$100,000 of capital cost for variable frequency drives. With an amount of ammonia of about 0.12 kg/kW, the secondary circuit met another of Metro's crucial requirements: to minimize the total amount of ammonia used on-site.

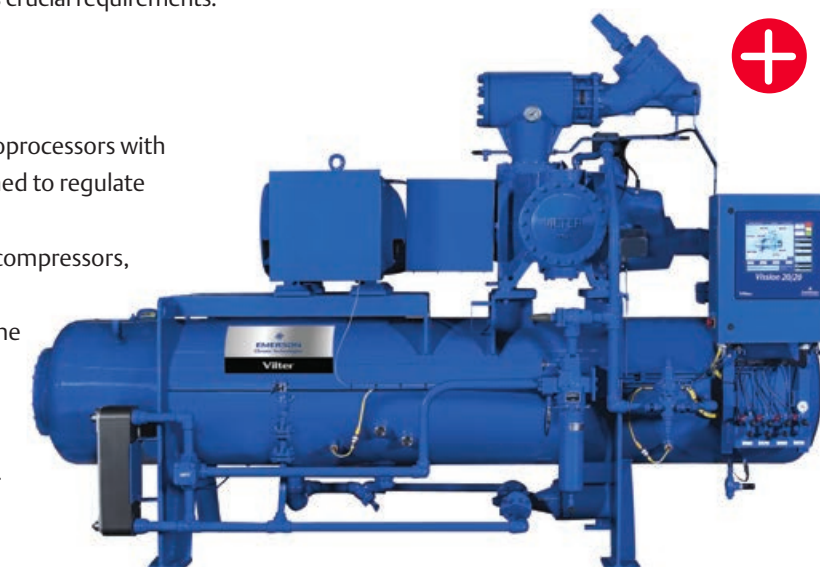
Optimized for performance

Fine-tuning the function of the entire unit are microprocessors with process temperature controls. These controls are designed to regulate starting, stopping and capacity control.

Combined with the dual-slide design on the screw compressors, this setup allows the system to function in a range of 20 to 100 percent of flow while continuously operating at the ideal compression ratio throughout the part-load range. This allows the compressor to match the system flow requirements to make cooling as low-cost and efficient as possible, operating at an estimated 15 percent higher efficiency than comparable technologies.

The new Metro C\$50 million produce and dairy products distribution center

VSS 601 refrigeration compressor unit





Preparing for the **next generation of refrigerants**

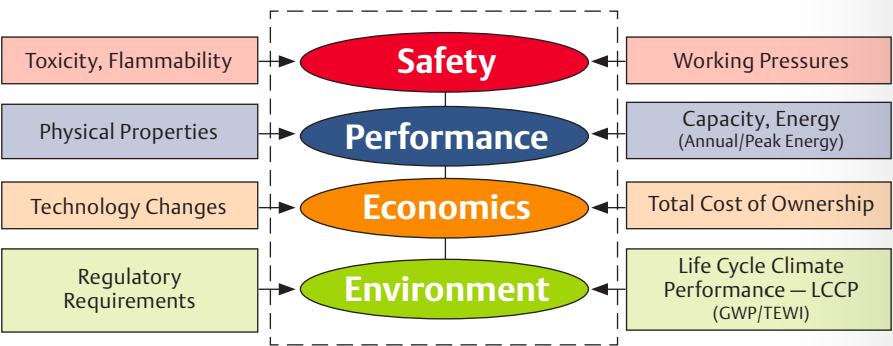
No issue is more pressing to the supermarket and foodservice industries than the topic of refrigerants and their Global Warming Potential (GWP). Today, acceptable refrigerants and the regulations drafted to phase down those containing HFCs are in a state of flux. This places retailers, OEMs and component manufacturers in the unenviable position of selecting refrigerant/equipment combinations that will serve their businesses into the foreseeable future.

A primary reason behind the current sense of urgency is the EPA's recent announcement of its significant new alternatives policy (SNAP) and subsequent notice of public rulemaking (NOPR) regarding acceptable refrigerants used in retail refrigeration applications. The EPA's moves come on the heels of their 2013–2014 meetings held with stakeholders to discuss the global warming potential (GWP) of HFC-based refrigerants and explore which ones could be delisted.

If you work with refrigerated reach-in and walk-in cases and think SNAP's proposed changes will not impact you, think again. SNAP has identified two of our industry's most common refrigerants — R404A and R507A —for delisting in new and retrofit applications by early 2016. In self-contained, stand-alone systems, such as vending machines, R134A is also a candidate for delisting.

While the proposed phase-outs do not give us much time to prepare, there are several things we can start thinking about today. First, the NOPR gives all stakeholders until October 6 to comment in the Federal Register on SNAP's

proposed delisting of refrigerants. If you have concerns, unique equipment and application requirements, or disagree with the proposed delistings, this is your chance to make your opinions known to the EPA. Failure to comment is the equivalent of tacit agreement with current SNAP rulings as they have been drafted.



When assessing the next generation of replacement refrigerants, the supermarket and foodservice industries should strive to minimize unintended consequences, maximize performance efficiencies and simplify the transition process. I believe we can achieve these goals and meet the EPA's proposed timeline through a holistic evaluation of key criteria:

- Safety — understand the toxicity, flammability and pressure implications
- Performance — consider the capacity and energy efficiency potential
- Economics — estimate the total cost of ownership and viability of technology changes
- Environment — ensure EPA compliance and reduce GWP

As a component manufacturer, Emerson Climate Technologies has been

busy evaluating options that strike a balance among these factors and adhere to SNAP's proposed ruling on refrigerants. Having participated in the EPA's discussions for quite some time, we have anticipated SNAP's policy changes and have diligently attempted to stay ahead of the curve.

In fact, we've already identified viable natural and synthetic refrigerant replacements, including: R407A/F, CO₂ and R290. We are making every effort to not only stay well-informed of the EPA's proposed rulemaking, but also to prepare products well in advance of its 2016 timeline.

For more information on SNAP and NOPR, please visit our Making Sense website and download my recent webinar on this subject: www.emersonclimate.com/makingsensewebinars

Dr. Rajan Rajendran is one of the most respected, global authorities on alternative refrigerants and their applications across a variety of industries. As Emerson Climate Technologies' Vice President, System Innovation Center and Sustainability, Rajan helps steer the company's strategic direction, research and product development.

Making Sense of refrigerants, operational visibility and energy-reduction technologies.

Since early 2013, Emerson Climate Technologies has produced a series of free webinars with the goal of Making Sense of the most important issues in refrigeration. This educational platform addresses current trends and focuses on three key aspects of refrigeration:

- The promising role of new and natural refrigerants
- The application of electronics to improve operational visibility
- Energy-reduction technologies

In our most recent webinar, Emerson's own Rajan Rajendran was joined by prominent chemical manufacturers to discuss the EPA's SNAP announcement and evaluate potential future refrigerants. The upcoming tenth webinar in this series will explore the impacts of the DOE's final energy efficiency rule on walk-in coolers and freezers.

Webinar Schedule		
Staying Ahead of DOE 2017 Walk-In Cooler and Freezer Energy Efficiency Ratings		Oct. 21, 2 p.m. EDT
Register at: www.emersonclimate.com/makingsensewebinars		
Recently Archived Webinars		
Staying Ahead of Rulemaking Proposals on Acceptable Refrigerants		August 26, 2014
Improve Refrigerated Marine Container Management With Pervasive Connectivity		July 8, 2014
Making Sense of Natural Refrigerants		May 20, 2014
Best Practices for Evaluating Compressor System Performance		March 11, 2014
A Conversation on Refrigerants!		January 21, 2014



ecoSYS — complete facility control and chain-wide consistency



Control

Controlled Shopping Environment

Facility Insight

If you think you're seeing a lot more prepared and fresh foods in your local convenience stores, it's not your imagination. It's part of a growing trend.

The traditional money makers for convenience stores — tobacco and gasoline — are producing lower margins than ever. And seemingly everyone has added "convenience" to their portfolio, as grocery stores, pharmacies and dollar stores extend hours and add product categories.

To combat these pressures and generate the profits needed to fund future growth, convenience store operators small and large are turning to enhanced foodservice offerings that include higher-end fresh and prepared foods.

To date, the strategy is working. Not only has foodservice grown rapidly within the U.S. convenience store segment last year, it accounted for 18.0 percent of in-store sales and a whopping 29.1 percent of in-store profits.¹

Despite this success, chain operators still face many challenges. Consumer expectations are different for higher-end prepared and fresh foods, and the convenience store market still has image issues to overcome. In fact, 33 percent of consumers who haven't purchased food

from a convenience store haven't done so because they perceive the food to be lower quality.²

Overcoming perception issues and closing the food experience gap versus long-established fresh food competitors won't be easy.

- Most chains have a variety of store configurations, sizes and systems across their enterprise.
- Increased customer-facing demands on associates leave little time for manual monitoring, setting and controlling the systems that affect the customer experience.

So how does a convenience store create a high-quality, consistent shopping experience that encourages fresh food purchases across dozens or hundreds of stores?

Enter Emerson Climate Technologies. By combining Emerson's expertise in HVAC and refrigeration with a new control offering from Retail Solutions, Emerson is better positioned than ever to engage this key retail segment. The new ecoSYS control offering is a highly flexible distributed control platform that allows retailers to economically deploy enterprise class controls for store optimization and remote visibility to what is happening in their stores.

Today, the system is capable of managing refrigeration and HVAC units as well as lighting systems, while collecting important performance information like refrigerated case temperatures and energy usage data for trending and reporting. With a distributed approach to controls, customers can add to their system as their needs change.

Not only can the ecoSYS platform help safeguard food quality through refrigeration monitoring and control, it can also maintain a quality shopping experience by ensuring lighting and store temperatures are always ideal.

The ecoSYS platform includes extended, optional capabilities that enable enterprise-level visibility and site management. This allows retailers to maintain store-to-store consistency, provide insight for service teams, and relieve store associates of routine system setting and maintenance tasks so they can focus on customer service.

Initially designed for convenience store, restaurant and small format retail operations, ecoSYS will soon include capabilities for supermarkets, including robust integration with existing facility control systems. It's an exciting new platform that addresses many of the most pressing concerns in foodservice and food retail.



Emerson Climate Technologies is excited to take our new educational platform on the road through our interactive E360 Forums. These quarterly, daylong events will be held in strategic locations across the country and feature prominent refrigeration industry authorities as well as Emerson's own internal experts.

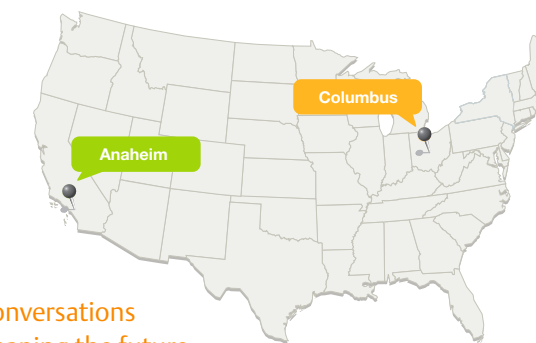
The E360 Forums will give attendees an opportunity to participate in conversations shaping the future of refrigeration. Our first event will be held this November in Columbus, Ohio. We hope to see you there!

E360 Forum Schedule

Columbus, OH November 13, 2014 Hilton Polaris

Anaheim, CA February 18, 2015 Embassy Suites Anaheim

Additional 2015 venues to be announced



Join the conversations that are shaping the future of refrigeration at an interactive, educational **E360 Forum** near you.

Addressing the Challenges Facing Foodservice and Supermarkets

The foodservice and supermarket industries are in a dynamic transition driven by regulatory and market forces. Between the Department of Energy's recent ruling on the regulation of energy consumption in walk-in coolers and the Environmental Protection Agency's latest refrigerant delisting proposal, OEMs and retailers will be tasked with achieving compliance within the next two years.

Meanwhile, refrigeration-related equipment remains one of the largest segments in foodservice. And, industry experts are forecasting consistent short- and long-term growth in this segment as retailers expand into new venues and re-equip refrigeration units in existing facilities.

Forum Speakers

In our very first E360 Forum, we will discuss this unique confluence of conditions that poses significant challenges to foodservice and supermarket OEMs and retailers. Our expert panel will shed light on these issues and help chart a path forward. **John Rhodes** will kick off the event with opening remarks. A keynote address by **Robin Ashton**, president and publisher, *Foodservice Equipment Reports*, will provide insight on the current trends in foodservice. Then, **Rajan Rajendran** will deliver a keynote address, followed by breakout sessions led by experts in regulations, equipment and facility management. We hope you can join this timely and informative session!

Visit www.emersonclimate.com/e360-event-registration to register for a forum near you.

INDUSTRY EVENTS

AHRI 2014 Annual Meeting

Carlsbad, CA
La Costa Resort & Spa
November 16–18, 2014
www.ari.org

2014 HARDI Annual Conference

San Antonio, TX
JW Marriott San Antonio Hill Country
December 6–9, 2014
www.achrnews.com/events/609-hardi-annual-conference

NWFPA Expo + Conference

Portland, OR
Oregon Convention Center
January 12–14, 2015
www.nwfp.org

FMI Midwinter Executive Conference

Miami Beach, FL
Fontainebleau Miami Beach
January 24–27, 2015
www.fmi.org/mw2015

2015 AHR Expo

Chicago, IL
McCormick Place
January 26–28, 2015
www.ahrexpo.com

The NAFEM Show

Anaheim, CA
Anaheim Convention Center
February 19–21, 2015
www.thenafemshow.org

1. Source: National Association of Convenience Stores (NACS) 2. Source: C-stores Raise the Bar on Convenience Foods, Kelly Hansel, Institute of Food Technologies



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We'd like to hear your feedback.



Thank you for reading the first edition of *E360 Outlook*! At Emerson, we believe the challenges faced by the refrigeration industry cannot be solved in a vacuum. Only through collaboration and a commitment to innovation will we discover answers to the difficult questions before us.

We hope the information provided here will spark conversations and open all of our eyes to new perspectives. But for that to happen, we all need to contribute. And that starts with you. Feel free to contact us with your feedback, questions and insights. We look forward to hearing from you.


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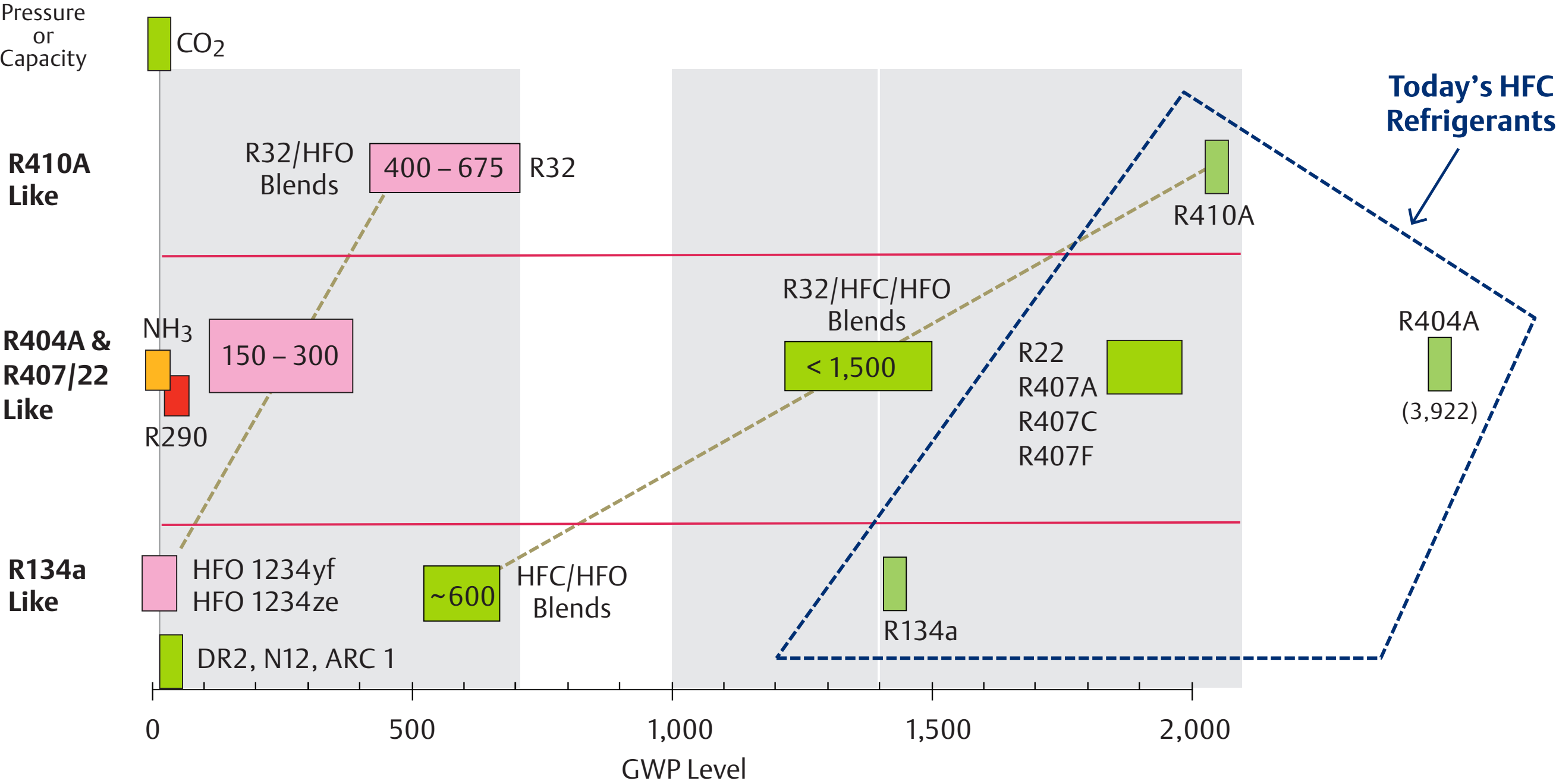
Map of CO₂ Transcritical and CO₂ Cascade/Secondary Stores Worldwide in 2013



Refrigerants Landscape

- A1 — Non-Flammable
- A2L — Mildly Flammable
- A3 — Flammable
- B2L — Toxic, Mildly Flammable

Qualitative Chart
Not to Scale



VSS 601 refrigeration compressor unit

