

## The Smart Warehouse

COVER  
STORY  
12

AI promises greater efficiencies and ROI in cold chain logistics.

08

Developing the Global Cold Chain

16

A Professional Network

22

Sharing the Chill

26

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## DEPARTMENTS

- 32** Cold Chain Development
- 34** Cold Chain Federation Corner
- 36** Cool Solutions
- 42** Member News
- 44** Calendar
- 46** Association News
- 48** New Members
- 54** Ad Index

## COLUMNS

- 6** Leadoff
- 53** Cool Person



### About the Cover

Artificial intelligence in cold storage and logistics holds the promise of optimized operations, increased efficiency, reduced costs and improved customer satisfaction. See the article on page 12.



## FEATURES

**08**

### Developing the Global Cold Chain

GCCA Farm Bill Initiative introduced in the U.S. House and Senate.

*By Lowell Randel*

**12**

### The Smart Warehouse

AI promises greater efficiencies and ROI in cold chain logistics.

*By Alexandra Walsh*



**16**

### A Professional Network

Cold storage industry architects and engineers benefit from new Women in CEBA program.

*By Gina Veazey*

**22**

### Sharing the Chill

Primus Builders delivers first spec cold storage warehouse in Dallas.

*By Keith Loria*

**26**

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## Driving Value

ON BEHALF OF THE CEBA EXECUTIVE COMMITTEE AND BOARD OF DIRECTORS, I'M HONORED TO UPDATE YOU ON OUR ORGANIZATION'S CONTINUED GROWTH AND INITIATIVES TO CONTRIBUTE EVEN MORE VALUE TO THE INDUSTRY.

I'm pleased to share the state of the CEBA organization is strong and continuing to grow.

The CEBA Board of Directors has undertaken transformative work over the last few years. As we came out of the pandemic, the CEBA Executive Committee collaborated closely with GCCA leadership to strengthen our governance with new bylaws; formalize an annual management agreement with dedicated staff resources; and bring a renewed focus on executing CEBA strategic priorities to drive enhanced value.

As a result, our organization's topline has doubled from pre-pandemic levels.

More importantly, CEBA is driving value in our industry like never before.

CEBA's strategic focus continues to be advancing CEBA member recognition in the areas of building talent, promoting value and developing expertise for the controlled environment building and design industry.

Supporting these strategic pillars, CEBA has been hard at work through its Education and Training Committee and tasks forces to develop CEBAPro, a North American-based industry training curriculum and recognition of proof of knowledge. The initial target audience of this training and testing program is general and thermal contractors. Stay tuned for CEBAPro's 2024 launch.

CEBA has active committees focused on Education and Training; Business Development and Marketing; Building Codes and is launching an International Committee this year. End users are welcome and encouraged to get engaged!

To further support our strategic focus on our workforce, CEBA is recognizing top female contributors and leadership talent in the controlled environment building industry and making strides in growing this important segment of our industry. I encourage you to read the article on page 16 in which members of the newly launched Women in CEBA describe how empowering it is to challenge the stereotype of construction as a male-dominated industry.

CEBA's popular Built by the Best Program is entering its eighth year with more submissions than ever. It's also becoming more global with entries from Africa and Europe this year. See the Built by the Best case study of 2022 finalist, Primus Builders, on page 22. Stay tuned for the announcement of this year's finalists at the upcoming CEBA Conference. And for those of you working on innovative projects in the 2024 cycle, we hope to see your submissions next year!

We've been hard at work building additional value into the CEBA Conference and Expo experience.

We've added education sessions, an interactive construction café session, contractor and supplier roundtables, Built by the Best finalist presentations and much more. The CEBA Expo brings the industry's hottest innovations and all things controlled environment building/design related.

We hope you can join us at the 43<sup>rd</sup> CEBA Conference and Expo at the Omni Rancho Mirage, Palm Springs, California, November 11-14.

It's been a personal and a professional honor to serve as your CEBA Chairman and to be part of the Alliance. On behalf of the CEBA Board of Directors, we are grateful for the powerfully productive and strategic partnership with the GCCA Board and membership! 🤝



MARKO DZELETOVICH  
CEBA CHAIRMAN

## COLDFACTS

COLD FACTS magazine is published every other month by the **Global Cold Chain Alliance (GCCA)**, an organization that unites partners to be innovative leaders in the temperature-controlled warehousing, transportation and logistics industry.



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# DEVELOPING THE GLOBAL COLD CHAIN

*GCCA Farm Bill Initiative introduced in the U.S. House and Senate.*

**By Lowell Randel**

The Global Cold Chain Alliance (GCCA) is actively pursuing the inclusion of language in the next Farm Bill that would support the development of the global cold chain.

The process began in early 2023 with exploring the potential policy options to promote the cold chain and the development of a concept paper for the creation of a new program at the United States Department of Agriculture (USDA) to build cold chain capacity in developing markets to boost trade.

Agricultural trade is a major contributor to the economy and supports numerous jobs across the food supply chain. According to USDA's Economic Research Service, the United States produced \$177.3 billion of agricultural exports in calendar year 2021, and those exports produced an additional \$190.5 billion in economic activity leading to a total economic output of \$367.8 billion.

As evidenced by recent disruptions, one of the biggest barriers to a strong and resilient global food supply chain is the lack of cold chain capacity in emerging markets. According to the U.S. International Trade

Administration, cold chain systems are crucial to the growth of global trade in perishable products and to the worldwide availability of food.

Each year, billions of tons of perishable food products and millions of dollars of U.S. exports are lost due to poor cold chain systems in developing markets. Increased investments in cold chain capacity will also help to decrease the more than 1 billion metric tons of global food waste created every year. Many of these losses result from a lack of proper facilities, improper food safety handling procedures and insufficient training for those personnel working in the cold chain.

In spring 2023, GCCA staff and GCCA Warehouse Chairman Mike McClendon met with staff from the House and Senate Agriculture Committees, Members of Congress and officials from USDA to discuss GCCA's initiative and opportunities to include it as part

of the 2023 Farm Bill. These efforts resulted in drafting legislation entitled the Fortifying Refrigeration Infrastructure and Developing Global Exports (FRIDGE) Act.

The FRIDGE Act would add a section promoting infrastructure in the Foreign Market Development (FMD) program and authorize \$1,000,000 annually to fund the initiative.

The FRIDGE Act, by prioritizing infrastructure, is intended to enhance and supplement the current MAP/FMD programs that have shown great benefits in promoting food and agriculture products, all of which are reliant on an efficient and effective supply chain. By establishing infrastructure for trade, the current trade programs within USDA would be strengthened by new and emerging markets that may have been inaccessible before.

Major benefits of the FRIDGE Act will include:

1. Increasing export market potential for perishable products
2. Reducing food loss and waste
3. Improving food security and nutrition in emerging markets

During the GCCA Policy Forum this past June, GCCA members visited Capitol Hill to



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build support for the FRIDGE Act. GCCA members and staff met with 30 House and Senate offices to brief them on the legislative proposal. Rep. Feenstra (R-IA) gave a keynote address during the Policy Forum and highlighted the importance of cold chain infrastructure to trade. During his speech, Rep. Feenstra shared his plans to introduce the FRIDGE Act for consideration as part of the next Farm Bill.

On July 13, Rep. Feenstra was joined by Representatives Tracey Mann (R-KS), Jim Costa (D-CA) and Salud Carbajal (D-CA) in introducing H.R. 4612, the Fortifying Refrigeration Infrastructure and Developing Global Exports (FRIDGE) Act. A companion bill was introduced in the Senate on July 27 led by Senators Mike Braun (R-IN) and John Fetterman (D-PA).

It is important to note that all of the original co-sponsors of the FRIDGE Act in both the House and Senate are members of the Agriculture Committee and represent bipartisan support for the bill. “The FRIDGE

would strengthen the ability of these markets to safely and efficiently receive high quality U.S. perishable commodities, creating new trade opportunities, improving food security and nutrition, and reducing waste due to food loss,” says GCCA Warehouse Chairman Mike McClendon. “GCCA strongly supports the FRIDGE Act and thanks Representatives Feenstra, Mann, Costa and Carbajal and Senators Braun and Fetterman for their leadership in introducing this important legislation.”

“GCCA greatly appreciates the vision of the FRIDGE Act sponsors in drafting this legislation,” says Matthew Ott, President and CEO, GCCA. “These efforts will expand export markets and will add to additional cold chain capacity while reducing food loss and waste globally.”

The overall goal is for the FRIDGE Act to be incorporated into the Farm Bill, which is currently being developed by the House and Senate Agriculture Committees. The committees have conducted numerous hearings over the last two years and are now beginning to

draft legislative language for the 2023 Farm Bill. The last Farm Bill, passed in 2018, expires on September 30, 2023.

Given the timing and complexity of putting together comprehensive food and agriculture legislation, there is an increasing likelihood that a short-term extension of current policies may be needed to afford the committees sufficient time to complete their work. GCCA will continue to work with FRIDGE Act sponsors and the agriculture committees throughout the Farm Bill process to communicate the importance of the FRIDGE Act to building global cold chain capacity, increasing trade and improving food security. 🌐

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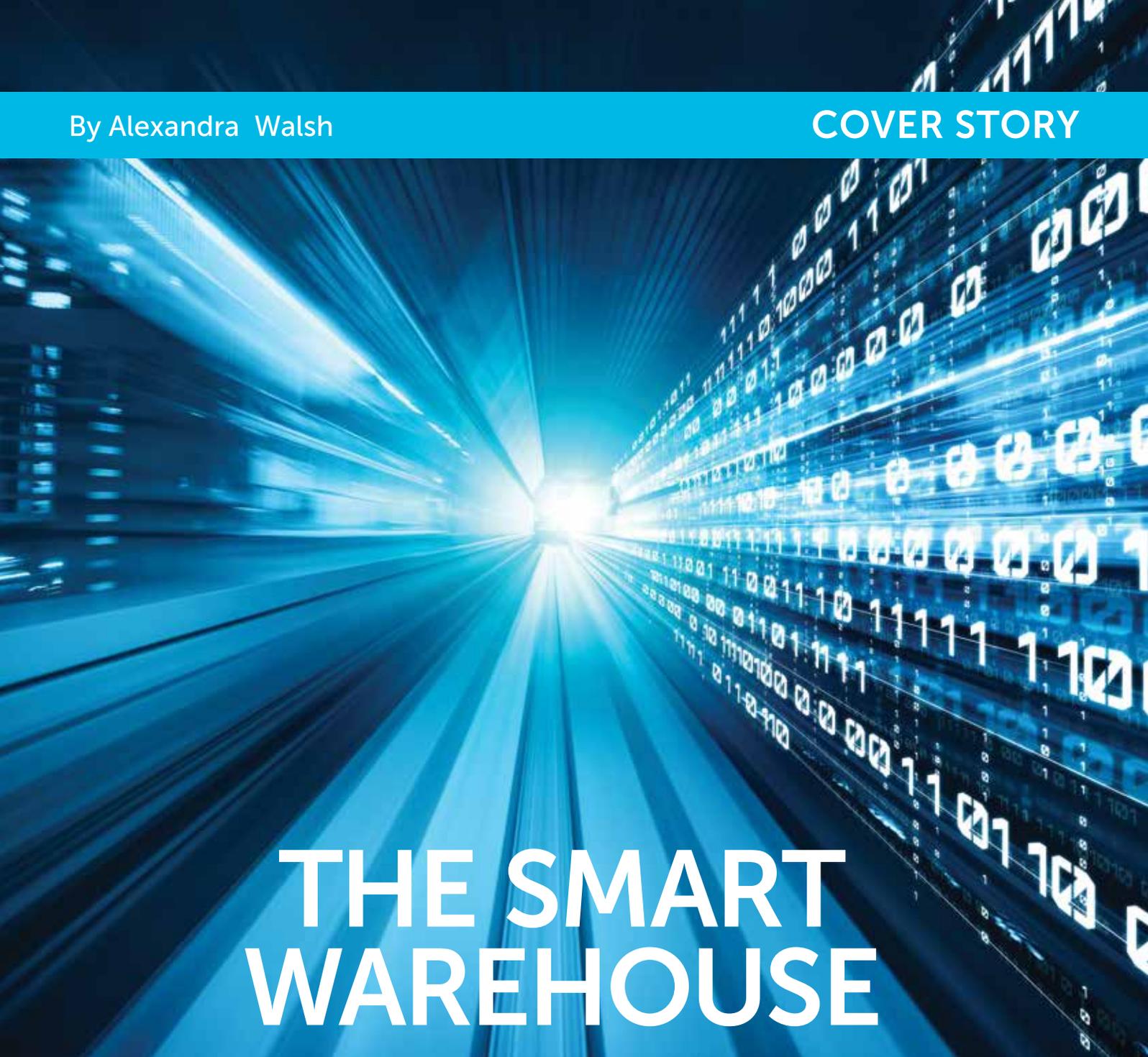
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# THE SMART WAREHOUSE

AI promises greater efficiencies and ROI in cold chain logistics.

**A**rtificial intelligence (AI) has the potential to transform many industries and businesses, and temperature-controlled warehouses are no exception. AI has been forging its way into the world of logistics and supply chain management, bringing with it a wide range of benefits that can help companies optimize their operations, increase efficiency, reduce costs and improve customer satisfaction.

## Labor Shortages and Worker Efficiencies

AI will impact labor shortages and worker efficiency and safety affirms Kaushik Sarda, Senior Director of Supply Chain Solutions, Americold.

“AI will help evolve on-floor operations in several ways, from helping with scheduling activities, such as labor planning/modeling tools, to increasing efficiencies in the building by allowing optimization of work (reducing travel times by predicting and directing work activities),” Sarda says. “Computer vision technology powered by machine learning will also increase safety.”

Bobby Kareer, Senior Director of Software Engineering at United States Cold Storage, believes software systems that offer directed task management have the potential to improve efficiency and reduce the labor requirements for the many operational processes in a warehouse.

“At the end of the day, it’s about having software systems that are designed to enable directed task management to satisfy key operational functions in an efficient and effective manner,” Kareer says. “These capabilities can range from your run-of-the-mill business process automation to more sophisticated systems that use historical data to suggest tasks to provide a net improvement in throughput while minimizing labor.”

Kareer says such capabilities can come from statistical models, optimization algorithms or machine learning techniques.

Catherine Lambert, Communication, Employer Branding & Government Affairs Strategist at Congepec, notes the type of AI they are using, and will be using, will not necessarily help with labor shortages but will impact worker efficiency.

“One example is in maintenance by providing more comprehensive data and analysis of temperature and energy efficiency. It will help us better identify areas that need to be made more energy efficient in our facilities,” Lambert says. “However, the use of AI

will require different qualifications in our employees with AI-related knowledge.”

## Inventory Management

AI can help warehouse operators improve inventory management through the use of advanced algorithms to predict future demand and optimize stocking levels, leading to more efficient inventory management and reducing the risk of stockouts and overstocking.

“As a 3PL, we are custodians of our customers’ products and are responsible for the safekeeping and effective shipping of their orders – this gives us some deep insights into some of the patterns of receipts and orders and available inventory,” Kareer says. “This information can help us provide our customer actionable insights and suggestions on how they may want to change their order shapes and inventory levels to reduce waste and improve operating costs during the receiving and shipping processes.”

Sarda says with predictive analysis and analyzing demand patterns along with finding correlation to exogenous factors (e.g., weather, geopolitics, economy), inventory management will be far more efficient than when it is manually managed.

“Using AI to simulate multiple strategy scenarios and their impact on inventory on hand will also help executives make better business decisions,” says Sarda. “At a tactical level, managing inventory inside of a warehouse should become easier as well with cycle count programs, dock cameras for identifying over, short and damaged (OS&D) etc. There should be significant reduction in inventory shrinkage because AI can help create better processes for auditing requirements and problem-solving.”

## Smarter Transportation

“At the end of the day, routing is a math problem so higher computing power will certainly help optimize routing capabilities,” Sarda says. “But the impact will be bigger in transportation overall rather than route

planning because AI can provide additional efficiency in predicting on-time arrivals, which will help warehouse operations better plan resources.”

Lambert points out AI could be used to optimize transportation and take into consideration shorter trips to closer locations thereby reducing greenhouse gas emissions.

“There are lots of opportunities to reduce shipping and transportation costs for our customers by analyzing orders for a given customer or by offering options for shared load delivery across multiple customers,” says Kareer. “Improved algorithms along with machine-learning techniques can be leveraged to suggest more sophisticated options on how to best satisfy their order fulfillment requirements in the most cost-effective manner.”

## Predictive Maintenance

Combining AI with IoT sensors will help analyze failure points on machinery in advance to prevent mechanical failures, says Sarda. He points out industrial manufacturers have been using AI for a while.

“Scheduling maintenance activities based on that intelligence will also allow you to manage labor shortages of maintenance experts,” Sarda points out. “And AI can help with inventory management of spare parts, directly impacting the bottom line.”

Lambert says AI helps to better manage a fleet of equipment used in their facilities in a much more effective and productive way. “Optimizing fleet management is key here as it helps to reduce maintenance on over-used equipment,” she says. “It can also help to identify areas of concern to improve energy efficiency leading to a more effective preventative maintenance of our buildings.”

## ROI and Accessibility

AI is improving warehouse operations overall by automating tasks, optimizing inventory management, reducing labor costs, improving delivery times and reducing equipment maintenance costs.

With the help of advanced algorithms and automation technologies, AI can analyze data, make predictions, and provide recommendations that help companies make informed decisions.

“If deployed properly with large training datasets and the right application, there’s a definite return on investment (ROI) in AI,” says Sarda. “From data mining to robotic process automation, AI’s payback in all things inside operations, as well as back-end activities, should be very attractive in years to come.”

Sarda adds, when AI is built into greenfield projects, chances of success will be higher.

Lambert points out publicly accessible AI is also definitely accessible to smaller companies.

Sarda agrees. “AI or machine learning gets a scary reputation, but at the end of day, it’s essentially training models that predict patterns based on good datasets,” he says. “Applications can be varied, and with cloud computing becoming a more accessible service, companies don’t have to invest huge amounts of money in infrastructure to get started.”

Sarda adds that with external consultant network availability, companies do not have to even invest in internal resources.

### Pressing Needs and Future Outcomes

Lambert believes today the most pressing need for AI in the warehouse is optimization of forklift movement in managing time and movement within the warehouse. And the next big thing – AI for production lines.

“This technology could allow us to better build our customer’s bill of material to prepare them better for production. In this way, we could offer an enhanced supply based on production needs and great just-in-time food production,” says Lambert. “It could even be managed remotely by knowing which ingredients are in inventory to provide the right material at the right time and better manage the production line as a result.”

In the future, Lambert believes the biggest impact of AI on supply chains will be the need to integrate AI in the work flow and to optimize transportation. “For instance, AI could be used to manage orders and plan transportation more closely, which could mean transportation to closer locations to reduce GHG emissions.”



Lambert adds that AI should be a top priority for human resource departments. She reports it is a tremendous tool that can be used specifically in HR departments to develop organizational structures in departments, job descriptions and the like. “But we have to remain vigilant and careful with the potential sharing of confidential information,” she warns. “We’ve already developed and implemented internal structures, policies and procedures to manage the use of publicly available AI such as Chat GPT.”

Lambert says surveillance by the company’s HR department is required, which has been accomplished internally within the company’s Code of Ethics and Business Conduct. “There is also a risk for a company’s confidential information with service providers, which has to be taken into account,” says Lambert. “However, an AI tool remains an advantage to build agility within a company.”

To Sarda, the most pressing need for AI is in enhancement of computer vision guiding systems such as OS&D prevention or productivity of automated guidance vehicles. And the next big thing in AI in temperature-controlled warehouses – driving ESG initiatives like carbon neutral warehouses.

“The biggest impact of AI on supply chains in the future is it will allow executives to model multiple scenarios to test strategies against real world challenges,” Sarda says. “It will help organizations in many ways – from

increasing forecast accuracy to inventory management, controlling costs in operations by increasing efficiencies to automating back-end functions.”

The supply chain is largely a set of independently managed links in the chain of custody from the farm to the table, Kareer suggests.

“Each link in the chain is trying to optimize its processes, independently leveraging the subset of data it has access to,” Kareer says. “If you look at this from an optimization theory perspective, it becomes evident that there are limitations to finding the best solution when we look to solve the problem in silos.”

Kareer notes AI is designed to reason over large data sets with myriad variables impacting effectiveness and efficiency outcomes. He believes if the industry was able to come together to share this data in order to understand the best way to get products moving most effectively through the cold chain, even greater benefits could be seen from AI.

By leveraging the power of AI, cold storage companies can stay ahead of the competition and provide better experiences for their customers. 🌀

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# A PROFESSIONAL NETWORK

*Cold storage industry architects and engineers benefit from new Women in CEBA program.*

**By Gina Veazey**

**E**mpowering. Barrier-breaking. These are some of the terms women in the controlled environment building industry use to describe the new “Women in CEBA” program from the Global Cold Chain Alliance (GCCA). Women in CEBA provides a support network for women in the male-dominated field. (CEBA (Cold Environment Building Association) is a cold chain partner of GCCA.)

“Being part of Women in CEBA is a naturally empowering experience to me, and I see it as an opportunity to challenge the stereotype of construction being a male-dominated industry,” says Almedina Hamzić Mušić, Assistant Design Manager at

CT-Technologies in Sarajevo, Bosnia and Herzegovina.

Kristin Westover, Technical Manager, Specialty Installations with GAF, echoes Mušić’s sentiment. “We are breaking barriers in the industry,” she comments. “It is great to

know that we have a group of smart, high-performing and high-achieving women, and we are all in this together. We can uplift each other and do great things within the industry.”

Mušić and Westover joined a third member of Women in CEBA, Kate Lyle of Ware Malcomb, to discuss their roles in the industry, their motivations to stay in the cold storage industry and the need for the Women in CEBA program.

## **Choosing Cold Storage**

The architects and engineers uniformly say the unique complexity of cold storage is most appealing.

A licensed architect, Lyle oversees the Ware Malcomb national practice focused on cold



*Almedina Hamzić Mušić, Assistant Design Manager at CT-Technologies, challenges stereotypes in the male-dominated construction industry. (Photo courtesy of Almedina Hamzić Mušić.)*

storage, food and beverage processing and food-grade buildings. She joined the firm after working on mostly speculative industrial buildings for about six years.

That was 2019. It was a good move, she says. “I found it fascinating! From an architectural standpoint, there’s so much complexity and detail. And I also really enjoyed learning about the food supply chain, and all the buildings that help move and process food from farm to table,” Lyle says.

“When I joined Ware Malcomb, I was looking for an opportunity to really grow my career, and they said that I would have room to grow,” Lyle recalls. “I’ve been very pleased to find that to be the case.” She started as senior project architect and has been promoted twice, to studio manager, industrial cold and food in 2020 and to her current role as director, industrial cold and food in 2021.

Taking a different path, Mušić says she “always had an interest in industrial architecture and practical solutions that have a significant impact on preserving perishable goods. The cold chain industry, with its critical role in this aspect, captured my attention.”

Mušić entered the cold storage industry in 2020, not long after completion of her master’s

degree in architecture and urban planning. She had previously worked in residential and commercial construction as well as in industrial heritage.

At CT-Technologies, Mušić says the greatest challenge has been ensuring successful project execution in demanding environments such as in Southeast Asia and Africa. “These regions present unique logistical and climatic complexities that require innovative solutions and great adaptability to meet tight schedules and achieve the seamless construction of cold storage facilities,” she says.

A professional engineer, Westover joined GAF in 2020 from a structural engineering consultancy where her work focused on existing buildings. She also performed third-party inspections for various building envelope systems in new construction projects. “Every building is different,” she observes. “I loved the technical aspect of understanding how building parts come together to make a high-performing building.”

At GAF, Westover specializes in cold storage roofing assemblies, bringing her past design experience into the manufacturing world and working with designers and consultants to optimize roofing assemblies.

“Cold storage buildings, while they are the same roof assemblies as ‘regular’ buildings, require special details to ensure that the roof functions properly, including keeping the inside cold,” Westover explains. “Working in the field of cold storage has allowed me to use my knowledge of high-performing buildings and technical detailing to translate into the best roofing assemblies for our cold storage customers.”

### **A Day in the Life**

All three of the Women in CEBA members say no two days are the same.

Westover consults with designers and contractors on ongoing cold storage roof projects, including on the constraints of projects in the design phase, to help them decide the best roof assembly for their project and to ensure the roof is energy efficient and airtight. “I consider each of our projects a team effort,” Westover explains. “Keeping open lines of communication and contact ensures that we are going to have the most high-performing roofing system for each cold storage facility.”

Westover also visits worksites to check on progress and help troubleshoot any problems. “That is the fun part of construction,” she says. “You can always anticipate something you didn’t anticipate.”

An expert on cold storage roofing, Westover often shares her knowledge in lunch-and-learn presentations for designers and contractors and travels to conferences to stay educated on topics within the building industry.

Like Westover, Mušić works closely with the design team, conducting design reviews, collaborating with architects and engineers, and ensuring that the design plans meet client requirements and industry standards. She participates in client meetings to address design-related queries and incorporates their feedback into the project.

“Throughout the day, I’m involved in project coordination, managing timelines and liaising with various stakeholders to ensure smooth project execution. Certainly, each day presents its own set of challenges and oppor-

tunities for growth, making my work both diverse and fulfilling,” Mušić says.

As the leader of a small team of specialists, Lyle explains, “My days vary a lot, but at the heart of it is sharing my knowledge about cold storage and industrial food design, both internally and with our clients and consultants.”

Some days that means meeting with clients about new projects and responding to RFPs, while other days, she interfaces with local Ware Malcomb offices to help with projects. She might develop training programs for her company colleagues on key components in cold storage design. Or she might help a project manager modify a detail to meet local code requirements. She also performs quality control reviews to ensure plans address all of the nuances of cold or food design.

### Gender Parity

On the need for the Women in CEBA program, the three women share their experiences in predominantly male professions.

Lyle, who recalls that half of the students in her architecture program were women, says she was surprised when the gender ratio was different in her first job. “I was the only woman. My engineering consultants were men, my contractors were men, the developers were men. It was so surprising to me,” Lyle says. “It has slowly gotten better. I work with many more women both at Ware Malcomb, and amongst our clients and consultants. But while I’m no longer the only woman, we’re still a long way from 50/50.”

Westover agrees. Although she says construction overall, including in the cold storage industry, is predominantly a male industry, she welcomes the increasing number of women. “I definitely have seen an increase in the number of women in the industry in the 15 years I have been working in it.”

Indeed, gender parity has improved some over time, but that progress has been very slow. Only 15% of engineering positions were held by women in 2020 across six Organization for Economic Cooperation and Development (OECD) countries – Australia, Brazil, Canada, India, United Kingdom and the

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“Diversity leads to better design. Every person in the design-build community brings a wealth of knowledge from our lives and experiences, and the greater the variety of those experiences, the better the buildings.”

*Kate Lyle, Ware Malcomb*

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United States. In contrast, 39% of all jobs were held by women in these countries, according to the World Economic Forum Global Gender Gap Report 2022.

“I am optimistic that these issues will continue to evolve positively in the coming years,” Mušić says. “In my experience as someone involved in the academic world, I have observed a notable increase in female representation across various engineering fields, which is an encouraging trend.”

“Diversity leads to better design,” says Lyle. “Every person in the design-build community brings a wealth of knowledge from our lives and experiences, and the greater the variety of those experiences, the better the buildings. I hope more women will join the industry, and stay in the industry and be valued for the diverse experiences they can bring to the table.”

### Looking to the Future

Although women occupy more science and technology roles today, including in the cold storage industry, there are signs that future progress will require a concerted effort.

Women remain significantly underrepresented in engineering, manufacturing and construction classrooms, affecting the future pipeline for women in these roles.

In the United States, almost half of students pursuing an architectural degree today are women, according to the American Institute

of Architects (AIA), yet only a small proportion ultimately become registered architects. Fewer than one in five (17%) registered architects are women in the United States, according to AIA.

“I think each sector of the industry has its own challenges, but on the architecture side I think the biggest problem is attrition,” Lyle explains. “Women are still graduating as architects, but they are leaving the industry for a wide variety of reasons, and so it’s a very complex problem to solve.”

**GINA VEAZEY** is a writer and editor based in Rehoboth Beach, Delaware, who specializes in food industry, business and health care topics.

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The Administration and Congress are considering a wide range of policies that could impact the cold chain in 2023. Key issues:



### FARM BILL

- Congress is working to reauthorize the Farm Bill in 2023.
- GCCA will be actively engaging with Congress to advance cold chain industry initiatives and priorities.



### CLIMATE CHANGE

- Pursuing aggressive policies to address climate change, through both executive action and legislation
- Implementation of the AIM Act to phase down HFCs



### TAXES

- Increasing the corporate tax rate, phasing out deductions for pass-through entities
- Raising the top marginal income-tax rate



### LABOR

- Strengthening worker organizing, collective bargaining and unions through executive action and legislation such as the PRO Act
- NLRB advancing labor initiatives, like 'micro-unit' organizations and joint employer policies



### BURDENSOME REGULATIONS

- Revising EPA's Risk Management Program (RMP) regulation and making additional requirements
- Changes to OSHA's Process Safety Management regulation
- Implementation of FDA's Food Traceability Rule

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# CEBA

## ***BUILT BY THE BEST*** **CASE STUDY**

By Keith Loria

### **Sharing the Chill**

*Primus Builders delivers first spec cold storage warehouse in Dallas.*

Cold Summit Development, a developer of cold storage facilities, strives to provide its tenants with maximum options from freezer temperatures to office space.

To capitalize on the white-hot cold storage market in Dallas, Texas, United States, Cold Summit Development selected Primus Builders to provide design-build services on a 344,000-square-foot greenfield cold storage facility.

“This project is one of the first speculative cold storage warehouses ever on the market,” says Erik Gunderson, a founding partner and Executive Vice President at Primus Builders. “That means instead of the owner being the end user, this facility would be shared by four tenants. Fortunately, Cold Summit Development is an expert in cold storage construction and issued a robust, comprehensive RFP package that included features appealing to tenants. For example, flexible freezer temperatures that allow tenants to pivot their inventories to consumer needs as well as customizable offices.”

Included in the project are convertible freezers (-20° to 55°), truck docks, office space and maintenance areas. As the facility is a multi-tenant complex with four individual tenant areas, each needed to be independent from the others. Tenant one would operate in two suites and the remaining three tenants would have a single suite each.

From the outset, Primus Builders recognized the competition would be challenging



*Primus Builders designed and built a 344,000-square-foot greenfield cold storage facility and one of the first speculative cold storage warehouses in the Dallas, Texas, market. (Photo courtesy of Primus Builders.)*

and focused on bringing the best subcontractor talent to the project.

“We knew Cold Summit was concerned with more than just the bottom line ... and while this is hugely important for commercial success, Cold Summit truly values partnership and took that approach to a level this industry rarely sees,” Gunderson says. “We also looked at more operationally efficient solutions and offered these as value-added propositions that helped set Primus apart. Our willingness to listen was a huge factor in our ability to secure the work.”

### **Getting Started**

Many years ago, the Associated General Contractors developed a concept referred to as “partnering.” This concept has been used throughout the industry and emphasizes the importance of bringing together all project stakeholders.

“Cold Summit Development is a true reflection of this partnering concept,” Gunderson says. “Their company mission statement is to ‘Love. Listen. Communicate.’ From the initial kick-off meeting, during monthly meetings,

and all the way to the close-out and post-occupancy work for tenants, this philosophy was widespread on the project, both in the field and in the office.”

The project kicked off in December 2020 and was completed in January 2022. Keeping to that timeline was something that Primus made an important focus.

“The Dallas landscape certainly has challenges,” Gunderson says. “Hot and cold weather extremes hit this job, as did an unseasonably wet winter and a dangerous ice storm. Through close coordination and deploying the Last Planner System in the field, Primus could make daily adjustments, helping all trade partners finish on time.”

The Dallas-Fort Worth (DFW) area is a key logistics hub with 40% of the U.S. population within 24 hours and more than 90% within 48 hours. The project is prime for businesses serving DFW directly, as it is 12 miles from downtown Dallas. It is also attractive to those focused on the broader regional/national market for its access to transportation and logistics infrastructure.

### **Innovative Design**

For Primus, Cold Summit Development represented a newer type of client in the cold storage industry – the real estate developer.

“Since they are not building operators, they are in the position of trying to predict the needs of their future tenants,” Gunderson says. “It led to a number of innovative designs for the Dallas project.”

That included a roof-top packaged refrigeration machine room.

“This is the first Primus project to feature a packaged refrigeration machine room installed on the lower roof,” Gunderson says. “This unique design feature serves multiple tenants from one central unit. Utility bills are separated based on refrigeration flows to individual tenants. The lower roof location means fewer maintenance requirements on the higher roof. This, coupled with full stair towers from the outside of the building to the condensing platform and refrigeration areas, makes for a safer building.”

Primus also installed the infrastructure for a building management system to allow future tenants to electronically manage systems such as lights, water and dock equipment, etc. This allows individual tenants to monitor utility and equipment usage to keep their spaces running at optimal efficiency.



*The project included a roof-top packaged refrigeration machine room, installed on the lower roof, which serves multiple tenants from one central unit but with separate utility bills. (Photo courtesy of Primus Builders.)*

“Perhaps the most interesting was the use of a low charge, fully convertible NH3 refrigeration system,” Gunderson says. “It provided refrigerant charges below regulatory thresholds that performed at the highest of standards and consumed less energy. Also, the packaged refrigeration machine room installed on the lower roof is a unique design feature that serves multiple tenants from one central unit. Utility bills are separated based on refrigeration flows to individual tenants.”

Additionally, Primus provided flexible floorplans to allow future tenants to subdivide freezer space. At the Dallas project, for example, one tenant wanted half of its freezer to be -20° and the other half to be -5°. Working around existing operations, Primus modified the space to accommodate this request.

### **Sewer Lines**

Future tenants are not limited to only cold storage customers. Primus installed additional sewer lines to allow Cold Summit to potentially attract food processors as well.

“As Primus continues to provide these tenant-specific updates, our team finds ways to deliver faster,” Gunderson says. “The first tenant update Primus completed took 10 weeks; the second took just five weeks.”

### **Sustainability Measures**

Cold Summit incorporated into the project energy efficient cooling and lighting systems that offer energy savings. However, because the Dallas facility is geared toward tenant

needs, Cold Summit did not incorporate substantial sustainable components in order to remain flexible.

“If a future tenant has sustainability goals, Primus will enlist the assistance of our in-house sustainability project manager to provide a plan to ensure those goals are achieved,” Gunderson says.

### **Overcoming Issues**

One of the most unusual challenges of the project was that the site spanned two municipalities – the City of Lancaster and the City of Dallas.

“Dallas was the primary permitter, but Lancaster had certain aesthetic standards we had to abide by that were often conflicting,” Gunderson said. “For example, the fencing selected by Cold Summit was allowed in Dallas, but not in Lancaster. So, in addition to obtaining permits in two municipalities, we had to modify the fence selection and other building components to meet the requirements of both municipalities.”

The other interesting challenge was the weather. In February 2021, Texas experienced the biggest ice storm in its history.

“We were forced to shut the project down while the region recovered,” Gunderson said. “This event also made it difficult to receive building materials. We relied on the strong relationships we have with our trade partners and using the Last Planner System to re-work the schedule and make sure we could complete the project on time.”

### A Job Well Done

As this project was one of the first speculative cold storage facilities in the cold storage market, flexibility, operational efficiency and robust building support systems and protection measures were deployed to help differentiate this build.

“We’ve been extremely proud of the continuous improvement we’ve demonstrated when customizing for building tenants,” Gunderson says. “This is a new concept for our team, and we keep getting better at it.”

Cold Summit was very pleased with the project. The company’s Vice President of Construction, Brad Blocker, says, “Cold Summit’s company motto is ‘Love. Listen. Communicate.’ Primus lived up to this sentiment. We look forward to future projects together.”

**KEITH LORIA** is an award-winning journalist who has been writing for major newspapers and magazines for close to 20 years, on topics as diverse as sports, business and technology.

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When the project shut down during the biggest ice storm in Texas history, Primus relied on its strong relationships with trade partners to complete the project on time. (Photo courtesy of Primus Builders.)



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The text 'BRING ON THE COLD' is rendered in a large, blue, 3D-style font with a white outline. The letters are set against a background of a warehouse aisle with blue metal shelving units. The word 'COLD' is significantly larger than 'BRING ON THE'.

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The text 'STOW ATLAS 2D' is written in a large, bold, white, uppercase sans-serif font. The '2D' has a registered trademark symbol (®) to its upper right. The text is positioned above a dark orange horizontal bar.

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# 43<sup>RD</sup> CEBA

## CONFERENCE & EXPO

### NOVEMBER 2023

*JOIN YOUR COLLEAGUES IN Palm Springs, CA  
November 11-14, 2023!*

The 43rd Annual CEBA Conference & Expo will be held November 11-14, 2023, at the Omni Rancho Las Palmas Resort in Palm Springs, California. This much anticipated event is the only one in the world dedicated to best practices in controlled environment facility construction, design and maintenance. In a year when cold chain is hotter than ever, this event is a must attend for anyone in the business.

With more than 350 controlled environment facility construction, logistics and supply chain operations professionals attending, participants will gain valuable insight for improving their business. Throughout the three-day conference, participants will hear presentations from industry thought leaders, have exceptional networking activities and experience an expo with cutting-edge products and technology.

#### **General Sessions**

The general sessions at the CEBA Conference & Expo provide attendees a thorough look at the latest innovations in controlled environment design and building.

This year's conference will include a keynote presentation from Jim Carroll, Futurist, Author & Innovation Expert. Carroll is recognized as the world's leading futurist, trends and innovation expert,



*Keynote speaker Jim Carroll*

with a massive global blue chip client list.

Carroll's insight has been covered in the *UK Telegraph*, Dubai's *Capital Magazine*, South Africa's *The Star*, and AP News, among hundreds more. *BusinessWeek* named Carroll as one of four leading sources for insight on innovation and creativity. He was also a featured expert on the prime time CNBC series, "The Business of Innovation."



### Education Sessions

This year the conference will feature a number of breakout sessions that will cover the following topics:

- Cold Storage Goes Green: Achieving LEED Certification on Controlled Environment Projects
- North American Industrial Real Estate Market Outlook
- Sustainability & Regulations: Implications for Controlled Environment Building Industry
- Speculative Cold Storage: Trends, Challenges and Opportunities
- and more!

### The Expo

The Expo is an experience not to miss, and features the latest technologies, solutions, products and services from some of the most respected and innovative names in the industry. Here's just a small sampling of the products and services that will be featured at this year's expo:

- Cold Storage Contractors
- Doors
- Energy Efficiency Solutions
- Fire Detection Systems
- Flexible Walls
- Flooring
- Insulated Panels
- Insulation
- Lighting
- Materials Handling
- Racking
- Refrigeration Solutions
- Roofing

### Built by the Best Award

The CEBA Built by the Best Award was created to acknowledge association members around the globe for their expertise and innovation in constructing, renovating and/or modernizing controlled environment buildings across the world. Conference attendees will hear from finalist companies during the General Sessions.

Buildings recognized with the Built by the Best Award seal represent some of the most innovative and complex facilities built around the globe according to the intricate, unique standards set forth by the controlled environment industry.

Going into its eighth year, in 2023 the award program includes two award categories. One award recognizes buildings constructed under \$35 million (USD) and one for projects over \$35 million (USD). The award recognizes the varying level of controlled environment buildings being constructed globally throughout the cold chain. Applicants are welcome to submit projects in each category.

This award is open to project teams in any country comprised of contractor/design-build companies and processor/end-user/warehouse/third-party logistics companies that meet the following criteria:

- Contractor or design-build company must be a CEBA member. Processor/end user/warehouse/third-party logistics company does not need to be a member.
- Building must maintain a controlled environment.

### 43rd Annual CEBA Conference & Expo Exhibitor List

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 Green Span Profiles  
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 Jamison Door Company  
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 Royalty Roofing  
 Rytec High Performance Doors  
 Senneca Holdings  
 The Raymond Corporation  
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 Twintec Kalman  
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*List current as of October 16, 2023.*

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*Notes: Airport cargo volumes based on preliminary 2022 estimates; employment, rail and truck freight comparing monthly totals as of May of each year; sea freight comparing quarterly totals for 1Q of each year.  
Sources: Marcus & Millichap Research Services; Department of Transportation; Federal Aviation Administration; Bureau of Transportation Statistics; Bureau of Labor Statistics; U.S. Census Bureau*

**Competition for industrial space is strongest across CRE spectrum.** At 4.0 percent, the vacancy rate in the U.S. industrial sector was at least 30 basis points below every other major commercial real estate segment in March. The pandemic's jolt to online consumer spending, as well as the shipping backlogs that occurred thereafter, structurally altered many businesses' risk management planning and led them to buttress industrial footprints. A resilient labor market is also propping up wages, buoying retail sales, and fueling needs for warehousing capacity.

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- Projects must be completed within the timeframe of January 1, 2022 - March 31, 2023.
- Submission must be received by the submission deadline. Late applications will not be accepted.
- Project must have been completed on or ahead of schedule.

### Construction Café

The CEBA Construction Café creates an exchange of ideas and discussion on critical issues facing the industry. Participants choose from different topics, join the table at which the issue is being discussed and spend time sharing ideas. Participants then switch tables to discuss other topics.

These roundtable conversations provide attendees a chance to share ideas, ask questions and solve problems with their peers in a small group setting. The moderator will guide the participants through questions they have submitted in advance, diving into the subjects that matter most to attendees and the industry.

### Networking Opportunities and Events

Prominent social activities, receptions and the exhibit hall all give members and industry suppliers unparalleled access to build partnerships with construction/design-build, warehousing and food processor decision-makers.

Other networking opportunities include a first timer and new member reception, an opening night reception, a rooftop networking reception, time, two afternoons set aside to catch up with peers and vendors for private business meetings, a golf tournament, a pickle ball tournament and a farewell brunch.

This is the only event in the world dedicated to best practices in controlled environment facility construction, design and maintenance, and serves to further CEBA's vision to be the association where anyone looking to build, renovate or modernize a first-rate, innovative facility comes to find the most experienced designers, contractors, manufacturers and suppliers.

Visit <https://www.gcca.org/events/CEBA-Conference> to learn more about the CEBA Conference & Expo. 📍

# 43<sup>RD</sup> CEBA

## CONFERENCE & EXPO

### NOVEMBER 11-14, 2023

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# COLD CHAIN DEVELOPMENT

## NEWS ABOUT GCCF INTERNATIONAL PROJECTS

This column features news about key projects of the Global Cold Chain Foundation (GCCF) and its work with members, aid organizations and international development partners to help emerging economies and lower-income countries meet the challenges that arise when growing a safe and efficient global cold chain.

### ACTIVE PROJECTS

#### **Bangladesh Trade Facilitation (BTF) Project, 2020 – 2025**

*Partnered with Venture37 and LixCap*

Since delivering virtual cold chain trainings and participating in the ASHRAE RAL Cold Chain Conference in May, the Global Cold Chain Foundation (GCCF) has increased engagement with cold chain stakeholders across Bangladesh. More than 30 individuals have downloaded the training, led by GCCA staff member Amanda Brondy and GCCA members Harshal Surange, Bob Tippman and Don Durm. GCCF is completing a cold chain feasibility study in the country at the request of a regional stakeholder that is interested in investing in the cold chain in Bangladesh and also planning a study tour to India for those interested in learning more about 3PL models.

#### **Cambodia Market Systems Program, 2022 – 2023**

*Partnered with LixCap and Khmer Cold Chain Company (KCCC)*

GCCF is advising on the construction and startup of the Khmer Cold Chain Company facility at the LM17 port on the Mekong River in Phnom Penh, Cambodia. GCCA Technical Experts Rusty Eason and Dick Dowdell are advising on the equipment installation, ensuring the facility makes use of an appropriate warehouse management system and assisting with preliminary startup operations.

#### **Dominican Republic TraSa Project, 2021 – 2025**

*Partnered with International Executive Service Corps (IESC)*

In July, eight project participants attended the Latin American Cold Chain Institute in Mexico City. For three participants, it was their first year attending the Institute; the remaining five were Year 2 students. GCCF Technical Expert Salvador Figueroa Sanchez



Matthew Meredith (LixCap, Ifria) leads a panel at the ASHRAE RAL Cold Chain Conference in Dhaka, Bangladesh.

completed an import mapping study for the project, which helps facilitate a better understanding of the existing cold chain infrastructure to support the importation of perishable products. GCCF continues to host webinars on new technologies and systems for traceability, energy management and precooling that may be of interest to Dominican cold chain operators.

#### **Southeast Asia Emerging Markets Program, 2019 – 2023**

GCCA staff Adam Thocher and Madison Jaco traveled to Cambodia, Thailand and Vietnam in August to meet with relevant cold chain and other logistics associations in each country. Following this trip, GCCF is developing a series of training and networking opportunities for the region. Trainings will include energy efficiency, warehouse operations and design-build and engineering.

#### **Egypt Rural Agribusiness Strengthening (ERAS) Project, 2019 – 2024**

*Partnered With Abt Associates Inc.*

Dr. Elhadi Yahia, a member of the GCCF Scientific Advisory Council, traveled to Egypt in June to provide training and technical assistance on best practices for postharvest handling of mangoes. He will return later in the year for a similar assignment on pomegranates.

#### **Reducing Food Loss and Waste**

GCCA's food maximization initiative and membership has picked up in Latin America. In Bolivia, Chile, Colombia, Mexico and Brazil, GCCA members are engaging their local food banks to provide feedback on design, equipment and best practices, as well as identify ways to work together in the future. Membership for foodbanks and other rescue organizations has increased to 41.

## COMPLETED PROJECTS

### Georgia Agriculture Project, 2018 – 2023

*Partnered With Cultivating New Frontiers in  
Agriculture*

Since 2018, GCCF has supported cold chain development in the Republic of Georgia through the U.S. Agency for International Development Agriculture Program. GCCF completed a cold chain assessment for the country in 2019. The foundation similarly supported investment seminars to promote cold chain investment in target areas. Most recently, GCCF has collaborated closely with the newly developed Georgia Cold Storage Logistics Association (GCSLA) and provided technical expertise on blueberries and other fresh fruits and vegetables. 🌱



*A company in the Republic of Georgia implements a creative inspection operation utilizing third-party warehouse space.*



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# COLD CHAIN FEDERATION CORNER

## NEWS FROM THE UNITED KINGDOM

In April 2022, the GCCA and the United Kingdom's Cold Chain Federation announced a partnership agreement signalling a renewed commitment to building knowledge, networking opportunities and insights across borders.

Here, Cold Chain Federation Chief Executive Shane Brennan continues his series for COLD FACTS exploring hot topics for our industry in the United Kingdom and beyond.



### Cold Chain at the Crossroads

Like our nation, the U.K. cold chain is at something of a crossroads right now.

Following five years of disruption during which the United Kingdom has exited the EU, navigated the impacts of the COVID-19 pandemic and battled to keep our heads above the fast-rising waters of inflation, a new phase is beginning.

We now have a clearer sense of the longer-lasting effects of the pandemic on the U.K. food supply chain, customer requirements and consumer behavior. We can also now make stronger – if still tentative – predictions about energy costs, which have largely stabilized, albeit at a very high level. But while these developments give U.K. cold chain operators a firmer footing for planning ahead, at the same time we face new uncertainties as our political parties turn towards campaigns for the general election we expect in 2024.

It is against this backdrop that operators are not only seeking operational efficiencies in the here and now but must also maintain momentum on the journey towards net zero in line with the U.K. government's target (enshrined in law) of a net zero economy by 2050.

At moments like this, it is particularly important for operators, and for the industry as a whole, to take stock of how the U.K. cold chain is changing. There is valuable information to be found in both hard cold chain data as well as in the perceptions and opinions of people working in and with our industry.

The Cold Chain Federation is proud to supply our members with the data and insights to enable them to do just that. Our new Cold Chain Report 2023 sets out the industry's latest key numbers as well as a detailed study of the current perceptions and opinions of the United Kingdom's cold chain professionals.



(Courtesy of the Cold Chain Federation.)

This study presents an overwhelming picture of positivity for the future among those working in and with the U.K. cold chain. Nine out of 10 respondents to our survey describe themselves as very positive or quite positive about the long-term future of the temperature-controlled logistics industry in the United Kingdom. The results of navigating the multiple crises of the past five years include a greater resilience. The growing demand for sustainable cold chain logistics is seen as a strong opportunity for the future, and the net zero agenda is perceived just as much as an opportunity as it is seen as a challenge.

But this positivity comes alongside full recognition of the challenges that operators are facing now and over the coming years, such as recruiting and upskilling cold chain workers and the scale of economic uncertainty in the United Kingdom. By far, the greatest challenge

identified by survey respondents is the cost of energy and other fuels.

Unsurprisingly, the subject of energy dominates the Cold Chain Report 2023. As well as high energy costs presenting the greatest challenge, energy tech is expected to have the greatest influence on the U.K. cold chain over the next 10 years. Our analysis shows an 89% increase in wholesale energy costs for the U.K. cold chain between 2017 and 2023. And operators are certainly responding, with 25% of U.K. cold storage sites now fitted with renewable energy technology.

Driven by customer requirements, the opportunity to save significant costs and increasingly stringent regulation, U.K. cold chain operators are making strong progress on energy efficiency. A number of fantastic examples of the pioneering use of developing technologies were recognized in our Cold Chain Sustainability Awards earlier this year.

The Cold Chain Federation is proud to support our members with practical guidance on current energy efficiency measures as well as insights into tomorrow's technologies and the new opportunities for cold chain operators as the United Kingdom transitions to a net zero economy.

Look for the Cold Chain Federation's "Cold Storage Energy Efficiency Practical Guide" and "Net Zero Cold Chain Project" reports at [www.coldchainfederation.org.uk](http://www.coldchainfederation.org.uk). 



(Courtesy of Cold Chain Federation.)



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# COOL SOLUTIONS

## SCIENTIFIC ANSWERS TO COLD CHAIN CHALLENGES

This section highlights a cold chain question and answer submitted through the GCCA Inquiry Service to the team of experts on the GCCF Scientific Advisory Council (SAC), the roster of SAC members and abstracts on cool solutions written by SAC members. Submit your cold chain questions to the Scientific Advisory Council at [www.gcca.org/inquiry](http://www.gcca.org/inquiry).

**Q:** I have colleagues that would like to lower the set temperature of temperature-controlled containers from -10°C or -18°C to -30°C in four-degree increments. Then, once stabilized at -30°C, they would like to turn the reefer container off and let the temperatures increase back to -10°C or -18°C. Once it is stabilized at the higher temperature (-10°C or -18°C), they want to turn the unit back on and decrease the temperatures, again in four-degree increments, down to -30°C. This process would be repeated two or three times over a couple of weeks.

Will this process have an impact on the quality of the cargo? We know all cargo does not have the same cellular structure, but what would be the impact of the planned changes in temperature on meat, poultry, cheese, pastry or bread and fruit or vegetables in frozen form?

**A:** This question can be addressed (quantitatively) with the Cost to Freeze/Time to Freeze calculator; it is the fourth component.

The short answer would be to avoid increasing the temperature above -18°C. The damage to product quality occurs as a result of the thawing and refreezing of ice during temperature fluctuations. These changes are minimized at temperatures below -18°C. In many products, the amount of unfrozen water at -10°C becomes significant, and re-freezing can cause significant damage.

Reefer containers are designed to maintain the pulp temperature of the frozen cargo and not to uniformly increase or decrease the pulp temperatures of the frozen cargo. Lowering the reefer container's set point temperature from -10°C or -18°C to -30°C in four-degree increments and/or increasing the temperature (with the reefer container turned off) to -10°C or -18°C is not recommended.

When the frozen cargo temperature is higher than the specified set point temperature, the refrigeration unit will cool down the surface layer of the cargo, sometimes within days, but the center of the stow will not reach the desired temperature for a considerable period of time.

More specifically, reefer containers will not uniformly reduce the pulp temperature of frozen cargo pulping from -10°C to -30°C or evenly increase the temperature back to -10°C. The exterior of the cargo will eventually reach -10°C or -30°C but it is unlikely the interior of the stow will reach the -10°C or -30°C for an extended time.

The temperature of frozen goods stuffed into a refrigerated container should not, in general, deviate by more than 3°C from the specified set point temperature.

Importantly, the methodology presented can potentially adversely impact on the quality of the frozen cargo. For example, it is possible to double the storage life by maintaining frozen fatty fish at -30°C (relative to -10°C) during transport. Moreover, some U.S. retailers will reject frozen cargo pulping greater than -10°C. Additionally, the European Union Directive 91/493 specifically requires that during transport, frozen fishery products must be kept at -18°C or less in all parts of the product.

*Answer provided by Dr. Dennis Heldman, Food Process Engineering Expert, The Ohio State University and Dr. Patrick Brecht, Refrigerated Transportation Expert, PEB Commodities. @*

The Global Cold Chain Foundation's Scientific Advisory Council provides cutting-edge research and advice to members of the Global Cold Chain Alliance and its Core Partners. Submit your burning cold chain questions to the Scientific Advisory Council at [www.gcca.org/inquiry](http://www.gcca.org/inquiry) or at [inquiry@gcca.org](mailto:inquiry@gcca.org)



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The Global Cold Chain Foundation (GCCF) Scientific Advisory Council is an eminent group of food scientists, logistics, and packaging experts from around the world. The council provides cutting-edge research and advice to members of the Global Cold Chain Alliance and its Core Sectors.



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University of Florida, Cool-  
Climate Fruit & Produce Expert



**Dr. Cody Gifford**

University of Wyoming, Meat  
Products Expert



**Dr. Patrick Brecht**

PEB Commodities, Refrigerated  
Transportation Expert



**Dr. Dennis Heldman**

The Ohio State University, Food  
Process Engineering Expert



**Dr. Paul Dawson**

Clemson University, Poultry  
Products Expert



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**Dr. Elhadi Yahia**

Universidad Autónoma de  
Querétaro, Mexico, Postharvest  
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Submit an inquiry to the Scientific Advisory Council  
at [www.gcca.org/inquiry](http://www.gcca.org/inquiry)**

# COOL SOLUTIONS: ABSTRACT

SCIENTIFIC ANSWERS TO COLD CHAIN CHALLENGES



**DR. ELHADIM M. YAHIA**  
Emeritus Professor,  
Autonomous University of Queretaro, Mexico  
Postharvest Technology Expert

Perishable foods (fruits and vegetables) are of great importance for human nutrition and health, as they provide hundreds of bioactive compounds (phytochemicals) known to prevent different illnesses including cardiovascular diseases and some types of cancer. These important foods and their bioactive compounds exert their beneficial health effects through different mechanisms such as by acting as antioxidants, among other mechanisms.

In my laboratory, we investigate the phytochemical components in different food commodities by extracting, separating and identifying them, by understanding their absorption and bioaccessibility in the human body and their effects on some illnesses. The following three references are examples of the research activities of my laboratory on the topic.

1. Yahia, E. M., J. Ornelas-Paz, J. K. Brecht, P. Garcia-Solis & M. Maldonada Celis. 2023. The contribution of mango fruit (*Mangifera indica*) to human nutrition and health. Arab. J. Chem. 16, 104860: 1-27. <https://doi.org/10.1016/j.arabjc.2023.104860>
2. Cervantes-Paz, B., E.M. Yahia & A. Nuñez-Vilchis. 2022. Identification and quantification of fatty acids and lipid-soluble phytochemicals using GC-MS, HPLC-MS, and FTIR and their association with quality parameters during avocado ripening. J.

- Food Sci. 88(1): 119-132. <https://doi.org/10.1111/1750-3841.16390>
3. Arango-Varela, S., I. Luzardo-Ocampo, C. Reyes-Dieck; E. M. Yahia & M. Maldonado-Celi. 2021. Antiproliferative

potential of Andean berry (*Vaccinium meridionale* Swartz) juice in combination with Aspirin in human SW480 colon adenocarcinoma cells. J. Food Biochem. 00:e13760: 1-16.

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However, significant amounts of these very important foods (up to 30% to 60% depending on the type of commodity, producing region, handling system, market, etc.) are lost and misused along the supply chain. In addition to reducing the availability of foods in a world with almost one billion people suffering some sort of hunger, these significant losses and waste result in the squandering of many different important resources such as land, water, energy, chemicals and labor, and create major environmental waste and contamination.

My research and my support to the global industry, including support to GCCA members, involve the development and/or improvement and proper application of effective postharvest techniques and practices to preserve quality (including the nutritional quality and bioactive contents) and safety of these foods, and prolong their postharvest and shelf life, such as different components and practices of the cold chain during precooling, transport and storage, modified and controlled atmosphere techniques for packaging, storage and marine transport, and several other treatments such as heat, among other techniques, thus reducing quantitative and qualitative food losses and waste and increasing availability of safe and healthy foods.

The following references are examples of the research and development issues on some food commodities that we work with in my laboratory.

1. Yahia, Elhadi M. (Ed). 2020. Food loss and waste prevention to achieve food security and sustainability. Burleigh Dodds Science Publishing, UK. 819 pages. <https://shop.bdspublishing.com/store/bds/detail/workgroup/3-190-83433>
2. Yahia, Elhadi M. (Ed). 2019. Postharvest technology of perishable horticultural commodities. Woodhead Publishing, Oxford, UK. <https://www.elsevier.com/books/postharvest-technology-of-perishable-horticultural-commodities/yahia/978-0-12-813276-0>

3. Yahia, E.M. 2023. Sustainable production and handling of avocado. Burleigh Dodds Science Publishing, UK. ISBN-13: 9781801467254

Further information on the activities of my laboratory and support for the global industry can be found at [www.elhadiyahia.net](http://www.elhadiyahia.net) 

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# MEMBER NEWS

## NEWS FROM MEMBERS OF GCCA CORE PARTNERS

**LINEAGE LOGISTICS** has partially closed a joint venture arrangement with Hanoi-based cold-storage warehouse operator SK Logistics. SK Logistics' two cold storage warehouses, totaling almost 400,000 square feet, offer storage, distribution, stamping, weighing, classification, packing, and picking services for regional customers.



**RAYMOND'S®** High Capacity Orderpicker received a gold award in the actuators, motors and drives category in *Plant Engineering's* 2023 Product of the Year program. This award recognizes new products that advance innovation in the manufacturing industry.



**RLS PARTNERS** is rebranding as **CORE X Partners**, which started as an affiliate of **RLS Logistics**. Over the past few months, CORE X Partners has built an expanded operating team under Ken Johnson, President and 30-year industry veteran.



**TIPPMANN GROUP AND COLD-LINK LOGISTICS** held a groundbreaking ceremony on a new 198,000-square-foot cold storage facility in Ellisville, Mississippi. The state-of-the-art food-grade warehouse will offer nearly 27,000 pallet positions of frozen and refrigerated storage space. The building will utilize QFR Zone® blast freezing technology, a highly efficient, energy saving way of quickly freezing palletized products, with 44 QFR Zones® in the freezer, and 1,056 pallet positions of blast

freezing capacity. Twenty-one dock doors will be used for loading and unloading trucks as they bring product into and out of the facility.



**UNITED STATES COLD STORAGE** plans to establish operations in northwest Indiana, and broke ground on its new, automated cold storage facility. The company will invest \$124 million to construct and equip a 13.58 million-cubic-foot public refrigerated warehouse with more than 43,400 pallet positions, including approximately 35,600 positions serviced by an automated storage and retrieval system and approximately 7,700 positions with integrated, cascade layer pick technology. United States Cold Storage plans to install a solar array that will provide 100% renewable energy to the warehouse. ☺



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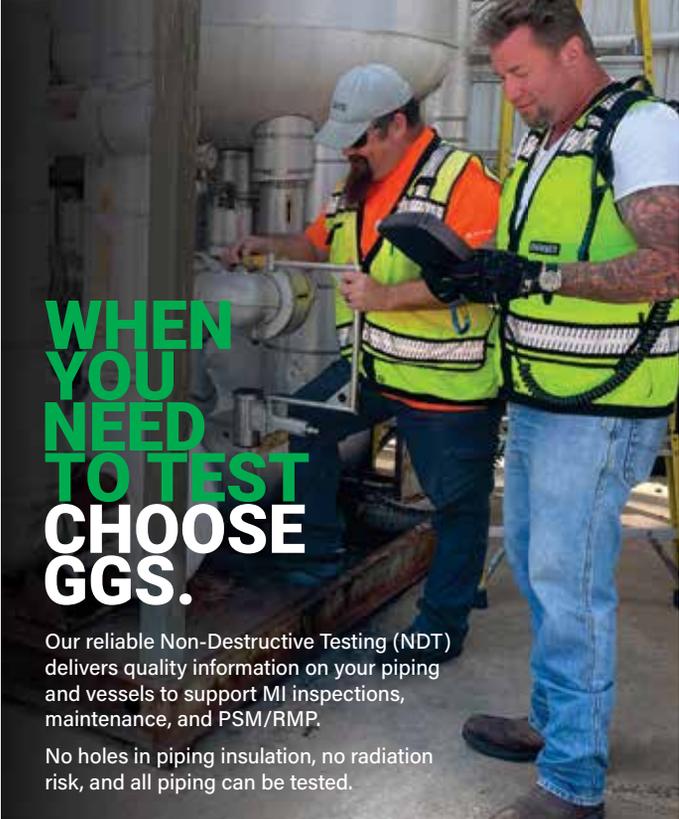


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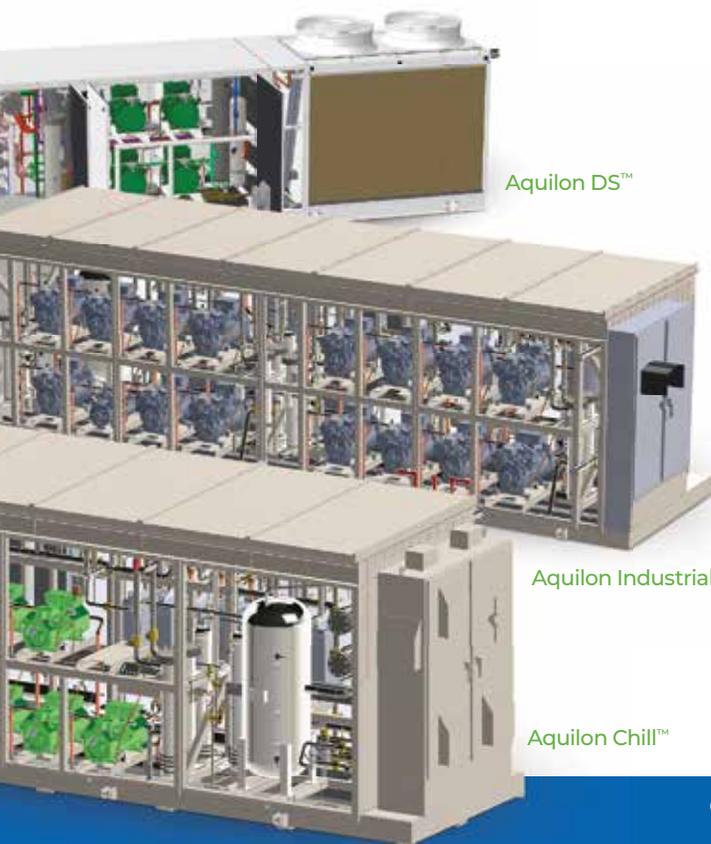
- Low charge ammonia packaged chillers from 40–400 tons at 5°F to 50°F outlet fluid
- Low charge ammonia condensing units from 30–160 tons at -20°F to 45°F SST
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# 2024 GCCA, GCCF and CEBA Global Events Calendar

FEBRUARY

## 59<sup>TH</sup> GCCF INSTITUTE EAST

4-6 FEBRUARY 2024

Atlanta, Georgia, United States | Georgia Tech Hotel & Conference Center

This event, designed for employees with clear management potential and executives new to the industry, features more than 40 classes in warehouse management and transportation management taught by leading experts in the industry.

**Audience:** Warehouse managers, operations managers, warehouse supervisors, shift leads, customer service managers, transportation managers, workers with high potential for management, and executives new to the industry.

## 59<sup>TH</sup> GCCF INSTITUTE WEST

27-29 FEBRUARY 2024

Tempe, Arizona, United States | Tempe Mission Palms Hotel at Arizona State University

This event, designed for employees with clear management potential and executives new to the industry, features more than 40 classes in warehouse management and transportation management taught by leading experts in the industry.

**Audience:** Warehouse managers, operations managers, warehouse supervisors, shift leads, customer service managers, transportation managers, workers with high potential for management, and executives new to the industry.



APRIL

## 27<sup>TH</sup> GCCA EUROPEAN COLD CHAIN CONFERENCE & EXPO

10-12 APRIL 2024

Brussels, Belgium | Brussels Marriott Hotel Grand Place

Here, delegates gain a better understanding of market trends, industry challenges, business solutions, and technological innovations. The conference also provides ample networking opportunities, enabling attendees to meet and connect with professionals from throughout Europe and around the world.

**Audience:** Executives and managers from temperature-controlled, third-party logistics companies.



MAY

## GCCF COLD CHAIN INSTITUTE AUSTRALIA

21-23 MAY 2024

Melbourne, Australia | Sheraton Melbourne Hotel

This event, designed for employees with clear management potential and executives new to the industry, features more than 40 classes in warehouse management and transportation management taught by leading experts in the industry.

**Audience:** Warehouse managers, operations managers, warehouse supervisors, shift leads, customer service managers, transportation managers, workers with high potential for management, and executives new to the industry.



JUNE

## GCCA BRAZILIAN COLD CHAIN CONGRESS

TBD JUNE 2024

Sao Paulo, Brazil | TBD

This educational event focuses exclusively on the temperature-controlled logistics industry and features opportunities and solutions for business development.

**Audience:** High-level executives in temperature-controlled warehousing or logistics.



## GCCA COLD CHAIN POLICY FORUM

TBD JUNE 2024

Washington, DC, United States | TBD

The GCCA Global Policy Forum offers education and interaction with government and agency officials in regards to the rules and regulations that impact the cold chain.

**Audience:** Executives with compliance and regulatory responsibility, members of safety and government affairs committees.



JULY

## GCCF COLD CHAIN INSTITUTE LATIN AMERICA

15-17 JULY 2024

Mexico City, Mexico | Hilton Mexico City Reforma

This event, designed for employees with clear management potential and executives new to the industry, features extensive classes in warehouse management and transportation management taught by leading experts in the industry.

**Audience:** Warehouse managers, operations managers, warehouse supervisors, shift leads, customer service managers, transportation managers, workers with high potential for management, and executives new to the industry.



AUGUST

## GCCF COLD CHAIN INSTITUTE BRAZIL

TBD AUGUST 2024

Sao Paulo, Brazil | TBD

This event, designed for employees with clear management potential and executives new to the industry, features extensive classes in warehouse management and transportation management taught by leading experts in the industry.

**Audience:** Warehouse managers, operations managers, warehouse supervisors, shift leads, customer service managers, transportation managers, workers with high potential for management, and executives new to the industry.



SEPTEMBER

## 133<sup>RD</sup> GCCA CONVENTION

23-26 SEPTEMBER 2024

Bonita Springs, Florida, United States | Hyatt Regency Coconut Point

This annual gathering for IARW and WFLO features education, networking and business development opportunities for third-party logistics companies and warehouse operators.

**Large Company Audience:** Owners, CEOs, presidents, executive leadership teams.

**Small to Medium Company Audience:** Owners, presidents, senior executives.



OCTOBER

## GCCF COLD CHAIN INSTITUTE EUROPE

TBD OCTOBER 2024

Amsterdam, The Netherlands | TBD

This event, designed for employees with clear management potential and executives new to the industry, features extensive classes in warehouse management and transportation management taught by leading experts in the industry.

**Audience:** Warehouse managers, operations managers, warehouse supervisors, shift leads, customer service managers, transportation managers, workers with high potential for management, and executives new to the industry.



NOVEMBER

## GCCA LATIN AMERICAN COLD CHAIN CONGRESS

7-8 NOVEMBER 2024

Panama City, Panama | TBD

This meeting enables GCCA members and leaders in the temperature controlled industry to interact, learn about industry trends and expand their knowledge. The Congress also serves as a discussion forum for issues of interest to multi-regional cold chain industry leaders.

**Audience:** Senior executives in temperature-controlled warehousing or logistics.

## 44<sup>TH</sup> CEBA CONFERENCE & EXPO

11-14 NOVEMBER 2024

Ponte Vedra Beach, Florida, United States | Sawgrass Marriott Golf Resort & Spa

This annual meeting of CEBA members offers education, business development opportunities and networking for company executives managing the building of new cold storage facilities and cold storage builders.

**Large Company Audience:** Chief engineers, regional facility managers, regional facility maintenance leads, construction engineer managers.

**Small to Medium Company Audience:** Owners/CEOs who are building or expanding facilities, chief engineers.



# ASSOCIATION NEWS

## NEWS ABOUT GCCA CORE PARTNERS

**GCCA** is pleased to announce that the recipient of the 2023 Latin America Future Leader Award is Gonzalo García, Head of Projects and Solutions at Emergent Cold Latin America, Peru. Garcia competed with Antonio Lacombe Sigrist, M&A Associate, IceStar, Chile and Juan Afanador, Director of Business Development, Emergent Cold Latin America, México. Applicants for the award were evaluated by a panel of industry leaders in the Latin America cold chain industry. The 2023 Judges included: José Carranza – Agroempaques, Peru, Dionisio Cos Malpica – Polart Port, México and José Luis Uribe – Red Polar, Colombia.

Megan Graaf, Supply Chain Solutions Architect from Vector Logistics was named

the 2023 GCCA African Future Leader Award recipient. This award was presented during the GCCA African Cold Chain Conference held in Cape Town, South Africa, August 2-4, 2023. The candidates delivered a short presentation during the conference where Graaf competed with Peter Juma Echulet, Operations Manager of BigCold. Ivan Sutic, Financial Director of Chilleweni Cold Storage Solutions; Owusu Akoto, CEO of FreezeLink; and Renier Du Preez, CEO of Digistics represented the panel of industry leaders that judged the Award Competition.

And lastly, the recipient of the 2023 Brazilian Future Award, announced in July after a virtual competition, is Bruno Nahas, Commercial and Operations Director at

Refrio Armazéns Gerais. Nahas competed for the award with Ricardo Nogueira Marinho de Avila, Project Manager, SuperFrio Logística Frigorificado. Judges for the Brazil competition included: Adilson Assunção, Operations General Manager at Emergent Cold LatAm; Danniele Moreira Leite, Partner at CAP Logistica; and Jose Humberto Cortes, Director at Brasfrigo

The GCCA Future Leader Award recognizes talented young professionals who have the potential to become cold chain leaders and make a positive contribution to the development of the global temperature-controlled warehousing and logistics industry.

The winner of the Latin America Future Leader Award will compete with other future

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# ASSOCIATION NEWS

NEWS ABOUT GCCA CORE PARTNERS

leaders from across the world in the 2023 Global NextGen competition. This award will be held in person at the GCCA Convention in Scottsdale, Arizona, September 24-27, 2023.



**CEBA** just announced Jim Carroll, recognized as a leading futurist, trends and innovation expert, will keynote the 43rd CEBA Conference & Expo being held November 11-14, 2023 in Las Palmas, California. Carroll will discuss the “megatrends” that are defining our future, the disruptive opportunities they present and the industry, skills, and business model opportunities they provide. Additional educational sessions include – Cold Storage Goes Green:

Achieving LEED Certification on Cold Storage Projects; Speculative Cold Storage: Trends, Challenges and Opportunities; Don't Kill your Golden Goose – Protect & Perpetuate Your Business; and Sustainability & Regulations: Implications for the Controlled Environment Building Industry. Registration is open on the website.



**GCCA.** What is the US Food and Agriculture Sector's Impact in Your Community? The 2023 Feeding the Economy report clearly demonstrates the resilience and strength of America's food and agriculture sector, showing increased economic output in every

state compared to the 2022 report. These industries are responsible for over \$8.6 trillion – or nearly 20% – of the country's economic activity, directly supporting nearly 23 million jobs (15% of U.S. employment). The Feeding the Economy food and agriculture sector economic impact study represents the contributions of a very broad combination of industries, including GCCA and 24 other food and agriculture associations. Read more at <https://feedingtheeconomy.com>

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##### **Ark Logistics**

Santo Domingo, Dominican Republic

##### **Chicken of the Sea Frozen**

El Segundo, California, United States

##### **Chlodnia Gdansk sp.z o.o.**

Gdańsk, Poland

##### **Coorporacion Integral de Mexico**

(Friodeli)

Leon, Guanajuato, Mexico

##### **Frío Comercial S.A.**

Panamá, Panama

#### GCCA ASSOCIATE MEMBERS

##### **A. P. Møller Capital**

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##### **AllFlat Concrete Profiling, Inc.**

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##### **American Western Steel LLC**

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##### **Aratum**

Hong Kong, Hong Kong

##### **Coastal Carriers LLC**

Troy, Missouri, United States

##### **Engineered Products**

Greenville, South Carolina, United States

##### **EverCase**

Elk Grove Village, Illinois, United States

##### **Fusheng Industrial**

St. Louis, Missouri, United States

##### **Global Roofing Group**

Phoenix, Arizona, United States

##### **J.P. Morgan Securities LLC**

New York, New York, United States

##### **Keep Supply**

Springfield, Missouri, United States

##### **Keith Manufacturing Company**

Madras, Oregon, United States

##### **Kelvin Group**

Wilmington, Massachusetts, United States

##### **Matheson Constructors**

Aurora, Ontario, Canada

##### **Medlog USA**

Mount Pleasant, Georgia, United States

##### **Mena Cold**

Jeddah, Saudi Arabia

##### **META Storage Solutions Inc.**

North Miami, Florida, United States

##### **Mitsui de Mexico**

Mexico City, Mexico

##### **National Cold Chain**

Concord, Ontario, Canada

##### **Nexus Refrigeration**

Norfolk, Virginia, United States

##### **NPV Solar**

Cheshire, Connecticut, United States

##### **Phoenix Door Systems**

Cincinnati, Ohio, United States



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| <b>REATA Commercial Realty, Inc.</b><br>Plano, Texas, United States        | <b>CHC-SA Concrete Floors (Pty) Ltd</b><br>Port Elizabeth, Eastern Cape,<br>South Africa | <b>Nexus Refrigeration</b><br>Norfolk, Virginia, United States           |
| <b>Slate River Systems, Inc.</b><br>Irving, Texas, United States           | <b>EverCase</b><br>Elk Grove Village, Illinois, United States                            | <b>Phoenix Door Systems</b><br>Cincinnati, Ohio, United States           |
| <b>Steel Worx Solutions LLC</b><br>Groveland, Florida, United States       | <b>Insulated Door Systems</b><br>Blackheath, Western Cape, South Africa                  | <b>R&amp;B Roofing</b><br>Rockwall, Texas, United States                 |
| <b>The Boston Consulting Group</b><br>Boston, Massachusetts, United States | <b>Keep Supply</b><br>Springfield, Missouri, United States                               | <b>Sewtreat Projects (Pty Ltd)</b><br>Witbank, South Africa              |
| <b>Thermo King</b><br>Bloomington, Minnesota, United States                | <b>Keith Manufacturing Company</b><br>Madras, Oregon, United States                      | <b>Single Ply Systems Inc.</b><br>Bloomington, Minnesota, United States  |
| <b>Voxel AI</b><br>San Francisco, California, United States                | <b>Matheson Constructors</b><br>Aurora, Ontario, Canada                                  | <b>Steel Worx Solutions LLC</b><br>Groveland, Florida, United States @   |



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PALM SPRINGS, CA



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Controlled Environment  
Building Association

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- **Keynote by Futurist, Trends, and Innovation Expert Jim Carroll**
- **North American Industrial Real Estate Update**
- **Insights into Sustainability and LEED Building and Design**
- **Perspectives on the Speculative Cold Chain Market**
- **Key Legal and Finance Protection Insights and Best Practices for Your Business**
- **Interactive CEBA Construction Café Table Discussions**
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Key innovations include robots five times lighter than our previous models, with over half of the components 3D printed.”

(Photo courtesy of David Hardiman-Evans.)

### DAVID HARDIMAN-EVANS

David Hardiman-Evans is Senior Vice President of Global Business Development for Ocado Solutions. He was part of this year’s Opening Plenary Session at the GCCA European Cold Chain Conference, where he talked about macroeconomic trends disrupting supply chains, Ocado’s approaches to today’s challenges and how they are relevant to anyone involved in the movement of perishable products.

### CF: What does the future of the cold supply chain look like?

**DH-E:** I think we will see grocery supply chains become more efficient as customer definitions of “convenience” become more sophisticated and more exacting. Accuracy in forecasting will play a big part. At Ocado, using artificial intelligence (AI) to improve forecasting generates a wide range of benefits both for efficiency as well as customer experience. In the United Kingdom, we make 20 million forecasts a day to understand real-time and predict how customers are shopping. This is core to cutting costs out of the upstream supply chain and enabling a super-fast inventory turnover. In turn, inventory costs are reduced and freshness improved while retaining market-leading accuracy and availability for the customer.

Put simply, technology investments will play a crucial role in improving the economics and sustainability of the cold supply chain.

### CF: In your highly automated supply chain, what are your suppliers doing to support you?

**DH-E:** Our top suppliers are highly tuned to the unique nature of our platform and customer fulfilment centers and are interested in the range of online opportunities opening that don’t exist in the same way offline. For example, our warehouse model cuts out the need for shelf-edge packaging providing opportunities to rethink packaging to be as efficient as possible.

The underlying feature is the availability of significantly more accurate and granular data. Suppliers have the opportunity to take advantage of webshop data by tailoring promotional strategies to target customer groups.

### CF: What are your most important supply chain metrics?

**DH-E:** An important overall component of success in online grocery is ensuring the end-to-end supply chain is fully integrated. Without the proper integrations and data visibility across the value supply chain, there are big risks of inefficiency.

Making online grocery profitable at scale can’t be solved by getting one or two things right. You need to look end to end through your profit and loss for efficiencies. That might be reducing the cost of your upstream supply chain, boosting labor productivity in fulfilment or reducing waste.

Getting the last mile right is also crucial – making delivery routing as efficient as possible and getting vans out on the road full every time. And of course, this all gets done without letting the customer down. No missing items, maximum shelf life, delivered on time.

You have to focus on every metric. That’s why it is such a complex challenge for many to solve!

### CF: What is Ocado Re:Imagined?

**DH-E:** In January 2022, we announced a raft of new technological breakthroughs called Ocado Re:Imagined. These capabilities collectively mean that our partners can shatter the trade-offs that have defined the industry so far: meeting the full range of customer missions faster and with lower operating costs; enabling shorter lead time deliveries for a larger proportion of sales; and driving faster speed to market.

Key innovations include robots five times lighter than our previous models, with over half of the components 3D printed. This enables us to achieve the same throughput as before but with considerably less energy thereby reducing our carbon footprint.

These technologies will be a critical enabler for a new generation of fulfilment centers – including micro sites – that do not require consumers sacrifice choice and good value in exchange for speed of delivery. ☞

## AD INDEX

All Weather Insulated Panels . . . . .	37
Avaska . . . <b>Front Cover Wrap</b> , 11, 54	
Bonar Engineering & Construction Company . . . . .	49
BRUCHA Corp . . . . .	7
Colmac Coil Manufacturing Inc . . . . .	51
Evapco, Inc . . . . .	15
Fisher Construction Group . . . . .	41
GAF . . . . .	19
Gamma Graphics Services . . . . .	42
Jamison Door Company . . . <b>Cover 3</b>	
Kalman Floor Company . . . <b>Cover 4</b>	
Kingspan Insulated Panels . . . . .	31
M&M Carnot . . . . .	43
Mac Rak Inc . . . . .	9
Marcus & Millichap . . . . .	28, 28
Mole Master Corporation . . . . .	40
Polyguard Products . . . . . <b>Cover 2</b>	
Primus Builders, Inc . . . . .	54
Rytec High Performance Doors . . . . .	35
Schaefer Systems International . . . . .	46
Stow US Inc . . . . .	25
The Kaiser-Martin Group . . . . .	42
Tippmann Engineering . . . . .	21
Tippmann Group . . . . .	33
TrueCore Panels . . . . .	3
United Insulated Structures Corp. (UISC, LLC) . . . . .	47
Vapor Armour . . . . .	5

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