COLDFACTS

OFFICIAL MAGAZINE OF THE NEW ZEALAND COLD STORAGE ASSOCIATION

APRIL 2025 | ISSUE 2

NZ IN 2050
WHAT WILL DRIVE FUTURE GROWTH?

PEEK INSIDE
FULLY AUTOMATED 3PL WAREHOUSE

OFF-GRID COLD STORE
Is it viable?

NEWS BITES | GOVERNMENT + SECTOR UPDATES | NEW MEMBERS

CONNECT TO THE COLD CHAIN

JOIN NZCSA TODAY!

MEMBERSHIP BENEFITS

Keep in touch with industry updates

Collective representation on policy and regulations

Discounts on conference attendance

Your business listed on our website

Promotional opportunities

ASSOCIATE MEMBERSHIP

For companies who service the cool and cold storage industry

FULL MEMBERSHIP

For companies who provide storage, handling, or transport of chilled or frozen products

SUPPORT NZCSA SO WE CAN SUPPORT YOU!

Join us! Visit coldstoragenz.org.nz/member-benefits

Questions? Contact Kim at kim@coldstoragenz.org.nz

EXECUTIVE OFFICER NZCSA
Kim Mundell
kim@coldstoragenz.org.nz
kim@mandeville.co.nz

FINANCE MANAGER NZCSA
Gloria Holliday
accounts@coldstoragenz.org.nz

PROJECT MANAGER
Brittany Owens
brittany@mandeville.co.nz

New Zealand Cold Storage Association Incorporated
PO Box 147, Kaiwaka 0542, New Zealand

ISSN 3021-3908

COLD FACTS is published by Mandeville Limited for the NZCSA. It is produced six times a year in digital format. The magazine is free. To subscribe to COLD FACTS, email info@coldstoragenz.org.nz

COLD FACTS keeps the cold storage industry up-to-date with sector news, policy and innovation. The magazine is a forum for sector discussion and we accept guest editorial, so the views contained in COLD FACTS do not necessarily represent the views of the NZCSA or its executive committee.

© New Zealand Cold Storage Association

IN THIS ISSUE

TIM MCDOWALL

Treasurer and Executive Commitee Member, NZCSA
Director of Operations NZ, Americold

YOUR EXECUTIVE COMMITTEE MEMBERS

Bruce Mulligan
North Port Coolstores
Past President

Brent Cawthray
Manawatu Cold Storage
Vice President

Tim McDowall
Americold
Treasurer

Donald Horton
Provincial Coldstores
Committee Member

Jeremy Putaranui
Anzco Foods
Committee Member

Mark Exton
Coolpak Coolstores
Committee Member

Mark Stevens
Lineage Logistics
Committee Member

WHAT IS YOUR BACKGROUND IN THE SECTOR?

I've been in the warehousing and logistics industry for nearly 25 years, working across diverse sectors including the retail, 3PL and 4PL businesses, and owned inventory warehousing environments. It's been quite a ride, with each experience offering unique challenges and opportunities to grow.

I started in cold storage in 2009 as DC manager for Versacold, prior to its acquisition by Americold. I spent two years in the role, then time in other sectors, before rejoining Americold in 2023. It was exciting to return to the industry. I love the challenges it presents.

WHAT DO YOU LIKE ABOUT YOUR ROLE AND OUR INDUSTRY?

The dynamic nature of the field. I like the constant evolution, the challenges, and the opportunities to make a tangible impact. At Americold, I work with functional teams spread across six locations in New Zealand.

It's incredibly fulfilling to be part of a sector that plays such a vital role in ensuring food reaches our local communities and global markets, supporting the economy and growth of business in New Zealand, while also being an integral part of the community we operate in.

Whether it is through provision of employment opportunities, personal growth of individuals, or supporting our community though our Giving Back initiatives, with a huge focus on being socially and environmentally responsible, thanks to the exceptional food industry and businesses we have here in New Zealand."

WHAT'S AN IMPORTANT ISSUE FOR OUR INDUSTRY?

Improving energy efficiency and sustainability in cold storage operations. Refrigeration and climate control systems consume significant amounts of energy, and with increasing environmental concerns, finding ways to reduce our carbon footprint is essential. This involves adopting greener technologies, optimising warehouse design for energy efficiency, and exploring renewable energy sources.

Balancing sustainability with cost efficiency remains a challenge, but it's one we must tackle to ensure the long-term viability and environmental responsibility of the industry. I'm proud to say that at Americold, I have the privilege of being part of the team that is steering sustainable facility design. Our New Zealand facilities are leading the way within Americold, achieving significant kilowatt-hour savings, high emission reductions, rainwater harvesting and solar energy generation.

WHAT DO YOU FIND REWARDING ABOUT BEING AN ASSOCIATION MEMBER?

Being a member of the NZ Cold Storage Association is incredibly rewarding because it provides a platform to connect with like-minded professionals who share a commitment to excellence in our industry. Collaboration and knowledge-sharing within the association is invaluable, as it helps to drive innovation and enables us to tackle common challenges together.

Being part of an organisation that advocates for and strengthens the cold storage sector in New Zealand is deeply fulfilling. It is empowering to contribute to the growth and sustainability of an industry that plays such a vital role in supporting our food supply chain and economy.

KIM MUNDELL

Executive Officer, NZCSA
Managing Director, Mandeville

Email me

Phone me 021 655 917

Book an online meeting with me

Connect with me on LinkedIn

Mandeville Limited specialises in association management and event solutions. Our team of association experts support a variety of associations based in New Zealand and Australia.

mandeville.co.nz

In this issue of Cold Facts, we spotlight the latest innovations in the sector—from off-grid opportunities and a glimpse into New Zealand's future, to an inside look at Australasia's first fully automated 3PL warehouse.

CONFERENCE – CALL FOR SPEAKERS

This year's theme, "Embracing AI and New Technologies: What is the Future of Cold Storage?", promises dynamic discussion. If you're passionate about innovation and experienced in the practical use of technology, we invite you to apply to speak at the 2025 NZ Cold Storage Association Conference in Napier this August. Share your insights or case studies and help shape the future of cold storage in New Zealand.

Opportunities are available to join an interactive panel or secure your own presentation slot. Spaces are limited—submit your topic idea today. The form is simple and takes just three minutes to complete.

Read more here

CONFERENCE – BOOK YOUR HOTEL

Our official conference hotel is the Scenic Hotel Te Pania, located directly across the road from the venue. To access the delegate discount, use the booking form on our conference website.

SHOWCASE YOUR COMPANY IN COLD FACTS

Our magazine format offers fresh opportunities for members to highlight their services and innovations. Full members get free press releases, and associate members get discounted rates for advertising and editorial options. If you'd like to be featured in an upcoming issue, please email brittany@mandeville.co.nz.

WE WANT TO HEAR FROM YOU

We always welcome feedback. If you have suggestions on how we can further support our members feel free to contact me anytime.

Thank you for your continued support of your association.

NEWSBITES

NEW ZEALAND AUTHORITIES SEIZE $1 MILLION WORTH OF ILLEGAL HFCS

A joint operation involving the New Zealand Police, New Zealand Customs Service, and the Environmental Protection Authority (EPA) has led to the seizure of over $1 million worth of hydrofluorocarbon (HFC) gases. These synthetic greenhouse gases, despite being released in small quantities, can have a global warming potential up to 14,800 times that of carbon dioxide.

The EPA is targeting illegal imports of HFCs sold without permits or levies, which help reduce their environmental impact. "Illegal imports undermine legitimate businesses and may involve contaminated HFCs that damage equipment," said Gayle Holmes, the EPA's compliance manager.

HFCs are regulated under the Ozone Layer Protection and Climate Change Response Acts. Since 2020, New Zealand has been phasing out HFCs to prevent 0.5°C of global warming by 2100. The investigation has resulted in the seizure of three tonnes of HFCs.

Violations can lead to fines or up to five years in prison. The EPA encourages reports of suspicious HFC offers at investigations@epa.govt.nz. Bulk HFC imports require a permit and registration in the Emissions Trading Scheme, but HFCs in products like air conditioners are exempt from permits.

Source: refindustry.com | Read more

MANUFACTURING GROWTH

New Zealand's manufacturing sector displayed its highest value for expansion since August 2022, according to the latest BNZ BusinessNZ Performance of Manufacturing Index (PMI) survey. The PMI is a monthly survey providing an early indicator of levels of activity in the New Zealand manufacturing sector.

The seasonally adjusted PMI for February was 53.9 (a PMI reading above 50.0 indicates that manufacturing is generally expanding; below 50.0 that it is declining). This was up from 51.7 in January and the highest level of expansion since August 2022. The February result is also above the average of 52.5 for the survey since the survey began.

Despite the lift in expansion, the proportion of negative comments from respondents stood at 59.5% in February, compared with 57.7% in January. It was also up from 59% in December and 56% in November. Negative comments during February focused on an ongoing issue around a lack of orders for some manufacturers, as well as sluggish sales.

BNZ's Senior Economist Doug Steel said that "the sustained improvement is a welcome change. It is one of several indicators that suggests the broader economy is turning for the better. Indeed, it indicates the pickup may be a bit faster than we are currently forecasting".

Source: businessnz.org.nz

NEW REFRIGERANT HANDLING CODES OF PRACTICE INTRODUCED IN AUSTRALIA AND NEW ZEALAND

The refrigeration and air conditioning industry in Australia and New Zealand has updated its standards with the release of the 2025 editions of the Refrigerant Handling Codes of Practice. Replacing the 2007 versions, these updates reflect advancements in regulations, safety, refrigerant technologies, and industry practices. Compliance is mandatory for professionals with a refrigerant handling licence or trading authorisation through the Australian Refrigeration Council (ARC).

The updated codes provide guidelines covering the entire lifecycle of refrigeration and air conditioning systems, from design and installation to servicing and refrigerant recovery. They include new regulatory requirements, technical advancements, and insights from extensive industry consultation. The codes are divided into two parts: Part 1 focuses on self-contained low-charge systems, while Part 2 covers all other stationary and transport refrigeration systems. Automotive air conditioning systems are governed by a separate code.

The revised codes are freely accessible on the ARCtick website and are essential resources for technicians. Apprentices receive copies during training, while experienced professionals are encouraged to review them to align their practices with current safety and environmental standards. Developed with input from industry stakeholders and government bodies, the 2025 codes reinforce best practices, reduce refrigerant emissions, and promote environmental sustainability.

Source: refindustry.com | Read more

DO YOU HAVE NEWS?

Tell us what is happening in your corner of the sector and we will publish it in Cold Facts.

Email kim@coldstoragenz.org.nz

SPONSORED | FREE REFRIGERANT UPGRADES WITH REFDESTRUCT

RefDestruct's Free Refrigerant Upgrade program is available to NZCSA members still using R404a and R507 in their cooling systems.

In the last few years R404a has become extremely expensive due to its high global warming potential and will be increasingly hard to get as supplies are squeezed by the Montreal Protocol phase out of HFCs.

Modern low GWP solutions like R449a can be used in most R404a systems without significant changes – saving on maintenance costs and power use. The change also reduces the environmental harm from leaks by 67%.

RefDestruct's exchange program supplies the new refrigerant for free in exchange for the old R404a in the system. This can save upwards of $50,000 in upgrading larger cool rooms.

The used refrigerant is safely destroyed to make sure it never re-enters the supply chain.

Call James Heckler on 027 341 0848 or email james@refdestruct.co.nz to find out more.

Source: RefDestruct.co.nz

DIRECTORY LISTING CHANGES

Have you checked your directory listing recently?

View the listings for Cold Stores and for Services. Please email any changes to kim@coldstoragenz.org.nz

NZ COLD STORAGE CONFERENCE 25
24–26 AUGUST 2025 | NAPIER
GO TO EVENT WEBSITE
read more
NEW ZEALAND COLD STORAGE ASSN INC

NEWSBITES

ACFS PORT LOGISTICS EXPANDS IN NEW ZEALAND

ACFS Port Logistics NZ will be acquiring the Coda Group business assets including the divisions of Auckland 3PL Transport (FCL & LCL), Auckland Freight Station (FAK) and the Rolleston DC in Christchurch.

The transition is set to be completed by 1 May 2025, at which point the business will operate under the new brand, ACFS Port Logistics.

This acquisition does not impact Coda Group's 4PL operations or its Bay of Plenty and Savill Drive locations.

"We are thrilled to welcome Coda Group's talented team into the expanding ACFS family. Coda's capabilities, service offerings, and strong reputation align seamlessly with our existing operations in Australia," says Arthur Tzaneros, CEO and managing director of ACFS Port Logistics.

"Together, we will enhance our value proposition for customers across New Zealand and aggressively expand our footprint as a key player in the containerised logistics market."

The acquisition of Coda's business assets will immediately position ACFS as a major provider of containerised logistics services, offering a multi-modal solution with strategically located FCL storage facilities at Metro Port in Auckland and Rolleston in Christchurch.

Since ACFS' entry into the New Zealand market in 2023, the company has been actively pursuing acquisitions to align its offerings with its Australian operations.

"The expertise and assets gained from this acquisition will help us fulfil our vision from the Covid era — to provide our New Zealand clients with the same high-quality service they receive in Australia," said Terry Tzaneros, Chairman of ACFS Port Logistics.

"I am excited about this acquisition and look forward to welcoming the Coda team into the ACFS Port Logistics family as we continue to grow."

Source: mhdsupplychain.com.au | Read more

AUSTRALIAN COLD CHAIN

The RWTA 83rd Conference and Exhibition is being held at the beach side Langham Gold Coast on Sunday 10 August to Tuesday 12 August.

This year's theme is "Advancing Cold Chain Resilience: Strategic Innovations & Sustainable Growth".

Speakers will explore the latest advancements and strategies shaping the future of the cold chain industry, with innovative approaches to sustainable growth.

rwta.com.au

BIRD FLU (PHEW)

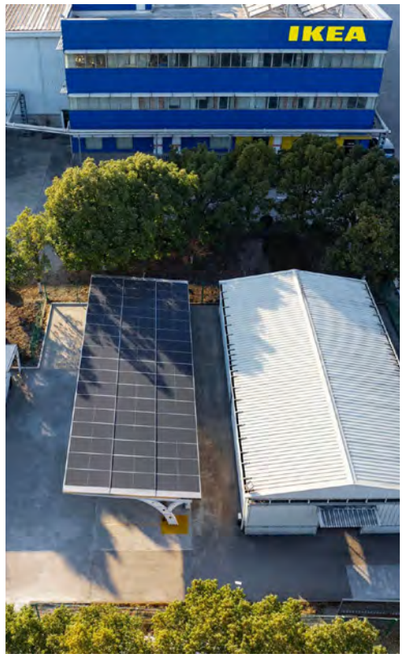
As of 23 March 2025, there have been no new reported cases of avian influenza in New Zealand since the initial detection of the H7N6 strain in December 2024. This outbreak was confined to a single free-range egg farm in Otago, South Island, and was effectively contained through stringent biosecurity measures, including the culling of affected poultry and movement restrictions.

Source: Reuters | Read more

ORIENTAL FRUIT FLY

In March 2024, a single male Oriental fruit fly (Bactrocera dorsalis) was detected in Birkdale, Auckland, during routine surveillance. The Oriental fruit fly is a serious horticultural pest that can severely damage fruit and vegetable crops. In response, MPI launched an intensive biosecurity operation, including the deployment of lure traps, public awareness campaigns, and restrictions on the movement of fruit and vegetables in the controlled area to prevent potential spread. While only one fly was found and no breeding population has been detected, precautionary measures remain in place. MPI has set up a Controlled Area Notice (CAN), meaning certain fresh produce cannot be moved from the area unless cooked or treated.

Source: Ministry for Primary Industries (MPI) | Read more



SPONSORED | IDEAL SOLAR INNOVATIONS FOR THE COLD CHAIN INDUSTRY

Golden Solar BIPV Solutions introduces two advanced solar products that are highly suitable for cold chain facilities.

The Galaxy Lightweight Panels are designed for metal roofs and membrane roofs, featuring a non-invasive installation without the need for perforations. This allows seamless integration with existing structures while delivering high-efficiency solar power.

The Industrial Solar Carports transform unused open spaces, such as parking lots, into energy-generating assets on-site, optimising land use and reducing electricity costs.

Both solutions help businesses lower energy expenses, improve sustainability, and transition toward greener operations. With Golden Solar BIPV, companies can achieve long-term energy savings and a reduced carbon footprint while ensuring a reliable power supply.

Source: goldensolarbipv.co.nz

NEW ZEALAND COLD STORAGE ASSN INC

WELCOME
to NZCSA newest Members!

FULL MEMBERS

GVI Logistics

ASSOCIATE MEMBERS

AceDoors System
BDC Group
CoSell
Dimond Roofing (Fletcher Steel)
EnerSys
Wagner Fire Safety

Not a member yet?
Read more

RWTA 83rd 2025 National Conference & Exhibition

The Langham, Gold Coast, QLD
Sun 10th - Tues 12th August

NEW ZEALAND COLD STORAGE ASSN INC

Follow NZCSA on LinkedIn
We post news and updates.

CONNECT WITH US TODAY!

NZ COLD STORAGE CONFERENCE 25

24–26 AUGUST 2025 | NAPIER

Embracing AI and new technologies:
What is the future of cold storage?

CALL FOR SPEAKERS

Are you using AI within your business?

Have you recently implemented new technology?

APPLY NOW TO BE A SPEAKER

americold

GLOBAL LEADER IN TEMPERATURE-CONTROLLED SOLUTIONS EXPANDS

Americold breaks ground in Christchurch, doubling site capacity to support FMCG, retail, and QSR business growth.

Americold, a global leader in temperature-controlled storage, logistics and facilities solutions, and value-added services, recently announced the ground breaking of its USD$34 million Halwyn facility expansion in Hornby, Christchurch.

This ambitious project will more than double the site's capacity, significantly enhancing its ability to meet the growing demand for temperature-controlled storage solutions across the South Island of New Zealand.

This expansion marks the third regional growth initiative for Americold in the past 24 months, underscoring its commitment to provide solutions to capacity constrained markets across the APAC region.

ESSENTIAL FACILITIES

"Temperature-controlled warehouses play a critical role in the farm-to-table supply chain," says Richard Winnall, president, international at Americold. "As a market leader, we operate varied types of facilities essential to the temperature-controlled food supply chain, also known as the cold chain. This ensures that products move from manufacturers to end consumers in a safe, reliable, cost-effective manner, with minimal environmental impact."

LEADING THE WAY

By bringing global best practices and delivering top-tier service to the retail and QSR channels, Americold are poised to modernise the industry. "This expansion demonstrates our unwavering commitment to local business, job creation and sustainable facility design. Our New Zealand facilities are leading the way within Americold, achieving significant kilowatt-hour savings, high emission reductions, rainwater harvesting and solar energy generation," said Doug Seccombe, managing director APAC at Americold.

"We have designed this facility to meet the immediate and future needs of our grocery and retail customers. This expansion will enable our South Island customers to grow their temperature-controlled supply chain now and into the future," says Doug. "We continue to provide innovative solutions and best-in-class service to help our customers feed the world."

The 15,240m² site, at 32 Halwyn Drive, is just 10 minutes from Christchurch airport and 20 minutes from the CBD.

WHO ARE WE?

Americold Realty Trust, Inc. is a global leader in temperature-controlled logistics, real estate and value-added services. Focused on the ownership, operation, acquisition, and development of temperature-controlled warehouses, and a legacy of 120 years.

Americold owns and/or operates 19 temperature-controlled warehouses in Australia and New Zealand with 239 facilities across North America, Europe, Asia-Pacific, and South America with approximately 1.5 billion refrigerated cubic feet of storage. Americold's facilities are an integral component of the supply chain connecting food producers, processors, distributors, QSR and retailers to consumers with the mission of "Helping our customers feed the world".

To know more about Americold and how we can partner with you to support your business, visit us at americold.com

Cold Facts talked with Interlogic about a new automated warehouse in Auckland.

In Aotearoa, we often hear about fully automated or "dark" warehouses operating overseas. These facilities have made significant investments in mechanical automation technology and software systems for automatically storing and retrieving pallets, sorting items, and even picking individual cartons.

Until recently, we've only had a glimpse of these technologies in local warehouses, and to view fully automated facilities, one would need to travel abroad. This makes it challenging for us, to envision how we could scale such operations for New Zealand's size and scope.

Additionally, we need to consider how to adapt these technologies for regional cold storage facilities. Nevertheless, robots are arriving at a warehouse near you. They are already here moving materials with precision, like a well-rehearsed ballet.

THE FIRST 3PL IN AUSTRALASIA

The most impressive operation is Cardinal's new automated dark warehouse on the outskirts of Auckland in Drury. This facility covers six hectares and at nearly 30 metres high, it makes a significant impact on the landscape east of State Highway 1.

It is the first fully automated facility of its type and the first dedicated third-party logistics (3PL) automated warehouse in Australasia and, as far as we know, the first in the world.

Advanced technology at this warehouse allows orders to be picked and organised according to the requirements of Cardinal's customers and their end customers.

In true Kiwi fashion, Cardinal has leveraged its 30 years of experience to innovate automation technology for 3PL operations. They are rethinking how technology components are utilised and are integrating their current warehouse management software to enhance these systems.

Cardinal chose this approach because their existing warehouse management system (WMS) is working effectively in their traditional warehouses, managing client specific stock rotation rules and end customer requirements for presentation, labelling, and delivery.

LOCAL SUPPLIER WITH HYBRID MODEL

Interlogic, supplier of the WMS, working in conjunction with Cardinal and Daifuku, has redefined the roles of WMS and warehouse control system (WCS) challenging the typical relationship between the two systems.

Operational rules in the WMS, refined over time, are typically used to drive labour intensive conventional warehouse operations. These are utilised to create the tasks for the WCS system to execute, simplifying the integration and minimising duplication of data between the two systems.

Using the same WMS across the business enabled Cardinal to gradually transition customers from conventional warehouse layout to fully automated by operating both conventional and automated models, using a single instance of the WMS as a hybrid model.

Issuing tasks to operators on the conventional side and at the same issuing tasks to the automation systems and combine on the output from the same WMS system.

TIMELINE

Stage 1

Went live in Feb 2024 brought onstream and initial 12,000 ASRS Pallet locations

Stage 2

Went live Feb 2025 increased the number of ASRS Pallet locations to 60,000, plus 65,000 carton buffering and picking, two robots for depalletising, building mix layered pallets, plus mixed carton picking.

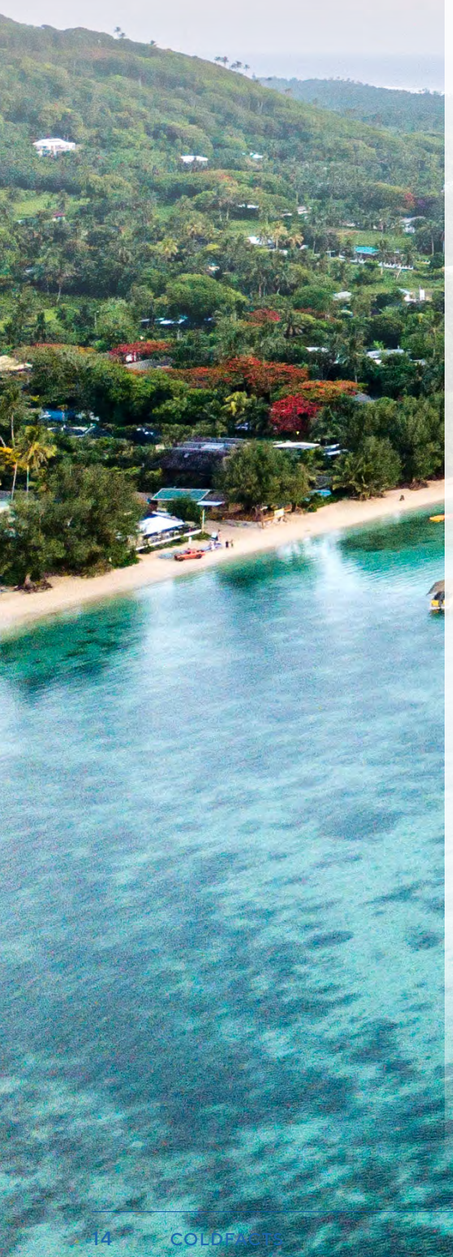
Stage 3

Due to go live October 2025 will bring the total number pallets in ASRS to 115,000 and increase processing capability.

WATCH VIDEO HERE

interlogic

interlogic.co.nz



OFF-GRID COLD STORAGE: IS IT VIABLE?

Engineer Horia Grecu, from Sustaineering NZ, shares the results of an off-grid cold storage facility concept prepared for a client in Rarotonga.

INTRODUCTION

The challenge for a successful engineering project is to identify the right proportion between solar power, grid power, battery-based power storage, thermal storage, and back-up diesel gensets power, and which suits the electric and thermal requirements of a specific storage facility.

This design concept did not progress to the build phase due to local funding constraints, but the case study remains useful for insights into the technology stack required.

ECONOMIC CONDITIONS

There are locations and circumstances where off-grid solutions are economically viable for cold and refrigerated storage facilities, such as the Pacific Islands. This concept was predicated on the following situation in Rarotonga in 2023.

Utilities

- Electric power is generated mostly by diesel generators, plus solar, and a small amount from hydro and wind turbines.
- The reliability of the power supply is low, with frequent interruptions, so having power back-up with a diesel generator is a must.
- The electricity price was $0.90 NZD/kWh, about four times higher than New Zealand.

Trade

- Rarotonga imports meat, dairy, and horticultural products in cold and refrigerated containers, mainly from New Zealand.
- Perishable exports are mainly tropical fruits and a small supply of fresh fish. Rarotonga has a bi-monthly refrigerated/cold container picking up tropical fruits, which leads to most of the harvest being thrown away as there is minimal cold storage available for the two weeks interval.

CONCEPT DESIGN

The off-grid cold storage concept design prepared for our client is shown in Figure 1.

The usable cold storage capacity is 400 metric tonnes, divided over four cold storage rooms with 500 cubic metre internal volume, a volume utilisation factor of 0.4, product weight density of 500kg/cubic metre (4 x 500 x 0.4 x 0.5 = 400 metric tonnes).

The rest of the cold rooms and surrounding areas, as shown in Table 1, are required for supporting the operation of the four cold storage rooms. This includes the loading dock, ELA / corridor, airlock and fast freezer.

ENERGY CONCEPT

Cooling and associated refrigeration systems account for up to 80% of the power consumption of a refrigerated storage facility. The design intent was to find a feasible solution to have this energy provided by solar power. The solution we adopted is Thermal Storage based on Phase Change Material (PCM) technology.

PCM technology is similar to ice storage where a mixture of ice and water maintain the cooling fluid at the quasi-constant temperature of 0°C, the melting temperature of ice and the associated latent heat.

PCM technology has materials with energy storage capability in the form of latent heat with melting/congealing points covering a large temperature range -50°C to + 90°C, depending on PCM formulation. The PCM formulation suitable for this project was RE -25, which has a freezing temperature of -26°C and a melting point of -25°C, with a latent heat of

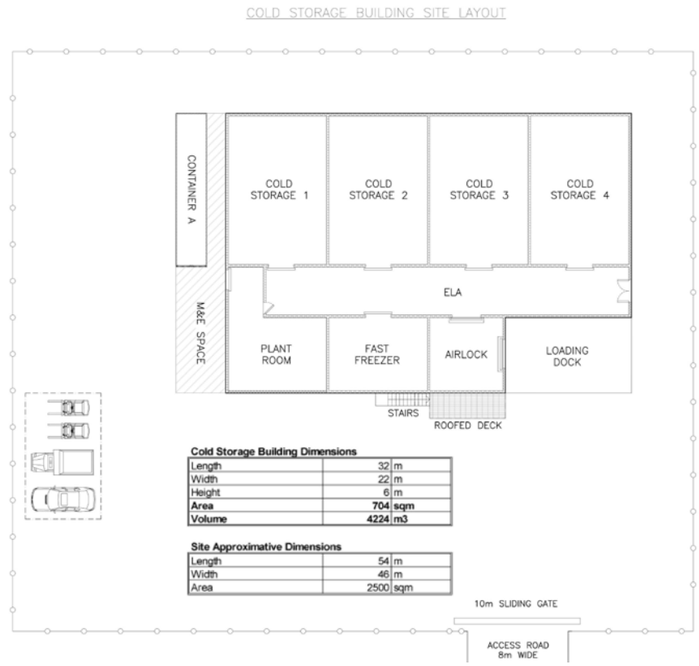


Figure 1: Cold storage design concept

Room Name	Length	Width	Height	Area	UM	Notes
Cold storage 1	12	8	6	96	sqm	
Cold storage 2	12	8	6	96	sqm	Individual room temperature control range from -25 to +4° C
Cold storage 3	12	8	6	96	sqm	
Cold storage 4	12	8	6	96	sqm	
Subtotal cold storage				**384**	**sqm**	
ELA	32	4	6	128	sqm	Typical operating temperature +4° C
Plantroom	8	6	6	48	sqm	Plantroom thermal storage & distribution manifold + E&C board
Airlock	6	6	6	36	sqm	Typical operating temperature +4° C
Fast freezer	8	6	6	48	sqm	Typically -25° C with strong air mixing
Total cold area				**644**	**sqm**	
Loading dock	10	6	NA	60	sqm	Roof only
Total building footprint				**704**	**sqm**	

Table 1: Room schedule

349 kJ/kg (compared with water/ice latent heat of 334 kJ/kg), which is a high energy storage density.

THERMAL STORAGE CAPACITY

The thermal storage design required capacity was 2,000 MJ at a temperature of – 25.5°C (+/- 2.5°C).

During the design phase, after adding safety factors, we ended up with an approx. 2,400 MJ thermal storage, combing PCM sensible and latent and the glycol mass for the design temperature range. as shown in Table 2.

The latent heat of the PCM contributes more than 80% to the storage capacity!

COOLING SYSTEM

The cooling system consists of a primary and secondary system, both linked to the PCM based thermal storage, which acts as a decoupler between the primary and secondary systems, as shown in Figure 2.

Thermal storage charging is by the primary cooling system consisting of 2 x 45 kW cooling capacity ammonia chillers. The charging time from -24°C to -30°C (thermal storage "empty" to "full" conditions) is 7.4 hours.

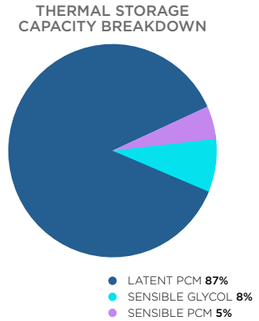
Thermal storage discharges to the secondary cooling circuits towards consumers. Each room has its own secondary circuit supplying glycol at the required flow and temperature to the room FCUs so that the room can achieve and maintain the required temperature.

The facility cooling demand is variable, depending on the operational requirements of the facility such as quantity and frequency of containers unloaded, number and frequency of palletised local deliveries, number of storage rooms used as refrigerated storage (at<-20°C) or used as cold storage (at +4°C), frequency of door opening for forklift operation.

PCM BASED THERMAL STORAGE DESIGN DATA

Specific heat and mass of components			
Glycol 50%	3.15	kJ/kg*K	
PCM Latent Heat	349	kJ/kg	
PCM Specific Heat	3.4	kJ/kg *K	
PCM mass	6000	kg	
Glycol 50% mass	10000	kg	
Operating temperatures			
Glycol Low Temperature	-30	deg C	
Glycol Hi Temperature	-24	deg C	
Glycol DT	6	deg C	
Capacity breakdown			
Latent PCM	2094	MJ	87%
Sensible PCM	122	MJ	5%
Sensible glycol	189	MJ	8%
Total thermal storage	**2405**	**MJ**	**100%**

Table 2: Thermal storage capacity breakdown



Conclusion

The latent heat component of the Phase Change Material is essential in achieving a 2400 MJ thermal storage at a quasiconstant glycol temperature (-30 to -24 °C)

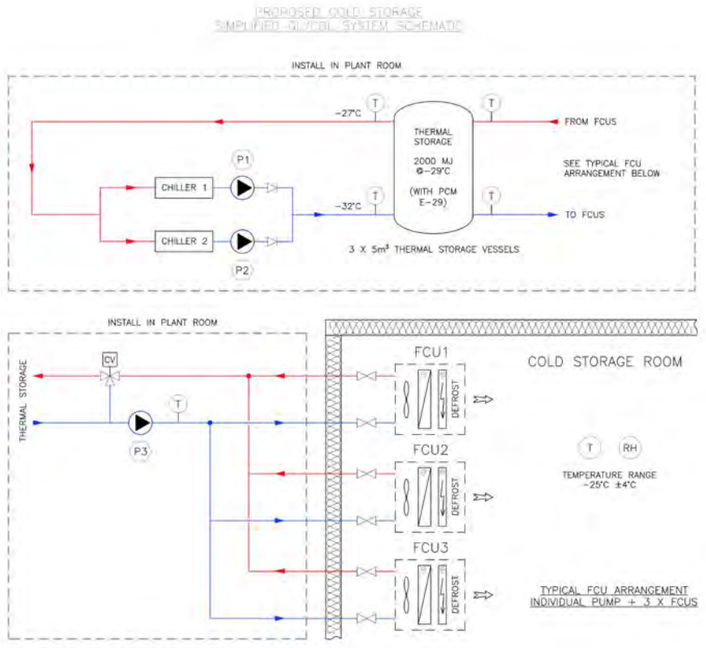


Figure 2: Schematic of cooling system

However, we estimate the thermal storage capacity of 2400 MJ to be sufficient for at least 72 hours of operation with the glycol temperature maintained in the range of -30 to -24°C.

The 72 hours interval allows for:

- Maintenance and service of the primary cooling system (chillers, cooling water system: cooling towers, pumps, etc).
- Maintenance and service of most components of the power supply system: Solar panel inverters, battery bank, diesel generators, main electrical and controls board.
- Three days with poor solarisation. Even on cloudy days, solar panels with a peak capacity of 140 KW, will deliver at least 25% of the nominal power during the daytime hours.

RISK MITIGATION

Redundancy, back-up, and resilience of systems were a key consideration. The power system has in-built redundancy: two banks of PV panels and inverters, two banks of batteries, two diesel generators, etc, which allows reliable power supply at 50% of peak capacity in case of equipment failure. The diesel generators — while expensive to run — can keep the facility fully operational in case of catastrophic failure upstream in the electrical system (PV panels, inverters, and battery bank circuitry).

The primary cooling system design uses the same strategy, with two chillers, two cooling towers, two rain storage tanks and the 1+1 pumps and strainers configuration. This enables the system to run at 50% capacity in case of singular equipment failure.

On the consumer side, each room has a dedicated connection to the thermal storage with one pump, one mixing valve, one glycol temperature sensor — each of which constitute single points of failure.

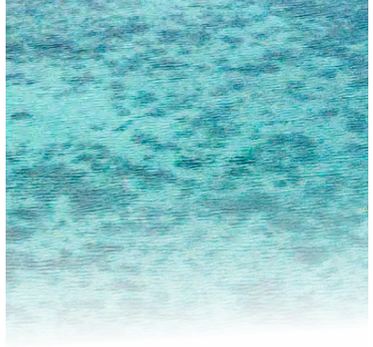
The failure risk is mitigated by keeping replacement parts on site and providing easy access for service and maintenance.

At room level, each room has at least two fan coil units (FCU). The cold storage rooms have three FCUs, which provides a degree of redundancy in case of single equipment failure. FCU selection took into account the importance of minimising the required spare parts to be on site: e.g. all FCUs are using the same EC fan model, with different numbers of fans and speed depending on FCU required capacity.

CONCLUSION

An off-grid cold storage facility is an economically attractive option for regions with high power prices and an unreliable electric grid, such as in the Pacific Islands.

For New Zealand conditions, using low temperature glycol systems coupled with PCM thermal storage can drastically reduce the size of grid-connected power. Additionally, using solar power in parallel with grid power to charge the thermal storage has the potential to drastically reduce the power consumption.



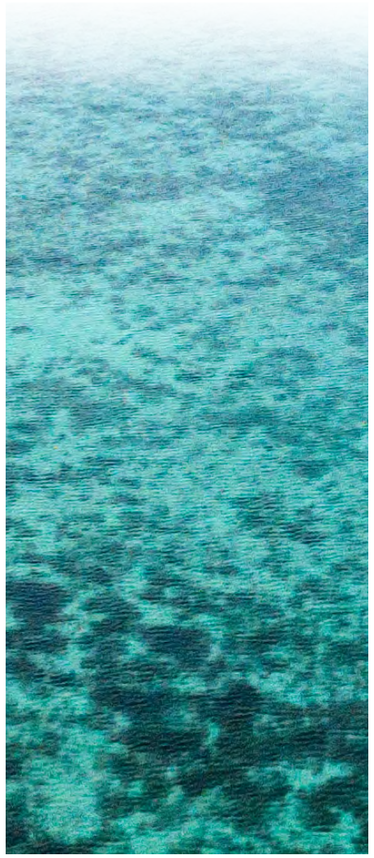
PROJECT COLLABORATORS

Stuart McKenzie (refrigeration)
Comprex Industries NZ
Axel Geisenhof (solar power)
Eco Engineering & Commissioning
Horia Grecu (engineering)
Sustaineering NZ

GET IN TOUCH

horia@sustaineering.co.nz
sustaineering.co.nz

VIEW ADDITIONAL PROJECT INFO HERE



WHAT WILL NEW ZEALAND BE KNOWN FOR IN 2050?

The Boston Consulting Group's (BCG) recent report, "Future of NZ Inc: What Will New Zealand Be Known for in 2050?", outlines five key ecosystems poised to drive the nation's future growth: agriculture, space and satellites, green tech, medicine, and creative industries. Among these, agriculture and green tech present implications for New Zealand's cold storage industry.

The report emphasises that New Zealand's agriculture sector, which contributes approximately NZD 40 billion in annual exports, can enhance its global leadership by adopting sustainable farming practices.

AGRICULTURE 4.0: REVOLUTIONISING THE AGRI-FOOD SECTOR

Agriculture 4.0 refers to the integration of advanced technologies—such as the Internet of Things (IoT), artificial intelligence (AI), and robotics—into farming practices to enhance productivity and sustainability. For New Zealand, a country renowned for its agricultural exports, adopting Agriculture 4.0 is pivotal for maintaining a competitive edge in global markets.

Implications for cold storage

1. **Enhanced supply chain transparency:** Implementing IoT sensors can provide real-time data on produce conditions during storage and transit, ensuring optimal temperature and humidity levels are maintained. This transparency not only preserves product quality but also builds trust with international buyers who demand stringent quality controls.
2. **Predictive maintenance:** AI-driven analytics can forecast equipment failures in cold storage facilities, allowing for proactive maintenance. This reduces downtime and prevents potential losses due to equipment malfunctions.
3. **Energy efficiency:** Advanced technologies can monitor and optimise energy consumption in cold storage units, aligning with sustainability goals and reducing operational costs.

GREEN TECH: PAVING THE WAY FOR SUSTAINABLE PRACTICES

The global shift towards sustainability positions green tech as a cornerstone of future economic development. BCG predicts that the value of the global green economy will reach NZD 9.4 trillion by 2030, presenting vast opportunities for countries like New Zealand.

Implications for cold storage

1. **Renewable energy integration:** Transitioning cold storage facilities to renewable energy sources, such as solar or wind power, can significantly reduce carbon footprints. This aligns with global sustainability standards and appeals to environmentally conscious consumers.
2. **Eco-friendly refrigerants:** Adopting natural refrigerants with low global warming potential minimises environmental impact and complies with international regulations aimed at phasing out harmful substances.
3. **Green building certifications:** Constructing or retrofitting facilities to meet green building standards can enhance energy efficiency and demonstrate a commitment to environmental stewardship.

NAVIGATING FUTURE UNCERTAINTY WITH MEGATRENDS

BCG's analysis of megatrends affecting New Zealand highlights the increasing frequency of natural disasters, the growth of the green economy, and technological advancements.

Implications for cold storage

1. **Climate resilience:** With New Zealand being susceptible to natural disasters, cold storage facilities must be designed to withstand such events, ensuring the integrity of stored goods.
2. **Technological adoption:** Embracing advancements like automation and AI can streamline operations, reduce labour costs, and enhance precision in temperature control.

STRATEGIC FOCUS AREAS FOR EXECUTIVES

BCG's "Top 10 Focus Areas for New Zealand Executives in 2024" provides a roadmap for navigating post-Covid challenges and seizing new opportunities.

Implications for cold storage

1. **Productivity enhancements:** Investing in technologies that improve operational efficiency can offset rising costs and maintain competitiveness.
2. **Supply chain resilience:** Diversifying supply sources and incorporating flexible logistics strategies can mitigate disruptions, ensuring continuity in operations.
3. **Carbon budgeting:** Developing internal mechanisms to account for carbon emissions prepares companies for future regulations and aligns with global sustainability trends.

CONCLUSION

The convergence of Agriculture 4.0 and green tech presents a transformative opportunity for New Zealand's cold storage industry. By integrating advanced technologies and sustainable practices, the sector can enhance efficiency, reduce environmental impact, and meet the evolving demands of global markets. Proactive adaptation to these trends will position New Zealand's cold storage operators at the forefront of innovation, ensuring long-term success in a rapidly changing landscape.

Source: Boston Consulting Group | Read more

BREAKTHROUGH FREE TRADE DEAL WITH GULF

New Zealand's Free Trade Agreement (FTA) with the Gulf Cooperation Council (GCC), signed on 31 October 2024, marks a significant diplomatic and economic milestone. The GCC—comprising Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE—is already New Zealand's seventh-largest export market, purchasing NZ$2.6 billion in goods annually, primarily dairy and meat. Though existing tariffs were modest (typically around 5%), the FTA enhances market access and boosts New Zealand's trade credibility, making it only the third FTA the GCC has ever signed.

Negotiations began in 2006 and advanced quickly, with a deal at the official level reached in 2009. However, a series of diplomatic tensions, especially involving Saudi Arabia over New Zealand's live sheep export ban, delayed progress. The controversial "Saudi sheep deal," a taxpayer-funded initiative to improve relations, stirred political backlash in New Zealand but helped thaw ties.

Ultimately, years of diplomatic persistence paid off. The agreement is expected to solidify New Zealand's presence in the Gulf and act as a gateway to the wider Middle East. With both sides having complementary trade interests—New Zealand exporting food, and the GCC supplying energy products—the FTA lays the groundwork for long-term strategic cooperation.

Source: The Diplomat | Read more

EYES ON INDIA

In March 2025, New Zealand and India announced the resumption of negotiations for a comprehensive Free Trade Agreement (FTA), aiming to enhance bilateral trade and economic cooperation. This initiative seeks to address both tariff and non-tariff barriers, facilitating smoother access for exporters and investors in both countries.

India, as one of the world's largest and fastest-growing economies, presents significant opportunities for trade expansion. With a population surpassing 1.4 billion and projections to become the third-largest global economy by 2030, India's market is increasingly vital for New Zealand's trade diversification strategy. Currently, India ranks as New Zealand's 12th largest two-way trading partner, with total trade amounting to NZ$3.14 billion annually as of December 2024. New Zealand's exports to India, valued at NZ$718 million, primarily include forestry products, iron and steel, horticulture, wool, aluminium, and dairy.

India's Trade Minister Piyush Goyal stated the pact could boost trade tenfold over the next decade. However, challenges remain, particularly around tariffs on dairy products, which India is reluctant to lower due to concerns about its small farmers. Both sides agreed to respect each other's sensitivities as negotiations progress.

Source: Ministry of Foreign Affairs & Trade (MFAT) | Read more

ACCTS AGREEMENT

In November 2024, New Zealand signed a trade deal with Switzerland, Costa Rica, and Iceland. The Agreement on Climate Change, Trade, and Sustainability (ACCTS) seeks to eliminate tariffs on hundreds of sustainable goods and services, aligning trade practices with environmental objectives.

Source: Reuters | Read more

FOOD EXPORT MARKET REVIEW

New Zealand's food export sector has faced challenges over the past year, with overall goods exports down 1.4% compared to 2023. Dairy exports fell by $1.1 billion due to lower prices, despite increased milk powder volumes. Meat exports dropped 3.4%, driven by weaker prices and a significant $1 billion fall in exports to China, although strong U.S. demand for beef helped offset the decline. Wine exports also fell 10% ($230 million) amid sluggish global demand and high stock levels. However, fruit exports were a bright spot. Apple and kiwifruit exports surged, reaching $4.6 billion—up nearly 25% year-on-year. Kiwifruit exports alone rose 29% to $3.3 billion, led by the high-value gold variety. Apple volumes rebounded 17.5% after Cyclone Gabrielle's impact in 2023. The EU became the largest kiwifruit market, benefiting from tariff-free access under the EU-NZ Free Trade Agreement. These gains helped cushion the broader downturn in food and fibre exports.

Source: MFAT market intelligence Q4 2024 | Read more

STRONG START TO THE YEAR FOR RED MEAT EXPORTS

New Zealand's red meat sector saw a strong start to the year, with export values in January increasing 28% year-on-year to $927 million, according to the Meat Industry Association (MIA).

"The sector experienced solid demand across all major markets, contributing to a significant uplift in export value," says MIA Chief Executive Sirma Karapeeva.

"This reflects both the ongoing recovery in global demand and the ability of New Zealand's red meat sector to adapt to shifting market dynamics.

The US led the way, with exports increasing 64% year-on-year, followed by China (up 10%), the UK (up 58%), and Canada (up 89%).

Key statistics

- Sheepmeat export volumes remained steady at 35,220 tonnes compared to last January.
- Beef exports rose by 6% in volume to 38,788 tonnes and 36% in value to $409 million.
- Tallow was the most valuable export in January at $34 million, followed by casings and tripe ($30 million) and edible offals ($26 million).

Source: Meat Industry Association | Read more

FONTERRA FORECAST

As of 5 December 2024, Fonterra raised the midpoint of its forecast Farmgate Milk Price by 50 cents. This adjustment reflects ongoing strength in the global dairy market, driven by a recovery in demand from Greater China and sustained demand from Southeast Asia.

Fonterra has observed favourable pasture growth across most of New Zealand, leading to an increase in milk production. The cooperative's forecast milk collections for the 2024/25 season are up 2.7% compared to the previous year, reaching 1,510 million kgMS. This increase is attributed to favourable weather conditions earlier in the season, although it is noted that many parts of the country are currently experiencing very dry conditions.

Fonterra has updated its full-year earnings guidance for FY25. On 10 March 2025, the cooperative increased its forecast earnings range from 40-60 cents per share to 55-75 cents per share. These updates indicate a positive outlook for New Zealand's dairy sector in the 2024/25 season, with both increased milk prices and production volumes benefiting farmers.

Source: Fonterra | Read more

HORTICULTURE BASKING IN THE SUN

Changing weather patterns have brought a mix of challenges and opportunities for the horticulture industry. Across orchards, growers have had a good run with exceptional fruit quality, a testament to the favourable growing conditions that have supported healthy crop development. A combination of somewhat normal rainfall, optimal temperatures, and well-timed sunshine has contributed to enhanced fruit size, flavour, and overall yield. These conditions have benefited current harvests and reinforced New Zealand's reputation as a global leader in premium horticultural production. With international markets increasingly demanding high-quality produce, the industry's ability to maintain excellence despite economic environmental shifts highlights the dedication and expertise of local growers. As the season progresses, continued monitoring and adaptability will be key to sustaining this success and maximising market opportunities.

Source: Hawke's Bay Fruitgrowers Association | Read more

STRONG RETURNS FORECAST FOR KIWIFRUIT

Zespri has released its initial forecast for the 2025/26 kiwifruit season, projecting strong Orchard Gate Returns for growers, supported by positive early harvest conditions and high demand across key global markets. Over 205 million trays (738,000 tonnes) of fruit are expected, with the industry packing more fruit at this point in the season than ever before. CEO Jason Te Brake highlighted improved fruit size and favourable foreign exchange rates as contributing factors, though noted risks such as potential fruit quality issues and global market uncertainty.

Strong customer demand in Europe, China, and North America is expected to support sales momentum. Zespri also announced the commercialisation of 170 hectares of RubyRed Kiwifruit (RRK) in Italy over the next two years. This is the first use of a 2019 grower-approved allocation allowing up to 1,000 hectares of offshore planting. The move supports Zespri's 12-month supply strategy and aims to maintain market presence and shelf space during New Zealand's off-season.

RRK has seen growing success, with three million trays packed in New Zealand and new market entries, including the US. The company remains focused on delivering strong value to growers while managing market and operational risks proactively.

Source: Zespri | Read more

ACEDOORS

AceDoors supply, install and service a comprehensive range of doors in the New Zealand market.

With over 30 years' experience in the temperature controlled industry, we have the expertise to deliver the right solution for your needs.

Combined with roller shutter doors, dock levellers, rapid doors and duradoors, we provide doors for every area of your business

acedoors.co.nz

COSELL

CoSell is a leading New Zealand-owned refrigeration company, specialising in providing refrigeration solutions for various sectors including commercial and industrial coolstore facilities. With a strong presence across New Zealand, CoSell provides sustainable, energy-efficient refrigeration solutions tailored for food producers, distributors, and cold storage facilities.

Their CO_2 systems offer a future-proof alternative to synthetic and ammonia refrigerants, aligning with global climate goals and refrigerant phase-outs. CoSell handles every aspect of the process from custom design and engineering to full installation and ongoing maintenance. Their expertise includes high-performance CO_2 transcritical systems for both medium and low-temperature environments, ensuring optimal product preservation and minimal energy use.

cosell.co.nz

ENERSYS®

EnerSys® is a global leader in stored energy solutions for industrial applications and designs, manufactures, and distributes energy systems, battery solutions and support services to customers in over 100 countries. The company has four lines of business: energy systems, motive power, specialty and new ventures. Energy systems combine power conversion, power distribution, energy storage, and enclosures, for use in the telecommunication, broadband and utility industries, uninterruptible power supplies, and applications requiring stored energy solutions. Motive power batteries and chargers are utilised in electric forklift and industrial electric powered vehicles. Specialty batteries are used in aerospace and defence applications. New ventures provides energy storage and management systems for various applications.

enersys.com

WAGNER GROUP GMBH

The WAGNER Group GmbH has been active as an innovative supplier of integrated fire protection solutions since 1976. Headquartered in Germany, WAGNER has around 800 employees and is represented at 25 locations in 15 countries worldwide. As a technology leader in fire detection and prevention, the company holds more than 700 patents. Our core competencies include fire detection (TITANUS®) and fire prevention (OxyReduct®).

The Australia/New Zealand office is headed by Oliver Morfeld and is located in Port Melbourne, Australia.

wagnergroup.com

BCD GROUP

BCD Group is a New Zealand-owned consultancy that specialises in engineering, planning, and surveying services. They have extensive experience in the design of cold/cool store facilities and offer a comprehensive range of capabilities in-house, providing a seamless experience for their clients. Their services include geotechnical, civil, traffic, structural and fire engineering along with planning, environmental and resource management services.

bcdgroup.nz

DIMOND ROOFING®

Dimond Roofing® is the largest roll-former of long run roofing material in New Zealand, with an extensive national presence, supplying product to, commercial and residential builds. All our products are manufactured in New Zealand to the highest of standards.

Dimond® is widely regarded as industry experts, with a dedicated technical team for assisting installers and specifiers.

With decades of roofing expertise, Dimond Roofing® presents Dimond Warm Roofs, widely used around the globe for superior performance. Experience unparalleled comfort with Dimond Warm Roofs designed for optimal comfort and energy efficiency, Dimond Warm Roofs provide controlled indoor environments regardless of external conditions, thanks to advanced technology.

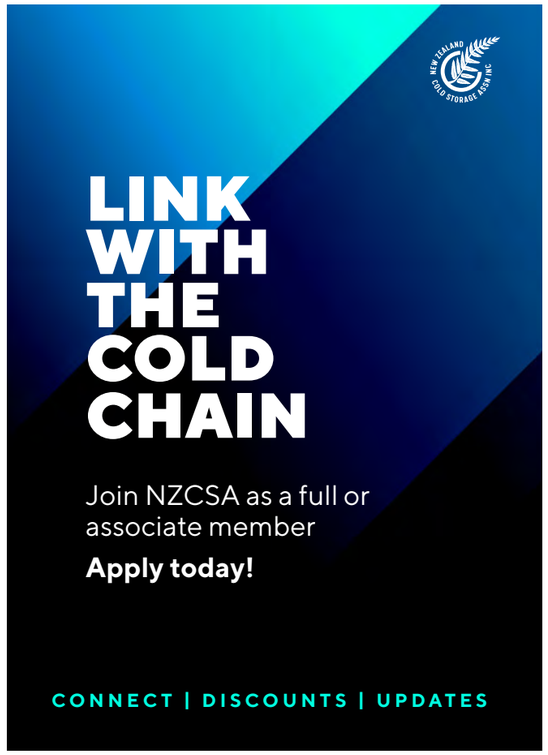
dimond.co.nz

GVI LOGISTICS

GVI Logistics was established in 1992 and is a proudly 100% New Zealand-owned and managed company committed to providing comprehensive supply chain solutions.

GVI specialises in freight forwarding, customs brokerage, warehousing, and distribution services across a range of temperature zones. GVI leverages technology and a global network to ensure efficient, reliable, and cost-effective logistics solutions tailored to our clients' needs. GVI's commitment to excellence and customer satisfaction drives us to deliver seamless and innovative services, making us a trusted partner in the logistics industry.

gvi.co.nz



CONVERSATION WITH CONNOR

Cold Facts sat down with the Connor Consulting team to learn more about them.

MARK

DIANA

PETER

CONNOR CONSULTING

connorconsulting.co.nz
admin@connorconsulting.co.nz
03 940 7124

WHAT SERVICE DOES YOUR COMPANY PROVIDE?

Connor Consulting is a specialist engineering consultancy with decades of experience in the cold storage industry. We are highly skilled in the planning, design and construction of cold stores and other industrial buildings.

Our business is employee owned so you can be sure we have got skin in the game on every project, every day, just like our clients.

Mark Westphall and Diana Barr are the faces members usually see at the NZCSA conference. The rest of our leadership team includes Peter Hampton, Andrew Pauli, and Amir Malek.

HOW LONG HAVE YOU BEEN INVOLVED IN COLD STORAGE?

When Peter was in his final year at university, Ian Connor came to his university and interviewed half the class. "I'm still waiting for a reply to that interview", quipped Peter, "but it was only 1989 and good things take time".

The first cold store Peter helped design was P&O (now Americold Halwyn Drive). 30 years on, Connor Consulting remain with this site and Rhondda Vincent, who drew the original job, is still part of the Connor Consulting team.

WHAT ADVICE DO YOU HAVE FOR COLD STORE OPERATORS?

Just because you can, doesn't mean you should!

There are lots of opportunities that are presented but not all of them are appropriate for every situation. Just like your business is unique, so are your buildings and there are plenty of great innovations that you could employ.

Making sure your advice comes from a place of knowledge and experience, is key to making good decisions. Whether the offering is AI, imported materials, new design techniques or anything else, nothing replaces proper research and quality advice.

WHAT DO YOU ENJOY ABOUT THE NZCSA CONFERENCE?

"Golf, obviously!", exclaimed Mark, who is the only person to have won the NZCSA Golf Tournament two years in a row.

Also, the interactions with clients who have become friends over the years. "I enjoy hearing about the challenges and successes in the industry and learning more about the sector."

WHAT IS THE FUNNIEST THING THAT HAS HAPPENED TO YOU IN THE SECTOR?

15 years ago, Diana was doing construction monitoring at SPM in Burnham, in the foundations of the plant room. The ground beams were a metre deep, and a scaffold plank had been set up to get to the interior.

Diana, who was heavily pregnant, jumped down and completed her inspection only to find she was too round to get back out and everyone else was at smoko. "I had to wait for one of the labourers to come back and rescue me!"

With decades of experience and a strong team behind them, Connor Consulting continues to support the industry with dedication, expertise, and a good sense of humour.

NZ COLD STORAGE CONFERENCE 25
24–26 AUGUST 2025 | NAPIER

THANK YOU TO OUR SPONSORS

GOLD
ALLGUARD SAFETY + WORKWEAR
CROWN
Kingspan
Metalcraft Insulated Panels
meTecno
BondorNZ Performance Panels
interlogic
EUROTEC People + Technology + Solutions

SILVER
PHS INNOVATE
CONNOR CONSULTING
First Principles Constructors
PENSA
lightforce solar
NATIONAL METAL FABRICATORS
ulti group
EnerSys
Apollo PROJECTS
COSELL
STORE PRO
Active refrigeration
JUNGHEINRICH
AIR-SOLUTIONS
americold
Dimond Roofing
ARMOUR SAFETY PRODUCTS

BRONZE
Simply Energy
DANLEY
A-GAS TOGETHER WE CAN
PACCON SAFETY
TUATARA STRUCTURES
ADLER
Cool-Safe
NOVASTEEL
DEMATIC
ARA MANUFACTURE | METALBILT
DRONE DOG
ELITE PROPERTY WASH
BCD GROUP

SUPPORTER
NEW ZEALAND FOOD NETWORK