COLDFACTS

New Zealand Cold Storage Assn Inc

MARCH / APRIL 2023 ISSUE

Inside this edition


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The Rising Cost Of Power

In the past year, geopolitics has brought war, and as a result, the cost of power is on the rise around the globe. Serious issues for a cold storage industry that counts energy as its second largest expense after labor.

The impact on the bottom line is further incentivizing innovation. The rising cost of energy is also accelerating the transition to renewable energy sources for Global Cold Chain Association member companies around the world.

Global Disruptions

"We are looking at increased expenses for energy use, transport and storage, which can affect product quality and lead to supply chain disruptions," says Joris Olbrechts, Director

of Jodifrost, based in Europe. "In worst case scenarios, these disruptions can have global implications such as food waste and environ- mental damage."

"By its very nature, cold storage logistics is energy intensive," points out Raul Fores Valles, Regional Vice President, Southern Europe at Lineage Logistics. "I think what's interesting

is how we react as an industry to the longer- term challenge and opportunity created by this major energy disruption."

Valles says the company is transitioning to renewable energy sources in the long term. "We are also deploying more efficient insula- tion and other technologies that will allow us to reduce our exposure to extreme energy price fluctuations, like the ones we face now."

Because of supply and demand issues, energy disruption has become a common occurrence in the cold chain industry, says Kulsoom Khan, Energy Efficiency Manager at Congebec, based in Canada. "As a result,

companies have started to invest in alternative fuel technologies to produce back- up power such as solar-battery energy storage system and diesel generators."

R.J. Neu, President and Regional Partner at RLS Alliance, makes the point that as the cost of energy rises so does the cost of everything else. "In 2022, we saw about a 15% increase in electricity cost in Southern California," he says. "Today our best option for running our refrigeration equipment is

electricity, and we cannot simply turn it off. When energy costs go up, it hits straight at our bottom line, and it is a cost that we have to pass on to our customers."

"Most power is generated by gas at the moment, and for the foreseeable future,

natural gas will be important, especially in markets where it can be sold at a profit," notes Mike Lynch, Senior Vice President of Engi- neering at United States Cold Storage, Inc. "As a result, a lot of natural gas is exported

to Europe and Asia putting pressure on domestic prices – that's the impact of geopo- litical events."

Short-Term Fixes

Olbrechts suggests that to help control energy costs in the short term, cold storage companies can improve insulation, use energy-efficient refrigeration equipment, optimize temperature control systems and implement demand-response programs.

“Cold storage companies need to be operating as efficiently as possible, and every warehouse should conduct an energy audit to find and close the gaps” Lynch offers. “That will have an immediate impact on the bottom line.“

Lynch adds companies should be investing in technology that reduces energy, looking

at control systems and seeking efficient roof options – anything to reduce energy costs.

Neu says in the short term, companies can undertake maintenance projects and update the building infrastructure. “Make sure doors are sealed and there are no air leaks, and change to more efficient lighting with motion detectors.”

“Recently, there have been calls by various companies to the government to cap energy costs for the food cold storage industry.

This is one way to control energy costs temporarily and for the short term,” notes Khan. “In addition, some companies are also looking into PPAs (power purchase agreements), which are becoming more prominent in North America.”

Long-Term Solutions

“I feel that new innovations in equipment and building materials is key,” Neu suggests. “In the past, if you needed a building colder, you threw horsepower at it, which consumed more energy. With innovations in science and engi- neering, we now have more efficient equip- ment and better control over the horsepower.”

Valles says long-term sustainability efforts take a few different forms at the company. “One is building out our suite of advanced technological solutions, both software and hardware, to improve efficiency within our warehouses, therefore reducing waste and reducing our environmental footprint.”

He adds the second approach is fully automated warehouses that can be built taller, store more in the same footprint and minimize heat entry via the roof – decreasing the demand on the refrigeration system.

“We also see our people as key to reaching our sustainability goals,” Valles explains. “We need talent that’s equipped with the right skills to help us reduce waste and use this cutting-edge technology to the best of its ability.”

“The long-term strategy for energy costs is either procure electricity more efficiently or generate and supply your own,” Lynch says. “Cold chain companies should be making investments in renewable assets, like solar

or wind, that will mitigate the risk of rising prices.” Lynch adds that solution is only available to some operators as it requires capital investment and space.

Lynch supports deploying onsite genera- tion through wind or solar microgrids to cap energy costs as a long-term solution. He sees very limited opportunity for PPAs where the warehouse secures power through renew- able sources, such as grid scale wind and solar farms, and locks in at a fixed priced for anywhere from seven to 15 years. “These agreements are very regional and very rare but do exist,” Lynch says, “I’d love to see PPAs expanded, but federal regulations will likely be an obstacle, and I don’t see them taking off.”

As part of a long-term approach, Lynch believes sustainability should be elevated and emphasized as an issue by GCCA, and a subcommittee should be formed. “I think we need an outreach program to solar companies to bring them to the table,” he says. “GCCA can also play a role in helping operators better understand how solar can be used.”

In addition to investing in energy-efficient equipment and vehicles, Olbrechts says cold chain companies can also implement sustainable packaging and recycling programs to reduce waste.

Regarding the transportation industry, Khan says electrification of the fleet is coming and will greatly help reduce emissions for the supply chain. To minimize food waste, she adds companies have to invest in initiatives to reduce, reuse and recycle wherever possible, such as signing up for a local food bank donation program.

Sustainable Cool

What do sustainable cooling solutions look like? “Ideally, the solution is a new build on a piece of land large enough to give you the space to generate your own electricity and store it,” Neu sums up.

Khans explains these cooling solutions make use of sustainable and energy-efficient materials ensuring either low or no emissions. “For instance, carbon dioxide-based refrigeration versus ammonia-based refrigeration is an example where the latter is a bit less efficient and potentially harmful for the environment,” she says.

In addition to using natural refrigerants, Olbrechts says sustainable cooling utilizes innovative cooling technologies like evaporative cooling or thermal energy storage.

Power Generation

Is it viable for cold storage facilities to become not just power users but power generators and storers? “Yes, if you have the available land around you and in large metropolitan areas, that’s not always the case,” says Neu.

Valles points out that unlike other indus- trial facilities that require constant electricity supplies, cold-storage facilities can be cooled when renewable energy is at its peak, and then the cooling turned off when the supply of renewable energy is low, in effect acting as a thermal battery.

“By cooling our facilities a few extra degrees when sun and wind energy is high, the cooling systems can be switched off for hours or days as required,” he says. “We use advanced temperature control systems connected to weather forecast databases and grid operators to cool our facilities when renewable energy is plentiful and shut down the cooling systems when grids become overloaded.”

“What most people don’t think about is that not only do we use a lot of energy, but we also store a lot of energy in our freezers,”

Khan points out. “In addition, if companies start investing in self-generation technologies, it will become possible to eventually start supplying the grid with energy and contribute to stabilizing and making the energy grid more sustainable."

Lynch says advances in battery storage or microgrids are prevalent. He explains it's basically a small power plant located onsite, and a variety of renewable energy sources incorporate battery storage. "To produce and store energy, especially solar, with batteries extends the window of deployment for renewable energy," he says. "You can never store enough energy as you are limited by size and cost can be prohibitive, but the field is maturing and technology is advancing."

Smart Design/Build

"Warehouse design and construction is important because the primary factor in most warehouses that determines how much energy it will consume to freeze products depends

on how well the warehouse envelope is sealed, insulated and has the appropriate R-value," Kahn points out. "In addition, room design has an impact on capacity and volume, which also affect how efficiently product is frozen in the warehouse."

Olbrechts notes the significant role design and construction play in optimizing building orientation, improving insulation and implementing energy-efficient lighting and HVAC systems.

Neu adds design is extremely important in mapping out the workflow of the building to ensure there are less inefficiencies.

"The significance of warehouse design and construction in sustainability is paramount in my opinion," says Lynch. "Design will determine the efficiency of reducing the electrical consumption of the warehouse, but to be more energy efficient, design is going to cost more." Lynch says it may be 30% more expensive to make energy-efficient choices, but the return on investment may be reducing energy consumption by 30%.

Valles points out the company recently opened a new facility in the Port of Rotterdam, which was constructed to the highest sustainability standards. "The energy-saving design of the facility, combined with best-in-class refrigeration technology and the latest systems for inside temperature control make the site up to 45% more energy efficient than a conventional cold storage facility."

Barriers to Efficiency

Olbrechts counts among the barriers to energy efficiency "high capital costs, lack of understanding or awareness of energy-efficient technologies and concerns over safety and regulatory compliance."

To that list, Neu adds aging infrastructure, cost of replacement in metropolitan markets and the availability of land.

For Lynch, federal regulations are the main barrier to energy efficiency and sustainability. "However," Lynch adds, "the lack of financial capital to invest, lack of human capital to make the right investments and understand where the investments should be applied, and lack of awareness or resources to conduct an energy audit can all be barriers to contend with."

"In my opinion, the biggest barrier to energy efficiency is the company culture itself," Khan points out. “If all employees become invested in making their operations energy efficient, we will be able to solve the majority of our energy-related issues.”

In addition, Khan believes it is very important to educate and spread awareness about energy efficiency in the cold storage industry. “By doing this, we are creating an energy efficiency culture that will help inspire and shape the future of our industry.”

The Future of Cool

“In the past decade, energy production has been shifting from coal and biomass to other more sustainable and renewable energy sources such as wind and solar,” Khan notes. “In addition, the energy infrastructure is evolving across the world with more investments in solar panels, wind turbines and energy storage battery systems.”

“In the past decade, we have seen equipment efficiency get better,” Neu points out.

”We are now also paying a lot more attention to it, as well as how energy consumption and availability affect our bottom line.”

“We are of course impacted presently by the increases in electricity prices across

Europe, but in the long term, we believe the investments we are already making in energy including efficiency-increasing technology, cutting-edge automation and renewables will help us weather future shocks such as this one – while contributing to our net-zero goals,” Valles sums up.

Looking to the future, Olbrechts is excited about the use of magnetic refrigeration and solid-state cooling, which are highly energy-efficient and use no harmful refrigerants. “Both of them are still in the early stages but highly promising.”

Khan thinks carbon dioxide-based refrigeration is eco-friendly and very upcoming in the cold storage industry. “This is one main reason why we chose to build our

new facility, north of Montreal, with a CO2 system,” she adds. “In addition, the use of evaporative cooling technologies is another way to sustainably cool or freeze food products. And hydrogen-based energy storage

is not very common but also another green energy initiative.”

The Internet of Things (IoT) is where Lynch sees technology heading in the near future. “We’re starting to see its prevalence in industry, and we’re starting to get data from our refrigeration systems that allows operators to easily see where inefficiencies exist and bring that data onto intuitive platforms.”

Energy sustainability is also about optimizing, says Valles. “There is a real cost to being unsustainable as that means you’re losing out on efficiency gains, and you’re behind on applying the latest innovations.”

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Input to your Strategy for Adapting to Challenges

Tony Alexander Update

A new migration boom

New Zealand's population has received a boost of almost 1% in the year to February courtesy of the net migration flow soaring from a loss of 20,000 a year ago to a net gain of 52,000.

This turnaround of 72,000 over a 12 month period is the biggest on record, though the biggest downward move was an annual change of 93,000 in March 2021. The pandemic effect has been massive on our migration flows.

The latest result of +52,000 reflects a rise in inflows from 52,000 to 153,000 outpacing a rise in outflows from 72,000 to 101,000 or thereabouts.

The monthly net gain of 11,700 people was the highest on record if we exclude March 2020 when people were flocking back to NZ or not leaving for pandemic reasons.

The 52,000 net gain reflects a net Kiwi loss of 17,000 being offset by a net inflow of foreigners amounting to 69,000 people.

As stated here many times before. None of us had previously lived through a pandemic when covid struck in 2020. So, it is not surprising that many things happened which we did not expect. Equally, none of us has experience of what happens in a post-pandemic environment; therefore, we should not be surprised if things happen which we did not expect.

Already in Australia there is high awareness of the migration surge there which is expected to be at record levels for this year and next. We may be set for a similar situation and there are some major implications – some of which I have already discussed here.

More spending

First, more people mean more spending. The accelerating population growth is of benefit to

retailers and domestic service providers being hit by customers cutting spending in the face of a soaring cost of living, falling housing wealth, warnings of recession, and high interest rates.

However, the effect is unlikely to be anywhere near large enough to offset these negative factors and challenging times remain for retailers particularly through 2023.

Less chance of recession

Second, we might roughly say that a 1% population boost could produce a 0.5% - 1.0% gross domestic product boost. This will mitigate the extent to which the economy goes into recession this year if it does.

Monetary policy firm

Third, less weak growth than the Reserve Bank is looking for to fight seemingly intransigent inflation will keep interest rates up for longer than would otherwise be the case.

Labour availability better

Fourth, more people around mean better ability for businesses to find staff. This probably helps explain the firm reduction in the proportions of businesses saying labour was hard to find in the

This development provides an inflation offset to that coming from extra consumer spending. We can only guess as to whether it will be stronger or weaker than the consumption effect, and for the moment the Reserve Bank will probably choose to play things cautiously.

House pressures will grow

House construction is about to undergo a substantial decline. Because residential construction has a large multiplier impact throughout the NZ economy the falling away of activity leaves the risk of recession on the table but implies downside risks to interest rates which could produce rapid falls through 2024.

Of significance however is the combination of falling house building at a time of accelerating population growth. There be upward pressures on rents, and we can expect substantial debate soon, possibly pre-election, regarding the supply of rental property in the context of the government actively taking moves to discourage its provision by individuals.

There will also be house price implications – especially once the migration boom enters popular consciousness.

At some stage something will come along, and people will look through the current level of interest rates and choose to take short-term financing pain in order to secure a property before the horde returns.

We have all proved that we cannot accurately forecast how the great unwashed sweep into and out of the housing market. But with the stack of delayed buyers getting higher every week, this risk of a dam bursting one day is growing.

To repeat my main housing point of the past 6-9 months – if I were a young buyer and the bank calculations allowed, I would take advantage of the absence of investors and lower prices to secure a property to raise my family. I would not be trying to pick the bottom of the house price cycle.

Another point to consider. The coming enhanced upward pressure on rents will act eventually to encourage more people to buy than sell. It will also encourage investors whose model is not highly reliant on debt financing to look at lifting their purchases because of the coming better returns.

If I were a borrower, what would I do?

There has been upward pressure on bank borrowing costs this week from renewed concerns offshore that inflation will prove harder to fight than previously thought. But there has come some downward pressure today following the March quarter inflation number which at 6.7% was below market expectations of a 7.1% rise and the Reserve Bank's forecast of a 7.3% gain.

The outcome is inflation still much too high for comfort. However, in the context of the Reserve Bank on April 5 withdrawing its warning of further rate rises and saying decisions will be driven by indicators of domestic demand and inflation, the news is good. The chances that the official cash rate will need to be raised at the next review on May 24 have declined.

The chances also that other banks follow those which have already lifted their one and two year fixed mortgage rates since April 5 have declined. They may hold their rates down to grab market share, keeping in mind that the Reserve Bank said on April 5 they did not want mortgage rates falling. They did not say they wanted them to go higher.

If I were borrowing at the moment, I'd probably fix one year but not turn my nose up at a discounted two year rate.

Nothing I write here or anywhere else in this publication is intended to be personal advice. You should discuss your financing options with a professional.

Go to www.tonyalexander.nz to subscribe to my free weekly "Tony's View" for easy-to-understand discussion of wider developments in the NZ economy, plus more on housing markets.

Understanding Workplace Diversity and its Benefits

By 2043, New Zealand is projected to be home to just over six million people, with just over a quarter of the population being Asian, 21 per cent Māori and 11 percent Pacific. These numbers are proof of the changing demography of New Zealand society. Ethnic, gender, and cultural diversity continues to specifically redefine Aotearoa New Zealand. This diversity has now seeped into workplaces and there has been a need to highlight practices and systems which support and encourage workplace diversity. How are businesses responding to diversity in the workplace?

Below we have a snapshot of what diversity in the workplace entails, what are the benefits, the challenges, the types of diversity, and how can employers manage diversity.

What is workplace diversity?

Diversity in the workplace is the simple fact that a business consists of diverse individuals with different characteristics. Workplace diversity is when a workplace comprises of employees with varying characteristics such as sex, gender, race, ethnicity, or sexual orientation. In the modern and digital workplace, workplace diversity is a necessity rather than an afterthought or buzzword. Businesses are no longer restricted to their geographical limits and if they want to reach the world, then they must have a diversified workforce. This diversity can generally appear in the form of culture, religion, gender, or age. It can be a shift in the workforce when there is a rapidly growing labour shortage and newer groups of employees are considering a return to the office.

Benefits of workplace diversity for employers

Research has shown that inclusive teams outperform their peers by 80% in team-based assessments. They were also 1.8 times more likely to be change-ready and 1.7 times more likely to be innovation leaders in their market. Workplace diversity is a serious competitive advantage.

Increased employee engagement- Employee engagement is usually an outcome of workplace diversity. The link is obvious- when employees feel included or respected, they are engaged and involved. Employees who believe their company is committed to workplace diversity, are 80 per cent more likely to believe they work in a high performing organisation.

Reduces employee turnover- Diversity causes all employees to feel accepted, included, and valued. When they feel accepted for who they are, they are happier in the workplace and stay longer. This results in companies with diversity having reduced employee turnover.

Wider talent pool to choose from- By particularly refusing to restrict your perspective, you automatically create a wider talent pool to choose from. When your company is open to diverse backgrounds, it expands its horizons and options.

Variety of skill and talent-Diverse employees bring with them a variety of skill and talent.

Increased profits- Companies with more diverse top teams achieve greater profits. They make better decisions faster which gives them an advantage over others.

Challenges of diversity in the workplace

All these benefits do come with their own set of challenges.

- Communication barriers- In a diverse workplace, you have people from different walks of life, and cultural upbringing. This can lead to communication barriers or differences in opinion.
- Employee requirements- If your employees are from different cultures or age groups, they would also have different requirements.
- Conflicting beliefs- Sometimes employees from diverse backgrounds can have polarising beliefs or opinions. This can be a challenge for managers.
- Generational differences- Age diversity can be a challenge if you have employees from different generations working together.

Types of diversity

- Cultural- Food, language, religion, customs, and traditions make up culture. Cultural diversity can allow your employees to learn from others and enhance their global knowledge.
- Religious- It is important to create a workplace that is accepting of different religions and welcomes these differences. This can happen in the form of offering floating holidays or allowing religious clothing for individuals who wish to pay respect to their heritage or religion.
- Racial- Race is biologically determined. It is different than ethnicity, which is based on learned behaviours. Racial diversity demands sensitivity and empathy from managers and employers.
- Age- Your workplace will always be age-diverse. At any given time, your workforce will employ several generations. With age-diversity it is important to remember to avoid stereotypes that can bias your employees. This bias can lead to ageism. 58 per cent of workers notice age bias when people enter the workforce in their 50s.
- Gender- Gender roles are social constructs that are assigned to individuals at birth based on their biological sex. As we progress, people are moving to a spectrum of gender identities rather than get trapped in binaries of male or female.

Employers should respect these individual choices and ensure the workplace is a safe space for all.

- Disability- If you hire individuals with varying disabilities, it helps your team become diverse and inclusive. It also offers those individuals a chance to get back in the workforce and progress in their career.

How can you improve and promote workplace diversity in your business?

Recruit from a diverse talent pool- The first step in improving workplace diversity is to recruit from a diverse talent pool. Are you broadening your horizons? What kind of life experiences are you looking for? Are you willing to consider unconventional employees with the right attitude?

Have a diverse recruiting team- Unless you have a diverse recruiting team, you will have trouble paying attention to workplace diversity. They would know what to look out for and how to spot talent for your team.

Educate employees- Diversity and Inclusion initiatives are a good way to educate employees and improve sensitivity. If your employees understand what workplace diversity is, they would be more welcoming and appreciative of diverse employees and their perspectives.

How to manage diversity in the workplace?

Prioritise communication- Communication can solve the challenges that diversity may bring. Prioritise open, honest, and regular communication. Encourage employees to speak up and have open channels of conversation between teams. With diverse groups, its also best to be clear and specific.

Encourage employees to work in diverse groups- Sometimes employees can prefer working in their comfort zone. They may not want to work in diverse groups generally or with people they believe they may not understand. You should try to challenge their notion. Use workshops, team meetings or team activities to let employees mingle and get comfortable. You can also host social events or catch-ups to make diverse groups interact socially with each other.

Be open-minded– Keeping an open mind means being open to change, being confident, and being calm when things get tricky.

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MFAT Update: Monitoring Global Supply Chains

Reliability of global sea freight has continued to improve throughout the quarter. Shipping giant Maersk noted in a recent industry newsletter that supply chains are “finally beginning to stabilise and find equilibrium.” While prices and delivery times have not returned to pre-COVID levels, some level of disruption has become widely accepted across the industry as ‘business as usual.’

S&P Global Market Intelligence attributes steadier supply chains to slower demand. For example, US container import volumes have been falling for eight months, and March 2023 levels were 23% lower than March 2022. As the pressure on sea freight has reduced, supply chains have rebalanced.

It may take time for the benefits of falling global shipping prices to be fully realised in New Zealand due to factors such as our distance from major global supply lines, recent weather events, and inflation.

Maersk and Mediterranean Shipping Company have announced(external link) that they will end their 10-year alliance in 2025. With only a handful of major shipping companies operating on a global scale, alliances can enable the partners to offer their customers better coverage of trade routes than if they were operating individually. The implications of the announcement are not yet clear. While it could lead to reduced coverage on certain routes, it is also possible that it could help to boost competition and bring down prices.

Maersk has withdrawn its Coastal Connect service from New Zealand. This was a dedicated coastal shipping service introduced last year that connected Auckland, Tauranga, Nelson, Timaru, and Lyttleton. Maersk will now use the Port of Melbourne as a hub instead, which could improve shipping capacity on trans-Tasman routes. Domestic coastal shipping services are still available in New Zealand through another carrier, Pacifica Shipping, which has been in the market for over 30 years. International lines can also sell space on the domestic legs of their voyages for coastal shipping.

For the full report update click here

Evaluating automation for cold storage: Key considerations

Automation such as palletizers, automated storage and retrieval systems (ASRS), conveyors, automated picking solutions, automated truck loading/unloading systems, and other types of material handling equipment (MHE) have a reputation for moving large volumes of inventory with high levels of accuracy.

These systems can be highly beneficial from labor, safety, food quality, throughput, and traceability standpoints. However, cold storage businesses face challenges that other “dry” warehouses never worry about. These challenges, which we’ll touch on throughout this piece, are critical factors in determining how well automation systems fit within these facilities.

Like any technology, it’s critical to understand the business requirements, strategy, and fit before investing. To properly evaluate automation in your cold storage facilities, it’s best to bring vendors or consultants onsite to discuss your unique parameters.

This includes:

- Automation and labor
- Strategy and fit
- Order profiles and logistics
- Warehouse design
- Cost considerations

With automation, there are typically large, upfront capital expenses. This puts extra pressure on the business to get automation right. Here we offer a primer to help you understand many of the critical factors to determine the right solution.

Automation & labour

Across the world, workers are generally choosing less strenuous jobs compared to warehouse work. In the U.S., the shrinking availability of warehouse labor creates a highest-bidder scenario where workers may choose to “warehouse hop” for better wages. In Europe, many businesses use temporary workers and experience high turnover. Because of the harsh environments, it’s harder to attract warehouse workers in cold storage. Incentivizing with higher wages may level the playing field for recruitment in some cases, but many governments place regulations on cold chain labor that reduce the productivity of these resources. For example, employees in a cold environment are often permitted to work 50 minutes each hour and are given the remaining 10 minutes to warm up. While this is an important practice to maintain worker safety, it often comes with the side effect of hiring more people to make up for the lost work time. The ripple effect of adding people goes beyond wages. More people leads to more equipment such as forklifts and RF scanners. Also, more hands on the floor could increase the chances for data logging errors, mispicks, or damaged products in transit.

Put these conditions on top of the low availability of warehouse labor across all industries, and you begin to understand why it is difficult to sustain manual labor in cold chain. These conditions make automation a great fit. However, there are many other factors to consider.

There is a perception that technology such as automation and robotics take jobs away from the community. Automation doesn't steal jobs; it changes them. Not many people want to work in -24˚C (-11˚F) temperatures while moving 50kG (110 lbs.) boxes. By introducing these systems into the warehouse, you automate jobs people generally find undesirable. Meanwhile, automation creates new jobs in management, maintenance, and repair. It's a shift of employment opportunities that likely appeals to younger generations more interested in managing technology compared to walking 16 km (10 mi) every shift.

Strategy & mindset

In some scenarios, automation delivers ROI in a relatively short window. But for many businesses, you're playing the long game. The time to value for these investments varies depending on the steel, existing resources, warehouse design, and many other factors. But, over time the productivity gains, higher efficiency, and cost reductions surpass the upfront costs. As a long-term strategy, the savings over the duration of your technology's lifespan (after recovering the initial investment) offer pure profit to the business while competitors fight over labor resources to keep up.

Businesses with short-term strategies may need to think differently about automation. Many third-party logistics (3PL) providers operate on one-to-three-year contracts with their customers. This makes automation decisions difficult. Automation investments made for one customer may not work for another customer. This could lead to costly and unjustifiable retrofitting or other workarounds. In these scenarios, and for industries that experience a lot of disruption, robotics such as automated guided vehicles (AGVs) or autonomous mobile robots (AMRs) may be a better option. These technologies can be moved to other buildings and leasing options might work better in terms of the pricing structure.

Fully-automated warehouses tend to see a better ROI than semi-automated warehouses. Even though costs may be higher for full automation upfront, many businesses that choose semi-automated strategies end up spending more on labor — offsetting the reduced steel, electronics, and programming requirements of a semi-automated operation. However, the right solution depends on the unique needs of each business. For example, a goods-to-person model may be ideal for some businesses. Here, automation delivers materials directly to workers for picking, packaging, and shipping. This makes the workers' jobs easier, increases safety, and reduces damaged goods. This configuration works for cold or ambient buildings.

Warehouse design

It's cheaper to build up than build out. In Europe, this is key as space is very limited and expensive, especially in highly populated urban areas. This is especially important in cold chain where products can only be exposed to non-freezing temperatures for so long before they're considered lost. And you can only build up to 15 m (50 ft.) for manually-operated warehouses. With automation, the sky is the limit.

In terms of building a blueprint and implementing automation, greenfield sites are ideal. However, it's possible to retrofit warehouses for automation. It's most beneficial to retrofit if the existing infrastructure and operational model is falling behind competitors, creating pricing or productivity gaps in the market. Retrofitting is also a valuable solution in the case of warehouse expansions, or when a business experiences steep changes in volume.

When retrofitting, it's important to consider how existing systems and personnel will fit with new automation systems brought in. How will you continue to run your operations during the retrofit project? How much downtime can your business afford? Often, without a solid strategy that factors all the variables, you could be introducing new challenges. To reduce the risk of retrofitting, finding a partner with experience in automation retrofitting pays off.

The cold chain and eCommerce

The growth of eCommerce has a direct impact on the operations of traditional retail stores. As eCommerce orders grow, retail orders shrink. As a consequence, warehouses are seeing more unit picking than ever before. Before deciding on automation, it's critical to consider the changing dynamics of consumer behavior and order profiles overall. These trends have been growing for a long time, but COVID-19 may have deepened consumer reliance on online shopping. Navigating this question could be the key difference in making a smart technology investment for the future.

Examining the costs of automation

The costs of warehouse automation vary widely depending on the size of the business. But, while evaluating automation, costs should be viewed in five parameters:

- Land: Manual processes can't accommodate tall shelving. Automation can help businesses save money on property costs by building up rather than out.
- Construction: If you already purchased the land or are retrofitting, this will be the largest expense. How much steel do you need? Do you have existing materials such as racks that need to be considered in the costs of your automation?
- Labour: This is where automation creates cost savings over time. How much productivity does automation need to provide over five years to show positive ROI? Answering this question is key to determining the viability of automation for your facility.
- Equipment: Which MHE is best for your operations? How will it fit with existing systems?What software needs to support and

integrate with your MHE? Building the right tech stack takes into account all the factors above, and will be the determining factor in the success of your strategy.

- IT: How are you supporting your automation systems? Do you need dedicated resources to manage the new technology?

Why invest in automation?

If it's the right fit, automation offers key benefits that can reduce costs, improve material flow, increase accuracy, and streamline your operations.

Throughput: As we mentioned earlier, automation is built for velocity. If your business moves a lot of inventory, automation is a great way to churn the orders. Also, automation scales well. Typically, these systems are designed for high throughput based on your operation's peak averages. So, barring a tidal wave of volume that overwhelms your resources, your systems will be built to manage unexpected peaks. No need to scramble to hire temporary workers or add extra shifts — automation will be ready.

Traceability: End-to-end visibility is key to pleasing customers and meeting regulations in all regions. However, when it comes to food and pharmaceuticals stored in freezers, the spotlight on foul and lost product is brighter. While traceability is possible with manual operations, it's more prone to blind spots or errors in your records.

Labour costs: Over time, labor costs exceed the investments businesses make in automation. A slow drip can eventully dry a business out. Sometimes, it's better to invest upfront, while competitors play the labor recruitment and retention game. This mindset also applies to warehouse robotics, but the applications are different.

Choosing an automation partner

When it comes to implementing automation, choosing the right vendor is key. The right partner will devote the time and resources to look closely at the unique requirements of each business to provide a personalized solution. To ensure they're choosing the right vendor, businesses should make sure that their partnership checks off a few important boxes.

Portfolio: The more systems integrated, the easier it is to manage your tech stack and optimize your environment for maximum effect. Integrating disparate systems is often complex, and can lead to issues down the road. Also, reducing your number of partners makes it easier to manage your relationships, allowing you to focus on actual work.

Implementation windows: Many cold storage facilities run 24/7. Can your partner work on the weekends? Over holidays? How will they minimize disruption to your business while building your automation systems?

Availability: Is your partner able to start within an acceptable window for your needs? Does it have a presence in the regions where you're operating in order to be on-site for quick consultations and hands-on work?

A true partnership: Can your vendor not just implement, but offer key insights to help you build the best automation system and enhance overall cold chain operations?

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