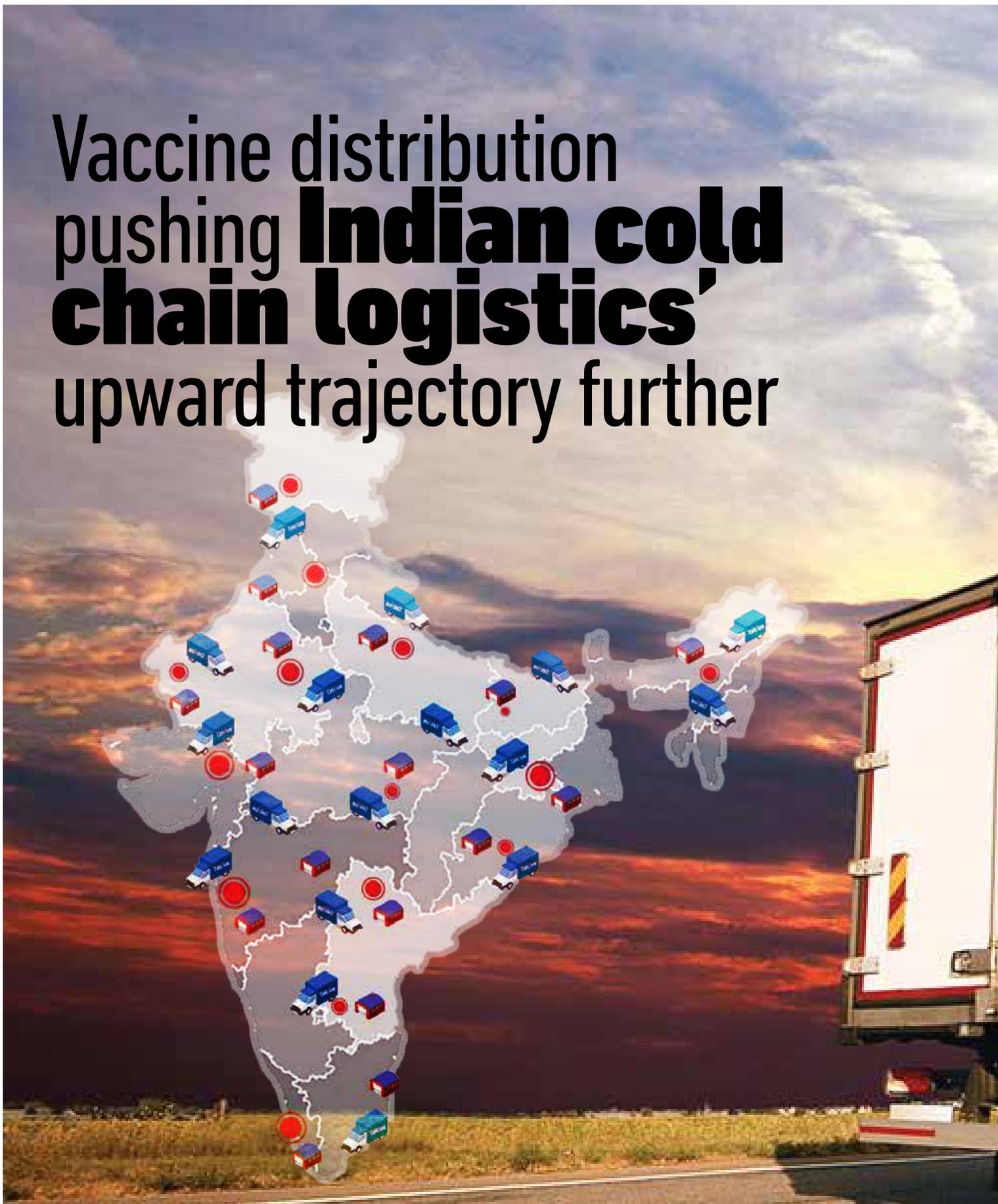


Vaccine distribution pushing **Indian cold chain logistics** upward trajectory further



The world's largest COVID-19 vaccination drive underway in India has put Indian cold chain companies and the pharmaceutical sector under enormous pressure of producing, stocking and transporting the vaccines in bulk in order to meet the high demand. In a fragmented market like India, vaccine distribution calls for robust supply chain logistics and a temperature-controlled environment that supports the life of the vaccines effectively during transit to the remotest corners of the country. It has required expansion of India's existing cold chain capacity in a rapid and spontaneous manner, especially across some of the more densely populated parts of the country, where such infrastructure is severely limited. At present, efforts are ongoing to address the gaps in India's cold chain distribution network, which the government authorities and private sector have highlighted and are fully committed to resolve. Ritika Arora Bhola reports...



India's vaccination drive will require minimum 100,000 fridges and 11,500 refrigerated trucks to meet the target, according to reports. To accomplish this daunting task, Indian cold chain companies as well as the logistics sector seems to be fully geared up to take on the challenges and deliver vaccines 'just-in-time'.

"It was being predicted that the huge surge in demand for COVID-19 vaccines will put pressure on the Indian cold chain logistics industry. "Many said that the industry, in its current state, may crash under the pressure. But to everyone's surprise the Indian cold chain industry effectively rose against the challenge," says **Tushar Jani, Group Chairman at Cargo Service Centre (CSC)**—the world's largest airport-based temperature-controlled facility situated in Mumbai Airport. "Having forecasted the demand for the vaccines, Indian cold chain logistics companies have already planned for the various scenarios and taking measures to increase their storage and transportation capacities."

However, Jani points out two factors which played a vital role in this success.

- Cold storages in India can technically maintain temperatures of 2°C onwards. Most of the COVID-19 vaccines need to be stored at approximately 2 to 8°C and this has tremen-

dously increased the storage and transportation capacity.

- India's cold chain logistics sector is quite developed due to the fact that the Indian government is a part of the Universal Immunisation Program (UIP) which targets 26 million newborns and 30 million pregnant women every year. UIP runs on the back of 27,000 functional cold chain points and over 76,000 cold chain equipment.

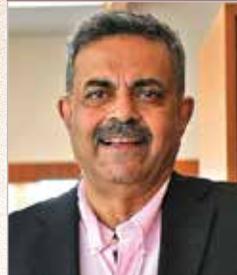
While we are equipped to handle the requirement, the ball game changes when it comes to mass inoculation. The Indian cold chain industry simply needs to develop on the current infrastructure and capacity, enough to satisfy the demand each year.

CSC is ready to meet the requirements with doubling of storage capacity, says Jani. "We had improved infrastructure much before COVID-19 pandemic. This is

The Indian cold chain industry simply needs to develop on the current infrastructure and capacity, enough to satisfy the demand each year. CSC is ready to meet the requirements with doubling of storage capacity.

Being tech-driven is the only way to keep up with the industry's progress. But we need to keep in mind that the whole industry relies on efficient and cost-effective operating methods as a success measure. This industry needs to learn from the best across the world and adapt it to the Indian conditions. Deeper network, robust infrastructure and of course, latest technology will ensure smooth, efficient and resilient supply chain operations for cold chain products.

TUSHAR JANI
Group Chairman, Cargo Service Centre (CSC)



our advantage." Mumbai Airport cargo terminal has the largest airport-based export pharma facility. With storage capacity of three 747 Boeing cargo freighter ULDs which is equivalent to more than 300 tonnes at full capacity, the facility can process up to 25,000 tonnes of pharma cargo per month. The entire facility is temperature-mapped and monitored electronically through mobile app TURANT - CSC, providing real-time temperature information of shipments in the facility."

"While I agree that the industry is facing short-term challenges due to COVID-19-led demands, I am hopeful that as industry we will work out new ways to overcome the prevailing challenges," states Jani.

Blue Dart had also ramped up its cold chain logistics infrastructure much before the pandemic and ensuring the vaccine distribution drive runs seamlessly without any hurdles.

"Blue Dart has the operational experience and specialised infrastructure required for handling bio-medical shipments. This is further backed up by our fleet of six 757-200 Boeing freighters, extensive ground network, and highly skilled team members," says **Ketan Kulkarni, CMO & Head- Business Development at Blue Dart**. "With our temperature-controlled logistics (TCL) solutions, we have the capability to deliver excellence to 9000 pin codes within 24 hours and 12000 pin codes within 72 hours. Our TCL solutions present a se-



Blue Dart boasts Pharma Grade Conditioning Rooms at strategic locations—Mumbai, Chennai, Hyderabad, Ahmedabad, Pune, Kolkata, Delhi and Bangalore. These rooms are at close proximity to Blue Dart Aviation Stations which reduces the turnaround time and aids in speedy delivery. This ensures quick and effective logistics solution for the delivery of essential products that require speedy administration, a quality that is prioritised for temperature sensitive shipments.



KETAN KULKARNI
CMO & Head-Business
Development, Blue Dart

cure and validated supply chain for all temperature sensitive needs. This innovative solution ensures safe and compliant transport in frozen, chilled and ambient conditions. Using appropriate cooling mediums, the packaging performance delivers temperature for the range - 20°C, 2°C - 8°C and 15°C - 25°C for varying distribution times.”

“Additionally, as part of the DPDHL Group, we have access to a number of additional assets such as reefer vehicles, cold storage trucks as well as a global network spanning across 220 countries and territories worldwide,” Kulkarni informs.

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“This ensures quick and effective logistics solution for the delivery of essential products that require speedy administration, a quality that is prioritised for temperature sensitive shipments,” adds Kulkarni.

In India, currently, small volumes of vaccines are being moved and dispatched through air. In general, refrigerated vehicles are being used to move bulk volumes. “As a nation, we are well-equipped to manage this mammoth of a task,” says **G Gopi, Regional Business**

Managers, South, Snowman Logistics. “Today, India is exporting vaccines to most countries. Task forces such as National Expert Group of Vaccine Administration for COVID-19 (NEG VAC) are spearheading the distribution process while supply chain tracking is enabled through the Co-WIN platform,” he adds.

Apparently, world-class cold chain infrastructure, availability of reefer trucks and trained workforce are major subjects of concern for logistics service providers at the moment. Kool-ex with a fleet of over 350 reefer trucks is leading the drive for distribution of vaccines across India—from manufacturers to government depots, PSUs, hospitals and corporates. Addressing the availability of reefer trucks, **Rahul Agarwal, Director, Kool-ex Cold Chain** says, “With a fleet of vehicles of varying sizes— 10FT, 14FT, 24FT and 32FT and a set-up of 10 pharma compliant cold rooms across India, we are managing the distribution of vaccines pan-India.”

Currently, Agarwal

says, Kool-Ex is delivering in up to 40 hospitals in one day and not facing any challenges whatsoever from any agency, or even when trucks are en-route. “In fact, people give us priority and right-of-way when they see vaccine trucks and this definitely helps speed up the distribution process.”

“Kool-ex also has a very seasoned and experienced team. Every team member is motivated by the fact that this is a service to humanity and they are putting in efforts to ensure trouble free smooth operations,” Agarwal adds.

Carrier Transicold refrigeration solutions is also doubling down on its efforts to maintain a seamless cold chain—from vaccine production centres to distribution points in tier II and III cities and towns with a complete line of equipment and services for refrigerated storage and transport. **Pankaj Mehta, Managing Director, Carrier Transicold India and South Asia**, asserts that the company’s refrigeration transport solutions have aided interstate and local vaccine distribution across India.

“In India, the number of vehicles available for pharmaceutical vaccine delivery is close to 11,000. The industry lacks the number of vehicles required to effectively create a network that would reach every corner of India,” points **Swarup Bose, Founder and CEO, Celcius**— which he says is effectively training a network of tier II and III city transporters that have lesser vehicles and also lack IoT-powered devices and the infra-

Blue Dart had ramped up its cold chain logistics infrastructure much before the pandemic and ensuring the vaccine distribution drive runs seamlessly without any hurdles.



structure required for the ongoing vaccine delivery drive. "We have also onboarded many cold storage facilities that were not pharma compatible earlier. However, after going through the GDP guidelines, the number of touch points for the cold storage facilities are increasing."

With all that said, the challenge that still looms large is shipments not reaching remote towns and villages in the desired conditions. "Investment and creation of an immovable infrastructure cannot be done keeping a very specific application in mind. We need to think 10 years ahead about our requirement and challenges against new viruses and bio-threats to create a robust and sustainable infrastructure," says **Sanjay Sharma, Vice President, Coldman Logistics**. "Time and again, I had been raising the point that up to -20°C existing infrastructure needs no upgradation at the manufacturing location or primary distribution centres in metros and large cities. Our biggest challenge today is to reach remote towns and villages where there is a huge gap leading to high wastages."

"Pharma handling is not just about infrastructure alone, specialised skill set to handle the complex inventory man-

agement is required to ensure integrity of the temperature until administration. We are fortunate that the technology required to meet compliance until last-mile is available within our system and can be scaled up fast."

sector. Of this, less than 0.1 per cent, which means less than 100 cold storages can be used to preserve vaccines. "Each vaccine storage facility needs to acquire a WHO-GDP certificate, 21 CFR data loggers, utmost cleanliness and an isolated chamber. Transportation is just one aspect of the chain and another crucial part of the vaccine journey is storing it. One cannot afford the slightest tampering in any stage. That said, manufacturing, storing, transporting and delivering are equally important and something that we take utmost care of," says **Gubba Kiran, CEO and Director, Gubba Cold Storage**.

According to Gopi, as part of their partnership with Dr Reddy's Laboratories for the distribution of Sputnik V vaccine, we

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SANJAY SHARMA
Vice President, Coldman Logistics



just the state distribution, but the whole of the regional requirements. IOT based temperature monitoring system is followed and the temperature, throughout, will be maintained between -2° to -25°C," Gopi informs.

Coldman's infrastructure is at par with global standards that provide real-time access to products. The company have been focussing a lot on training and development to ensure that they have long-term technically skilled resources.

Whopping increase in investments

In order to accomplish the daunting task of vaccinating billions, the Indian government has earmarked over ₹35,000 crore towards the cause. Cold chain logistics players say the investment

will give a significant impetus to the sector. In the last few years, the Indian cold chain sector has witnessed growth by 17 per cent, mainly due to increase in demand for cold storage solutions from pharmaceutical and various other segments. The industry has also invested a lot in converting ambient temperature warehouses to temperature-controlled ones while standard fleets of trucks have been converted into temperature-controlled reefer trucks. A considerable portion of the investment has also been dedicated to logistics-related research specifically.

"The ₹35,000 crore budget has been earmarked for the state governments so that they can secure vaccines from private players. This accounts for transport and distribution of the vaccines too. The benefit lies in the fact that with a higher



will be managing delivery of the shipments through five of our high-capacity temperature-controlled warehouses in Mumbai, Delhi-NCR, Kolkata, Chennai, and Bengaluru. "Snowman is offering storage, order processing, shipper packing, and secondary transportation from these locations. The warehouses are strategically located to take care of not

agement is required to ensure integrity of the temperature until administration. We are fortunate that the technology required to meet compliance until last-mile is available within our system and can be scaled up fast."

Gubba Cold Storage has an estimated 10,000 cold facilities, but less than 5 per cent of them serve the organised

budget, leveraging technology and reducing any chance of discrepancies, improved services can be made available to the Indian population thereby increasing the efficiency of the entire vaccine distribution drive," says Kulkarni.

"Cold chain logistics is said to grow at a CAGR of 17-18 per cent in 2021-22. The growth spurt is further propelled by the initiatives the government has introduced on the logistics side wherein dedicated freight corridors and improving the infrastructure to ensure a streamlined and unfragmented industry will lead to exceptional deliveries that can be achieved in a short period of time. Blue Dart is keen on seeing the effects of these initiatives on our business worldwide," he goes on.

Gubba doesn't take into account government's decision of granting such a huge amount for vaccine distribution. "This has been an inordinate move by the Indian government. We have to read between the lines so as to see what's exactly available in fulfilling the cold chain industry with that budget. The entrepreneurs should also be made aware of such investments so that it rightly goes into enhancing the factor of last-mile delivery."

Sharma agrees. "The cold chain sector does not need this big an allocation to get moving especially for vaccines. Even if we have to create a far reaching and sustainable infrastructure for storage and distribution of vaccines, a few thousand crores on infrastructure shall go well. Though I do not have a detailed bifurcation of this budget but I am sure a large amount would be required for R&D and towards massive production of vaccines rather than their distribution."

Jani says no differently. "These changes will stand the test of time and provide for a benchmark. The growth is here to stay and companies need to provide solutions for the far future. Our industry cannot afford this short sightedness and needs to invest wisely. At CSC India, we have planned to adapt ourselves for long term solutions instead of simply satisfying the sudden surge."

Despite the shortcomings, sector players commend government initiatives and say that it has bolstered growth. For instance, Bose says "Approvals are happening at a much faster pace than before and cold chain entities

are getting priority over other sectors. Subsidies have also helped a lot during this stage of growth. Transporters that underwent loss during lockdown last year are coming on-board with renewed vigour as they look forward to being part of the largest vaccination drive in the world."

"The cold chain logistics industry has been transporting vaccines for ra-



With a fleet of vehicles of varying sizes—10FT, 14FT, 24FT and 32FT and a set-up of 10 pharma compliant cold rooms across India, we are managing the distribution of vaccines pan-India. Currently, Kool-Ex is delivering in up to 40 hospitals in one day and not facing any challenges whatsoever from any agency, or even when trucks are en-route. Every team member is motivated by the fact that this is a service to humanity and they are putting in efforts to ensure trouble free smooth operations.

RAHUL AGARWAL
Director, Kool-ex Cold Chain



Kool-ex with a fleet of over 350 reefer trucks is leading the drive for distribution of vaccines across India—from manufacturers to government depots, PSUs, hospitals and corporates.

bies, hepatitis, and other medicines that need a temperature-controlled environment for years. The COVID-19 vaccine is just an addition. However, given the volume of the order, the impact of this has a positive effect on the cold chain industry," feels Gopi. "Industry players are working on infrastructure upgrades like—fixed cold warehousing, portable cold storage, and reefer trucks to ensure the seamless movement of medicines across India without any temperature excursions. Cold chain companies have started investing on upgrading their quality standards, GDP compliances and fulfilling statutory requirements like drug licenses."

"Altogether, this will give the Indian market significant growth. There will be strong demand for organised pharma cold chain facilities in the com-

ing years," Gopi says.

The major hurdles and emerging opportunities

India began the world's largest vaccination drive on January 16. Conducting it efficiently and smoothly is definitely not an easy task—considering the country's economic situation, huge population and complex market scenarios. Reaching out to the population in the remotest areas and villages is a herculean task and involves assessing the situation, considering alternatives and taking action. Addressing the operational and supply chain challenges should be a priority right now. Other major causes of concern or gaps include lack of ownership or accountability due to fragmen-

tation of the industry and inconsistent operating standard.

Experts say the healthcare industry has been suddenly pushed to become flexible and extremely adaptive in nature. And at present, it is all about efficiently supplying vaccines and medicines across geographies. Therefore, logistics companies need to quickly pull up the socks and deliver efficiently on what is expected. Investing in robust infrastructure and latest technology and efforts to make supply chain leaner is the only answer to these challenges.

“Major cold chain logistics companies have tied up with hyperlocal service providers and this has improved connectivity for the former, while local partners get a taste of the technology and systems at play in the industry. This situation is a win-win for everyone,” says Jani. “The role of the temperature-controlled supply chain is to ensure effective vaccine and medicine storage, handling and stock management. If the logistics operations are managed well, it will help save on costs and ensure a well-balanced output of efficient and quality service.”

According to Sharma, the major gap is the industry’s inability to reach the last-mile while ensuring temperature integrity. “The thrust should be more on

passive cold chain solutions and creating storage capacities at the district level to hold all temperature ranges from -7° to +20°C, and then service through passive boxes,” he says.

Addressing the same, Bose says that the bottleneck has always been about tracking shipments and making sure that the temperature is maintained across the supply chain network.

“With advancements in the Blockchain technology, there have been significant improvements in tracking of consignments right up to their point of use. Phase Change Material (PCM) based technologies have increased last-mile deliveries and reduced wastage at the site of administering vaccines. At Celcius, we ensure that in-transit monitoring systems are installed in every vehicle and the condition of these systems is reported live on our app and website.”

Snowman has been consistent in its efforts to enable seamless last-mile delivery. The company is expanding capabilities of its existing facilities such as the ones located in Mumbai and Krishnapatnam due to high demand and their latest projects at Siliguri and Coimbatore are almost ready. “We are continuously working on improving our services and growing our capabilities to meet the growing demand from the pharma industry. Snowman Logistics has the capability to readily store 650 million doses at any given time, which can be increased to 1.05 billion doses at short notice for pan-India distribution. We have the ability to store at up to -80°C and provide real-time temperature monitoring to ensure the correct conditions

for vaccine distribution during the entire supply chain,” Gopi says.

In addition to that, Gopi says, Snowman has a CAPEX plan of around ₹425 crores

The industry lacks the number of vehicles required to effectively create a network that would reach every corner of India. We are effectively training a network of tier II and III city transporters that have lesser vehicles and also lack IoT-powered devices and the infrastructure required for the ongoing vaccine delivery drive. We have also on-boarded many cold storage facilities that were not pharma compatible earlier.

SWARUP BOSE
Founder and CEO, Celcius



for capacity expansion with a focus on pharma and e-commerce sectors where the company has seen huge demand since the onset of the pandemic, especially as there is a dearth of capacities in the organised sector.

“There is much focus towards R&D of vaccines; equal emphasis should be given to maintaining their efficacy under precise cold chain conditions until vaccine administration,” Mehta notes. “As vaccines are being rolled out from various production facilities, those are also required to be stored and distributed to various cold chain points across the country in the most efficient manner to ramp up the vaccination drive. Vaccine supply chains involve multiple exchanges of hands at various cold chain storage and distribution nodes, creating multiple potential cold chain breaches. With high ambient temperatures common across India, precise temperature control is paramount to maintain cold chain integrity especially for sensitive and valuable cargoes like vaccines and pharmaceuticals.”

Coincidentally, Carrier Transicold’s broad service network is strategically positioned on major national highways and in specific transit locations to ensure prompt service support.

Building a resilient cold chain in turbulent times

To combat the major bottlenecks existing in the current supply chain network, cold chain logistics companies need to



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be flexible, agile and highly efficient. In a world of heightened uncertainty, resilience and agility have never been more important. Each and every life matters and the current task is to vaccinate each and every individual. Emerging technologies and methods will underpin the new era of resiliency.

"A lot of Indian pharmaceutical companies have got orders from other countries for manufacturing vaccines; hence a strong and long-term growth is visible. Alongside, ancillary products growth will also boom. Pharma companies are looking for end-to-end solutions for their business in India. They expect to have the best infrastructure with innovative technology, providing them cost-effective logistics solutions for the

and development to ensure that we have long-term technically skilled resources which can benefit the industry as a whole," Sharma complements Jani's opinion.

"Traceability, accountability, responsibility and a wide network which can provide backup when needed is the need of the hour. We need to connect the supply chain network with

Transportation is just one aspect of the chain and another crucial part of the vaccine journey is storing it. One cannot afford the slightest tampering in any stage. That said, manufacturing, storing, transporting and delivering are equally important and something that we take utmost care of. Gubba Cold Storage has an estimated 10,000 cold facilities, but less than 5 per cent of them serve the organised sector. Of this, less than 0.1 per cent, which means less than 100 cold storages can be used to preserve vaccines.



GUBBA KIRAN
CEO and Director,
Gubba Cold Storage



smooth functioning of their operations/business in India," expresses Gopi.

"I believe that being tech-driven is the only way to keep up with the industry's progress. But we need to keep in mind that the whole industry relies on efficient and cost-effective operating methods as a success measure. This industry needs to learn from the best across the world and adapt it to the Indian conditions. Deeper network, robust infrastructure and of course, latest technology will ensure smooth, efficient and resilient supply chain operations for cold chain products," says Jani.

"Quality infrastructure and transparency has always been the driving principle at Coldman. Our infrastructure is at par with global standards that provide real-time access to products. We have been focussing a lot on training

the cold chain network to ensure utilisation of all the assets available, as India has a shortage of such assets," says Bose. "When shippers, transporters and cold storage entities connect with each other seamlessly and entire offline operations convert to an online model, only then we can ensure that the supply chain is running efficiently. Celcius platform aims at accomplishing this and has been developing software solutions for the same."

Carrier Transicold has also launched several India-specific products and solutions in the segment. The Supra® and Oasis® offerings for large trucks are designed to provide strong, reliable performance in hot, dusty ambient conditions and offer superior pull down and cooling efficiency.

For last-mile distribution using refrigerated small vans, Carrier Transicold

introduced several models of the Citi-max™ series for chilled and frozen applications. The streamlined design has very few serviceable parts helping to reduce repair and maintenance, resulting in low overall operating costs.

"Our carrier equipment offers superior technology and automated solutions—advanced control, remote monitoring, and safety devices. The various cooling, heating and defrost cycles are controlled through an advanced microprocessor-based controller with other features such as sleek design, self-diagnosis, error alarms, and high customisation managed through an easy-to-handle truck dashboard called 'Cab Command' which also checks the health of the machine and signals any alarms, notifying the driver. The same controller enables the driver to run a pre-trip inspection of the refrigeration system to ensure readiness and avoid breakdowns while en-route," explains Mehta.

Additionally, Mehta says, their Lynx™ Fleet solutions also empower customers to remotely monitor and control refrigeration units and help track their consignments with a strict watch over temperature integrity.

Carrier Transicold's Lynx Fleet digital solution, developed in collaboration with Amazon Web Services (AWS) applies advanced IoT, ML and analytics technology to connect the cold chain in the cloud, automate key processes and deliver real-time visibility and insights throughout the cargo's journey.

In order to aggregate refrigerated transport fleets across the country and

Our carrier equipment offers superior technology and automated solutions—advanced control, remote monitoring, and safety devices. The various cooling, heating and defrost cycles are controlled through an advanced microprocessor-based controller with other features such as sleek design, self-diagnosis, error alarms, and high customisation managed through an easy-to-handle truck dashboard called ‘Cab Command’ which also checks the health of the machine and signals any alarms, notifying the driver.



PANKAJ MEHTA
Managing Director, Carrier
Transcold India and South Asia

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G GOPI
Regional Business Manager-
South, Snowman Logistics

offer end-to-end solutions to its customers, Snowman has launched a technology platform called ‘Snowlink’. “With this, we intend to help small truck operators to be part of our organised end-to-end offering. Additionally, last year, we designed solutions catering to small volume locations where there are no cold storages (small towns, taluks, villages) by using refrigerated containers, reach-in freezers, etc. for effective temperature-controlled deliveries,” Gopi informs.

Effective health systems for improved pandemic preparedness

The pandemic has certainly brought healthcare into focus. The crisis has also provided much required recognition to cold chain logistics involving delivery and distribution of pharmaceuticals and perishables. Experts already predict high growth in healthcare cargo volumes in 2021. Due



Snowman has been consistent in its efforts to enable seamless last-mile delivery. The company is expanding capabilities of its existing facilities such as the ones located in Mumbai and Krishnapatnam due to high demand and their latest projects at Siliguri and Coimbatore are almost ready.

services that cater specifically to the healthcare sector. A robust cold chain is imperative to reduce losses and maintain the product quality especially in the life sciences segment. The pandemic has in a way revolutionised the Indian cold chain logistics sector and opened plethora of opportunities to invest and explore.

to increased demand for healthcare logistics, they believe cold chain industry will experience a massive boost in the coming years.

On the bright side, logistics service providers need to keep revisiting their current practices and reinvent ways of doing business. They should keep abreast with the latest technology. These two fundamental tasks will ensure that the future of the industry is clear and bright. Technology has to be integrated with every link in the supply chain to cement trust and speed transactions between business partners as well as consumers who increasingly demand full traceability of the products. **CC**

Well-managed logistics will become the backbone of the industry. The future of cold chain logistics in healthcare lies in designing

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