




<p>Supported By</p> 	<div><p>National Centre for Cold-chain Development</p><h2>Conclave on Refrigerated Transportation</h2><p>7th March, 2013, India Habitat Centre, New Delhi</p></div>	<p>Partnered By</p> 
<p>Bottlenecks to Refrigerated Transportation: Interactive Sessions Air, Sea, Rail and Road: Linking the Cold-chain Perishable, Frozen, Fresh Foods & Pharmaceutical Sectors</p>		

DISCUSSIONS FROM THE NCCD CONCLAVE ON REFRIGERATED TRANSPORTATION

7th March, 2013

Ihc, Delhi

EVENT REGISTRATION FORM

Conclave on Refrigerated Transportation

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A. Company Details

Company Name			
Mailing Address & City			
Phone / Fax Number			
Email Address		WWW	

B. Individual Details (Mandatory)

Name of Individual*				
	Title	Forename	Middle Name	Surname
Date of Birth*			Gender	Male
	DD	/	Month	/
			YYYY	Male / Female
Position in Company			Food choice*	Vegetarian
Phone Number*		@ Email ID*		
Mailing Address				

For each attendee, please use duplicate form

C. Business/Company Details* (Please mark 'X' in left column)

	Cold Storage Company		Logistics/ Rail and /Trucking Company		3PL and other service provider
	Retail Company		Food Producing /Processing Company		Pharmaceutical Company
	Packaging Company		Regulatory / Consulting / Research		Equipment / Hardware Supplier
	IT based company		Investing / PE fund / VC fund / Bank		Student / Others
Type	Proprietorship Firm <input type="checkbox"/>	Private Limited <input type="checkbox"/>	Public Limited <input type="checkbox"/>	PSU <input type="checkbox"/>	
Year formed		Number of Employees		Number of Offices	
				Are you a NCCD Member*	<input type="checkbox"/> <input type="checkbox"/>

Brief Description*

Please describe your interest in reefer transportation - Use additional sheet if necessary

You will be attending conclave as:	Interactive Audience	Length of presentation (mins):	
Name of topic you want to present:			

If presenting, please ensure to fill this line.

Major bottlenecks in faced in temperature controlled transportation (*your opinion*)*

This NCCD conclave is organised for interaction and information from public and private participants on bottlenecks faced if any and suggestions towards enhancing greater participation of industry & increased development of temperature controlled transportation. The targeted sectors are road, rail, air and sea covering all segments of cargo. The event format will be selected presentations from speakers followed by interactive panel discussions. Lunch will be served at the venue. The conclave is being held on 7th March 2013, at India Habitat Centre, in the Gulmohar Hall.

[Click here to view report](#) on the previous conclave, which was held to take industry suggestions on NCCD's Roadmap.



National Centre for Cold-chain Development

Conclave on Refrigerated Transportation

7 March 2013

Gulmohar Hall, India Habitat Centre, New Delhi

‘Bottlenecks and Solutions’ Interaction Structure

Supported by:



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0930 – 1000 hrs	Pre-Registration Check	
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0955 – 1000 hrs	Welcome Address by	Devna Khanna, ICE Cold-chain Initiative
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Lamp Lighting & Inauguration		
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1000 - 1030 hrs	Theme Talk	Mr. Pawanexh Kohli (Chief Advisor to NCCD)
	Theme Address by	Mr. Shailendra Kumar Secretary Government of J&K (Ex-Director NCCD)
	Special Address by	Mr. Sanjay Bandhopadhyay Joint Secretary, Ministry of Road Transport & Highways
	Keynote Address by	Mr. Sanjeev Chopra Joint Secretary, NHM Dept of Agriculture & Cooperation
	Inaugural Address by Chief Guest	Mr. J. P. Meena Joint Secretary, Ministry of Food Processing Industries

1030 – 1115 hrs	Plenary Session	
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Reefer Transportation: India Opportunities & Challenges	Mr. R.S. Bedi Chairman, Task Force on Logistics, PHDCCI
Reefer Transport Support Initiatives	Dr. R. K. Sharma Director NHB
Investment Opportunities & Outlook	Dr. Anupam Srivastava Managing Director, Invest India (FICCI-DIPP)
NCCD Roadmap	Capt Pawanexh Kohli Chief Advisor, NCCD

 Interactive Discussions – Overview of Refrigerated Transportation in India

1115 – 1130 hrs	Tea / Coffee Break	
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1130 – 1240 hrs	Session – II Technology User's Perspectives	
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Opening Remarks by Session Chair	Pawanexh Kohli Chief Advisor, NCCD
Status of Reefer Transportation: Users perspective	Mr. Alok Dubey DGM, Fieldfresh Foods Pvt. Ltd.
Refrigeration on Reefer trucks	Mr. Ashok Mirchandani MD (Asia Pacific), Carrier Transicold India
Technology Innovation for last mile distribution	Dr. Devendra Jain Director & Innovator, Pluss Polymers
Bottlenecks to temperature sensitive Pharma Distribution	Mr. Chetan Kumria Director Supply Chain, Baxter (India) Pvt Ltd.
Roadblocks to Future Demand: Reefer Transport	Mr. Howard J Scott MD, Big Bear Supply Chain Management
Bottlenecks in Body Dimensions: Reefer Transportation	Mr. V.P. Vargheese MD, Surakhsha Transport Systems India Pvt. Ltd.


 Interactive Discussions – User's Perspective Cold-chain Transportation

1240 – 1330 hrs	Lunch Interaction	
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1330 - 1440 hrs	Session – III Logistics Provider's Perspectives	
	Opening Remarks by Session Chair	Dr. R. K. Sharma Director, National Horticulture Board
	Rail based Multi-modal Reefers: growth bottlenecks	Ms. P. Alli Rani CEO FHEL and Director (Fin), Concor.
	Insulation Technology Bottlenecks in Refrigerated Transportation	Mr. K.K. Mitra Vice President, Lloyd Insulations India limited
	Bottlenecks to Rail based Reefers	Mr. Amitabha Chaudhari MD, APL IndiaLinx (NOL Group)
	LSP perspective: Status & Constraints Reefer Transportation	Mr. S.K. Sarkar COO, Crystal Logistics
	Developing designs for Modern reefer logistics	Mr. Siddharth Mishra CEO, HLM India Pvt. Ltd.

 Interactive Discussions – Logistics Service Providers Perspective

1440 – 1500 hrs	Tea / Coffee Break	
1500 – 1620 hrs	Session – IV Technical & Supply Chain Perspectives	
	Opening by Session Chair	Mr. Aman Khanna Associate Director, Ernst & Young
	Developmental Bottlenecks: Supply Chain perspective	Mr. Purvin Patel COO/Business Head, Radha Krishna Food Land
	Road blocks to Food safety and compliance in cold chain.	Mr. B.T. Gorti Saradiro E Service Pvt. Ltd
	Lightweight materials in reefer bodies.	Dr. Cosima Klinger-Paul Managing Director, Lamilux India Pvt. Ltd.
	Bottlenecks for Reverse logistics	Mr. Anil Chopra MD, Field Fresh Vegfru Pvt Ltd
	Impact of Insulation on Reefer Transport	Mr Jag Mohan Gupta Director, APC Polycoat India Pvt. Ltd.

 Interactive Discussions – Supply chain Perspective

Vote of Thanks to Participants & Conclusion of Conclave

1630 - 1730 hrs Open House Interactions - Tea /Coffee

Note to participants: *This interactive conclave is intended as an NCCD outreach programme to document the bottlenecks faced if any and solutions suggested by stakeholders in the refrigerated transport sector. The interactions are an opportunity for stakeholders to express their varied concerns so as to facilitate greater appreciation when planning future policy interventions. Participants are exhorted to keep this prime agenda in mind for the day's deliberations & are reminded not to utilise this as an opening for marketing of services/products.*

Note: This program is final



INAUGURATION SESSION

Mr. Shailender Kumar, Secy J&K and Ex Director NCCD

Mr. Shailender Kumar reinstated the fact that produce needs to move from farm to wholesale to retail and finally to the consumer, where the chain is required to be integrated. While there exists a static storage infrastructure, the absence of transport facilities defeats the purpose.

Refrigerated transportation sector is not given appropriate importance and hasn't flourished at an equal pace. He urged the stakeholders to come up with the bottlenecks faced and make suggestion to NCCD on the probable course of action so that valid recommendations to the Ministry of Agriculture could be put into action.

He made the audience aware that there exists Extensive highways; rural roads and that Agriculture produce available in all parts of the country; these need to be transported to reach the consumer. According to a study by ICAR the perishable losses amount to 1 lakh crores in current value terms. There are twin losses happening- one in terms of monetary loss and the other is the actual loss of produce which a could have helped to bring about nutritional security in the country and promoted exports of fruits and vegetables.

There are only 7000 refer trucks for transporting 20 to 30 million MT of produce manned by unskilled workforce which can lead to further deterioration of the quality of the produce handled. The condition of air and ship cargo is even worst. There are a number of issues like lack of understanding of protocols and standards, taxation concerns, interstate traffic regulations and other issues. The government has offered a number of incentives like schemes of NHM, subsidies, 100% FDI, external commercial borrowing allowed and excise exemption, no service tax applicable and zero custom duty. But the industry participants are still not fully utilizing these benefits – was it due to lack of awareness or other matters.

He also emphasized that while studying the industry we should also keep in mind the number of refrigerators available in each household which is truly the last mile.

Mr. Bandhpadhya, Joint Secy, Ministry of Transport & Highways

He elaborated on the state of affairs of the roads in the country where he highlighted that there exists 5 million Kms of road network in country and 85000 kms of National Highways alone. A number of technological and infrastructural advancements have been made in the last 7-8 years. Routes with high traffic movement have been taken up to facilitate easy movement of cargo and people. National Permit Vehicles have been introduced where tax payment is online. RFID enabled vehicles is the next major step taken by the ministry to address the issue of long queues on toll plazas.

He also told that a system for common taxes is under process and would be made available by April end with all the payments made online.

He requested the stakeholders to come up with a wish list which can be taken up by the Ministry to resolve the bottlenecks.

Mr. Sanjeev Chopra, Joint Secy, Ministry of Agriculture

Mr. Chopra highlighted that fact that the mood and development in the cold-chain is very positive, especially as the nation has moved beyond basic grains in agriculture to the high value fruits and vegetables. He said that we are close to attaining a higher level of food security and the nation is now looking ahead to high value produce like fruits, vegetables and exotics. He also said that there are two ways of looking at the cold-chain sector, wherein it is stated that there is 50% capacity available: one that the sector is slow to develop and the other is that this 50% capacity has been built in the last 7-8 years which is a very positive indicator and a commendable accomplishment.

Referring to the fellow representatives from Ministry of Agriculture, Food Processing and Transport, he said that no ministry can individually direct to handle the bottlenecks faced by the refrigerated transport sector. He stated that 7000 refer trucks is like a small minidrop in the ocean. He suggested that the aim of the conference is to determine the additional support needed for this important cold-chain link and that this important transport sector needs to catching up with the growth in storage capacity.

He highlighted to the audience that the government was undertaking a series of progressive reforms, in the APMC act, in extending fiscal support, promoting of institutional links, in knowledge sharing and it was for the industry to understand and help in this national agenda. The future focus is on efficient post-harvest management and this means more partaking from the transportation and storage arms of the cold-chain sector.

He stated that the refrigerated transport is not only related to fruits and vegetables but other segments like dairy, ice-cream, poultry and pharma. He requested the stakeholders from all these sectors to come up with their issues. NCCD having a modern approach is a body which is in a position to address these issues at a much faster pace.

Mr. J. S. Meena, Joint Secy, Ministry of Food Processing & Industries

Mr Meena highlighted that the transportation sector is very vital in controlling the wastage of fruits and vegetables. New mega food parks are being set by the Ministry of Food Processing and Industries, abattoirs are being modernized, new infrastructure has been put in place but the most important connecting link is the transportation sector.

He informed that 63 projects of integrated cold chain with an investment of 1200 crores are in the pipeline and 75 projects of integrated cold chain with an investment of 1500 crores are planned in next two years.

He stated that all these investments would be meaningless if the transport sector is undeveloped. According to him the key challenge is the lack of skilled manpower.

SESSION 1: PLENARY SESSION

Mr R S Bedi, Chairman, Task Force on Logistics, PHDCCI

Indian Cold Chain Industry

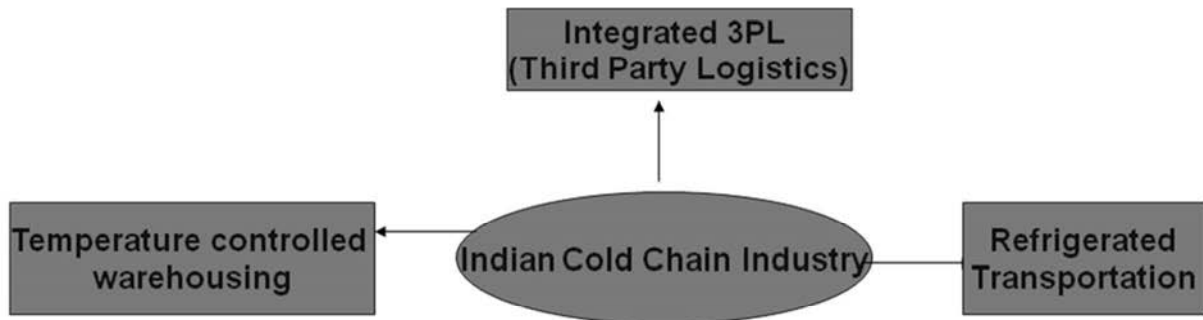
- Majority of the cold chain infrastructure in India was developed in 1960s which majorly supports the storage of potatoes and potato seeds.
- About 75% of the total capacity of cold storages is suitable only for potatoes.
- Cold chain Infrastructure for other temperature sensitive goods is at abysmal state right now.
- On an average, about 30-40% of horticultural produce gets wasted annually in India.
- Even though India is the second largest producer of vegetables worldwide but its share in global export of vegetables is around 1.3% only. This is mainly caused by the lack of cold chain infrastructure which includes both storage and transportation facilities.
- According to recently published report by TechSci Research “India Cold Chain Market Forecast & Opportunities-2017” the cold chain market of India is anticipated to grow at the **compounded annual growth rate (CAGR) of 28% during 2012-2017, which will make it a whopping US\$ 11.6 Billion (Rs. 6,400 Crore) market.**
- The Indian cold chain market is highly fragmented in which about 3500+ players are present and most of them are from unorganized sector.
- India has nearly 23 million MT of cold storage facilities where as it currently needs at least 10 million MT of capacity over and above the existing one.
- Uttar Pradesh, West Bengal and Punjab account for around 70% of the total capacity.
- In the present scenario, India is able to store only 2% of its farm produce in temperature controlled environment as against 8% for the Asia-Pacific and 85% for Europe and North America.

Global Cold Chain Sector

- The total capacity for refrigerated warehouses is estimated at 458 million cbm worldwide, of which 310 million cbm are public warehouses (for hire).
- During the last two years approximately 192 million cbm of additional refrigerated warehouse capacity has been created.
- USA, India and China account for the largest share in cold storage industries worldwide.

3 main segments of Cold Chain Industry

He explained that the industry could be divided into three component sectors. Namely, warehousing, transportation and integrated logistics. The last was of utmost importance to its success as it ensures cohesive and safe handling and assured quality.



Refrigerated Transportation In India

Present Status

- In India, unlike Western Europe or the USA, cold chain distribution or refrigerated transport is still at a nascent stage.
- When compared with the world standards for cargo movement through cold chain, India is way behind.
- The percentage of movement of fruits and vegetables through cold chain in U.S. is around 80 to 85%, Thailand is 30 to 40% while it is negligible in India.
- According to industry estimates, approximately 104 million MT of perishable produce is transported between cities in India each year. Of this, about 100 million MT moves via non-reefer mode and only 4 million MT is transported by reefer.
- Currently, most of the refrigerated transport segment is fragmented with large number of small, non integrated private players focusing on select commodities or regions.
- Their key assets comprise of modified trucks with additional insulated fixed containers and air conditioning units.
- India has about 250 reefer transport operators (mainly private firms) that transport perishable products. Of the estimated 25,000 vehicles in use, 80% transport dairy products, thus leaving only about a fleet of 5000 Vehicles for refrigerated transportation.
- Market studies have revealed that about 40% of the vehicles are for long haul movement while 60% vehicles are for short haul movement.
- Presently, the reefer transportation business in India (Both organised and unorganised segment) is estimated at about Rs 10-12 billion which includes reefer transportation demand for both exports and domestic.
- With regards to volume, the current reefer transportation business for exports is about 2.5 million MTS and for domestic consumption is about 1.5 million MTS.
- Based on the existing production and consumption pattern, the market can be stretched to a potential of 14 million MTs in the next 5 years.
- Major problems that cold chain logistics industry has been facing are power outages, fragmented market, high costs because of long transit time etc.

- Most of the cold chain providers are private players. There are few players that can offer an end-to-end cold chain solutions leading to limited choices for outsourcing by the manufacturers.
- Multi modal transport network for cold chain is lacking. Road transportation accounts for more than 60% movement. Leads to environmental issues.

Opportunities ahead

- Indian Logistics sector has evolved during the past two decades from being a pure transportation service to provision of value added offerings as customs clearance, freight forwarding, cross-docking, reverse logistics, warehousing of modern standards etc. however, it is still characterized by dominance of unorganized market.
- Logistics market represents about 6.2% of the country's GDP with transportation segment being the largest component of the market as most of the industries spend more than half of their logistics cost on this function.
- India is viewed as Asia's most attractive logistics market and ranks at No.4, whereby there is moderate logistics infrastructure in place and companies are starting to adopt integrated logistics practices thus offering more opportunity for growth as compared to an already developed logistics market like Singapore, which ranks at 13(as per SSKI research)
- Pharmaceutical Cold Chain Logistics represents an emerging opportunity in India despite several local challenges...
- Ø **New Drugs:** In addition to the 130 biotechnology drugs and vaccines approved by the US FDA, there are more than 350 biotechnology drug products and vaccines currently in clinical trials. Many of these biotechnology drugs are temperature- sensitive that require cold chain network.
- Ø **Focus on Vaccines:** major shift in the product portfolio of leading pharma companies, with focus on products developed through advanced technology like vaccines, which require maintenance of a proper cold chain right from the manufacturer's premises till it reaches the patients.
- Ø **India's growth as an outsourcing hub** is making MNC's being particular about strict regulatory compliance and costs, thereby increasing the demand for cold chain transport infrastructure

What needs to be Done

Export Logistics

- Special emphasis needs to be laid on development of reefer related infrastructure in view of India's export thrust and potential. Much time has already been lost in this direction. Addl infrastructure could be developed at ICDs at Delhi, Bangalore, Pune, Hyderabad, Guwahati, and ports at JNPT, Madras, Cochin. It is felt that the above mentioned ports and ICDs, and their hinterlands are most suited to exploit the exports of perishable cargo.
- Currently in India there are bottlenecks at most of the Indian Airports that include authorities not being able to assure cold room space despite getting advance notices from the companies about possible unloading of large consignments of temperature sensitive products.

- Cold chain dollies need to be provided at all international airports for movement of temperature sensitive cargo from airport warehouses to the tarmac where aircraft is parked.
- Some of the other gaps include improper training and refresher courses for some of the handling staff who handles such products at the Airport. Storage of Pharmaceutical products along with the meat and food products is against the GMP norms
- There should be emphasis on standardization and procurement to top-of-the-line technology. This should include:
 - Ø A perspective plan to introduce handling and storage systems over a period of time and it should be responsive to the needs like changes in refrigerated containers, etc.
 - Ø Planning of adequate numbers of reefer receptacles to be done in such a way that the ports are able to cater to the large variety of electrical supply variables like voltages, connector types, and interfaces. This would not involve much investment and help in making the refrigerated container service effective and attractive at Indian ports.

Road Transportation and Others

- Main arteries of roads and bridges along the way or which are important for container movement need special attention. There needs to be greater emphasis on design, specifications, quality of construction and maintenance of these roads. This aspect is more important since the refrigerated containers are larger and heavier. Multi-axle trucks (with suitable facilities for under slung diesel generating units) should be planned and encouraged.
- Domestic manufacturing should be encouraged. The domestic reefer market is large and could prove as a catalyst in growth of transport of fruits, vegetables, fish and other horticultural products. The required equipment and technology for insulation, cooling and the basic reefer technology should be obtained from leaders abroad. Import duties on components and equipment should be reduced.
- India's domestic market for refrigerated container services is yet unexploited. Aggressive marketing and making container services available for domestic perishable cargo would help in improving cargo transportation culture in India; also there is an ardent need to spread container culture among the shippers.
- Refrigerated containers need special facilities for testing, calibration, checking, cleaning and servicing. This is a relatively labor intensive service with considerable value added. Moreover, it goes a long way in ensuring long life and high value to the product being transported; hence such facilities should be introduced at the ports and ICDs.
- Greater thrust needs to be provided for development of suitable refrigeration systems including temperature controllers (with vast range and fine tolerances). End-users should also be involved in coordinating with the refrigeration industry of their special requirements.

- Need of Capital investment in Rail support equipment to move reefer containers.
- Provision of fast, scheduled, refrigerated container block-trains, etc should be there.
- The transport industry, shippers and government should create a task force to decide on strategic locations where inland pre-cooling and cold storage facilities could be developed, which are woefully inadequate.
- Promote organized Retailing in India; this would help in encouraging investment in the cold chain sector (Including Reefer Transport).
- A key gap in cold chain space is lack of adequate & relevant human capital to manage and operate the cold chain systems. So focus should be on opening more and more specialized institutes for cold chain technicians where they can avail on job training.
- Technical Standards are not suitable for Indian Transits; Poor cargo handling knowledge or dissemination; No intelligent support mechanism; Irregular parameters across regions; Standard refrigerated systems are inefficient & poorly designed and Lack of connectivity & distribution centres , such issues need to be addressed seriously and in detail to improve the existing scenario of Reefer transportation in India.
- Power shortage in the country (approx.10%, with a peak deficit of 17%) could lead to significant impacts on cold chain sector, which is dependent on electricity for refrigeration. This needs to be addressed.
- Lack of Concrete regulations in Pharma Logistics: Though there are Good manufacturing Practices for the manufactures, packaging and storage of active pharmaceutical ingredients (APIs) and medicinal products, similar principles are not yet established for pharmaceutical logistics segment. These should be put in place
- Despite cold storages having been given infrastructure status and allowed the benefits of Project Imports, ECB funding, Viability Gap funding, tax holidays etc, large investments in the sector are still lacking. Govt needs to look into this. GST implementation needs to be pushed harder : a major factor which would impact the storage locations
- The cold chain sector demands an immediate investment exceeding USD 5 billion for creating additional storage capacity of 30 million tons and improving availability of refrigerated transport. In 5 years we will be needing investments exceeding USD 10 billion per year in this sector.

Dr R K Sharma, Director, NHB

Dr Sharma talked about the reefer transport support initiatives by National Horticulture Board.

Govt. initiatives - Milestones

- High Power Committee Study (1997-99)
- Launch of first scheme (25% subsidy) in 2000
- NHB, NABARD, Commercial Banks, State Govt. involved

- Cold Chain Task Force constituted (3.5.2007)
- Task Force Report (14.8.2008) - Implementation
- Technical Standard Committee constituted (16.6.2009)
- Implementation of Technical Standards starts 1.4.2010
- Creation of National Centre for Cold Chain Development (27.1.2011)

Financial Assistance

- Reefer Van, Trucks, Containers and Specialized Transport Vehicle are eligible as PHM component alone or integrated cold chain projects
- Cost norm Rs 24 lakh/unit of 6 MT capacity; subsidy 40% (Rs. 50 lakh/project) in general area and 55% (Rs 60 lakh/project) in Hilly and Scheduled areas
- Procedure: DPR, LoI, Inspection, Release
- **12th plan proposal:** Cost norm revised Rs 24 to 26 lakh/unit of 6 MT Capacity @ 35% subsidy for general areas and 50% for hilly & scheduled areas

Trends

- Shift towards integrated cold chain. MFPI 94 ICC projects have essential components of reefer van linking farm level infrastructure with retail distribution hubs.
- Modern multi-commodities cold storage (for imported produce) or CA stores have reefer van as desired components.
- Frozen produce stores also linked with reefer van for distribution part.
- Stand above bulk store, basically in general areas, still alone.

Reefer Training- Course items

- Skill Development of Cold Storage Operators
- Training Content approved-Standing Committee (29.06.2011)
- Course Modules: Basics of perishable transport, Refrigerated Transport Practices, Specifications of various components, Pre & Post trip inspections, Field Visit for hands-on-training, Standard operating practices for machinery, Reefer Cargo Losses and how to control them, Carriage Guidelines, Documentation for quality maintenance of produce and Feedback, Safe and Fuel efficient driving – Green Driving and Contingency Management & Feedback and certificate distribution Session.
- Khalasi and driver both to be trained. Crisis management practices also to be part of training.
- These trainings are done with participation of NCCD.

He also depicted the experiments conducted by NHB where the protocols for transporting mangoes were developed to successfully transport mangos from Malihabad, UP to Dubai.

Technical Standards and Protocol for Transportation of Perishable Food Stuff in India (NHB-CS-Type 05-2011)


Basis of Standards

European Standards : (ATP Agreement) Agreement on the international carriage of perishable foodstuffs and on the special equipment to be used for such carriage.

- Prescribed by UNECE United Nations Economic Commission for Europe & Inland Transport Committee of Economic Commission for Europe.
- Established at Geneva on 1Sept.1970 entered into force on 21 Nov.1976. The Agreement and its annexes have been regularly updated.
- Presently there are 41 contracting parties including Europe, the Russian Federation, United States of America and Uzbekistan.

Standard – Contents

- Definitions of Various Equipment
- Testing Procedure
- Measurement & Definitions
- Measurement for Bodybuilder
- Guidelines For Operators
- Transport Temperatures
- Good Loading Practices
- Airflow



National Horticulture Board

Refrigerated Van No.	:	NHB –Class/FRA/FRB/FRC
Temperature Range	:	Plus 20°C to Minus 20°C
Refrigerant Type	:	<input type="text"/>
Cladding Type	:	Food Grade
Air Ventilation	:	Yes/No
ACU	:	Watt
External Power	:	V (3 Phase) etc.
Chasis No.	:	<input type="text"/>
Manufacturing MM/YY	:	<input type="text"/>

Test Facilities – Required

- Government to assists setting test lab(s)
- Government/Industry to appoint authorities for certification/testing
- Body builders and refrigerator manufactures shall make type tests of their products in an ATP test station approved by the competent authority
- Transport equipment owners need ATP certificates “conformity with tested sample” (type test)

Mr. Anupam Srivastava, Invest India

Talked about his organisation’s offerings and asked the stakeholders to invest in the transportation sector. He informed of the interest by Ministry of commerce and Industry and DIPP in the cold-chain sector.

Mr. Pawanexh Kohli, Chief Advisor, NCCD

Mr Kohli referred to each of the eminent players present from the industry, asking them to together make the industry exciting and fulfilling. According to him change can be brought only if there is wholesome participation from all bodies and stakeholders, in not just the tasks but in various innovation and knowledge development aspects. He urged them to come up with specific bottlenecks and targeted recommendations. He reiterated that NCCD is a body of the people and would continue to reach out to the industry for inputs and grass root guidance.

He further introduced NCCD, explaining that while formed as an autonomous body, its aims were:

1. To Provide an enabling environment for cold chain sector to gain prominence and to enroll private sector involvement.
2. To establish standards & protocols for supply chain & equipment in harmony with international standards.
3. To undertake and coordinate R&D work in this sector.
4. Similarly, to undertake and coordinate HRD and capacity building.
5. To provide appropriate policy framework as well as launch publicity campaigns.
6. He added that cold chain is best applied holistically across all segments and NCCD will not focus only for agriculture products (though this segment is known to be main driver worldwide).

Benefits to nation accrue in terms of varied benefits like reduced **wastage**, improved **quality** and enriched **value sharing** across total value chain.

To fulfill the objectives, NCCD has been mandated to function as **the Umbrella body**, as a **national nodal agency** for all cold chain development initiatives.

- There are by-laws that sanction the NCCD to progress with certain activities.
- These by-laws are open to review by the governing council and we will welcome suggestions to amend and improve upon these declarations.
- It includes research & evaluation, promotions, commercial exploitation of technologies, evolve strategies, etc.
- At the start the committees with industry participation, were established.
- The Focus areas span across supply chain, skill development, Energy, Standards, Logistics, Specifications and R&D.
- Each Committee could set up additional task forces comprising of experts.
- As per the recent Dr Saumitra Chaudhari's report, our financial incentives are more capital investment friendly, as opposed to how they can catalyse business that are more revenue expense intensive.

- NCCD shall take lead to explore innovative incentive options to catalyse the flow of business through cold chain.
- Expectations from NCCD were high and need for umbrella body was reinforced by members. Yet, to meet this expectations, clear enunciation of requirements from stakeholders is needed.
- Suitable amendments to the membership rules had been made in include a wider array of industry and knowledge based participation, enhancing the scope of stakeholder members.

The steps taken are collaborative & partnership based, besides those which were only interactive, such as this conference.

- In other steps, NCCD has already commenced processes and hopes to obtain support from GoI and World Bank for funding certain specific cold chain related activities.
- These will include support for participation of IITs in this elite and critical profession. This will add greater credibility to India's cold chain engineers.
- NCCD would also promote specific and specialised trainings through the IITs and for vocational training courses.

Participation was also needed in developing domain knowledge & cargo handling skills for managing cold chain.

In the road map conclave, there was strong demand for a knowledge repository-

- NCCD will arrange and organise access to established knowledge base worldwide and locally,
- We understand that technology application in India may require indigenization to suit our working and infrastructural requirements.

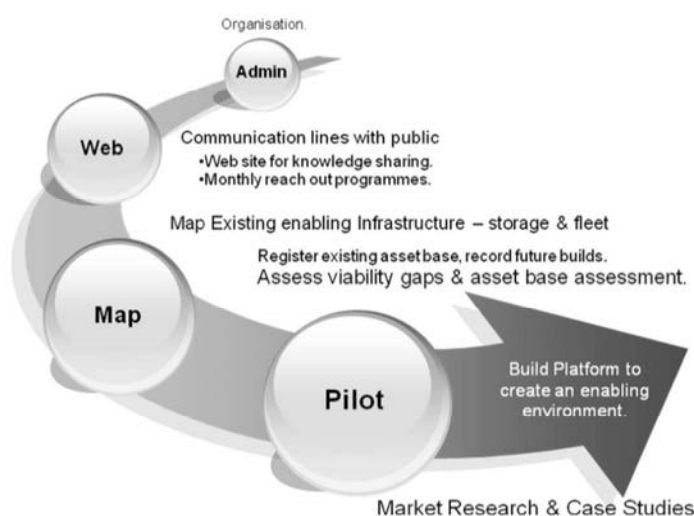
NCCD has already provided various industry and commercial level interactions to the sector ranging from subsidized or free participation in events like IITF (International Expo), Conferences and seminars. Going ahead, NCCD would require more involved participation from industry in its member base, committees and in standards & policy recommendations.



He explained and noted that NCCD is not only for agriculture produce but will develop synergy across all cold chain sectors, in involvement would be through its various members.

He introduced this conclave as the first of focused and targeted sessions, to reach out to industry specifically to receive inputs on growth drivers and facilitation help. He exhorted participants to focus on bottlenecks and not to treat the conclave as a marketing platform.

He reminded that in July, a participative think tank conclave was held to include inputs for a Road Map and shared the road map.



- The next steps that will build a platform that creates an enabling environment under NCCD were displayed.
- The steps include diligent mapping of current asset base, communication mechanism and case studies or market studies.



- The follow up actions would include:

- Pilot projects.
 - A knowledge repository.
 - Collaboration with technology providers.
 - Capacity building.
 - Excellence awards.
 - Testing, validating and setting standards.
- The aim is to provide a forward catalyst to the cold supply chain.

In summarising:

- NCCD will participate as nodal agency in policy formulation for cold chain sector with various ministries and autonomous bodies of the government (such as planning commission, finance, HRD, Transport, technology, etc).
- These activities would be best served with direct inputs from industry.
- NCCD would seek to sponsor R&D activities with public and private R&D units.
- NCCD will bring India's cold chain into universities and international arena.
- NCCD will promote businesses and market studies that can serve as examples for others.
- NCCD aims to promote commerce through India's cold chain.
- The cold chain is said to be fragmented and disorganised. The industry has also stated as much about the government initiatives. That it has too many arms promoting varied schemes & policies. NCCD is the government's forward step to address these concerns. NCCD shall be the one stop agency to forward the industry needs and relate them to national agenda. This will be done through internal and external collaborations.
- It is also recognised that Cold chain is not solely about building infrastructure but actually is the utilization of a supply line that serves to link perishables from production point to buying market.
- NCCD will bring focus on this aspect of cold chain as well as packaging and other cold chain specific processes.

In ending he welcomed the continuous inputs and intelligent revisions to road map and invited members to take advantage of and to support NCCD in taking India's cold chain forward.

SESSION II: User & Industry Perspective

Mr Alok Dubey, DGM, Fieldfresh Foods

He highlighted the issues faced by the transport sector as following:

- § **Mis-Match** between availability & provision of vehicles.
- § **No standardization in sizes** of vehicles between various service provider.
- § **Limited number Quality service providers** (Less number of reefer vehicles vs. requirement).
- § **Bad Road Conditions**, resulting in High wear & tear & asset depreciation.
- § **Poor Network**, No Single Service Provider is able to give Pan India service.

Market & Concentration

- § **Fragmented** Cold chain operational presence (Extreme North-Apple, South & South west-Pharmaceutical).
- § **Reverse Logistics**: Major movement of cold chain is from North-West-South-west routes, and very limited towards East. Any deviation from this main route is expensive affair for growth.
- § **Design**: Only few refrigerated van have AC plug-in facility to ensure back-up in case of generators breaks down. Almost none for part load uses.
- § **Development**: Limited number of Fabricators (Available Reefer Truck Manufactures).

Knowledge / Awareness

- § **Domain**: Cold chain operators have limited knowledge of industry requirements.
- § **Drivers**: Lack of knowledge amongst driver makes them immune to cold chain criticality.
- § **Management**: Lack of skilled staff at Service Provider's end with no skill upgradation or cargo specific training.
- § **Stoppage**: Frequent delay and stoppage at highways & toll points, harsh for perishables.

Wish List

- To have **plug-in Power Points** available at petrol Pump in case of emergencies.
- **Separate lane** for reefer vehicle at Toll gates.
- Approved **Standard Sizes** of refrigerated vehicles for different pay loads.
- Vehicle **designed for Part Load** requirements.
- **Cargo handling training** for operational staff.
- Better facility should be available at Airports for Export Cargo.
- Thermal Blanket should be used in transit of cargo from Perishable center to Aircraft.
- Mumbai Airport Perishable cargo center needed an immediate upgradation.
- No Permanent Perishable center at Bangalore Airport
- Cargo to be taken out from Perishable center D-1

He stated that the demand is huge but no service providers are available to meet that demand and emphasized on manufacturing standard containers.

Mr Ashok Mirchandani, MD (Asia Pacific), Carrier

Stating the importance of transportation sector he stated that Carrier has been in the field of manufacturing trucks and the major challenges include:

1. Indian Cold Chain Development

2. Seasonal / Fragmented Loads
3. Capital Cost- duty structure - financing options
4. Sales Tax structure-check posts
5. Lack of reverse loads
6. Undefined end usage of components imported in the country due to which there are huge duties to be paid

What will change in India :

1. Demographics
2. Ministry initiatives : all the ministries are putting in efforts to control the losses and the developemnt of the sector
3. Organised retail : FDI in multi brand retail is a big incentive
4. Streamlined logistics
5. Integrated solutions : there should be manufacturers and service providers who take up the role of providing integrated products so that

He also stated that as a general belief all the developed countries should have 1500 refer trucks per million of population and according to the study the figures for the countries as follows :

- Middle East : 300
- Latin America : 100-150
- China : 20
- India : 5

Which implies that we have a lot of scope to develop.

Dr. Devendra Jain, Director and Innovator, Pluss Polymers

Technology Innovation for Reefer Trucks and Last mile distribution Bottlenecks in cold chain. The bottlenecks can be listed as under:

1. **Energy:** Energy expenses constitute 30% of the total expenses
2. **Product Temperature**
Different Products require different temperature conditions and the Capacity utilization in Indian cold chain sector 30 – 75 %
3. **Last Mile Distribution**
 - Limitations in last mile distribution
 - Roads for access are limited in reach and quality.
 - Fragmented cold storage means limited source points and longer travel times.
 - Small volumes reduces capacity utilization and business participation.
 - Vaccines, cold foods less in tier 3-4 regions (30% un-penetrated market)
4. **Technology**
 - Technologies Available, but dissemination and adoption limited.

- Phase Change Material can be used to counter some of the bottlenecks-
 - Limiting Pollution: Noise and emissions. This is because no on site active cooling technology is required.
 - Freeing Capacity: improving payload. This is because the passive cooling PCM forms part of the structure and does not require broken space for air flow inside reefer trucks.
 - Timed redundancy: Thermal Inertia. The PCM can be designed to store thermal energy for predefined periods, which makes risk assessment and mitigation a part of planning.
 - Risk Minimised: Chill injury mitigated. PCM are cooled to within the required temperature parameters. There is limited risk of extreme cool contact with product causing chill damage.
 - Portability – PCM allows to sustain the integrity of cold-chain even under small capacity usage and hence ensures a more risk averse last mile delivery mechanism.

5. Support and focus

- These technologies are in use in other industries including temperature control in telecom, clothing and green building. Yet in cold-chain the awareness is negligible. The government should seek out innovative solutions, especially those that can affect India specific needs and create policies and awareness campaigns to promote these.

Mr Aman Rekhi, Baxter India

Bottlenecks to Pharma Cold Chain

Cold Chain Logistics consist of :

- Cold Storages
- Refrigerated Carriers
- Cold Chain Packaging
- Warehousing processes
- MIS (tracking and tractability)

Major Focus by government is towards:

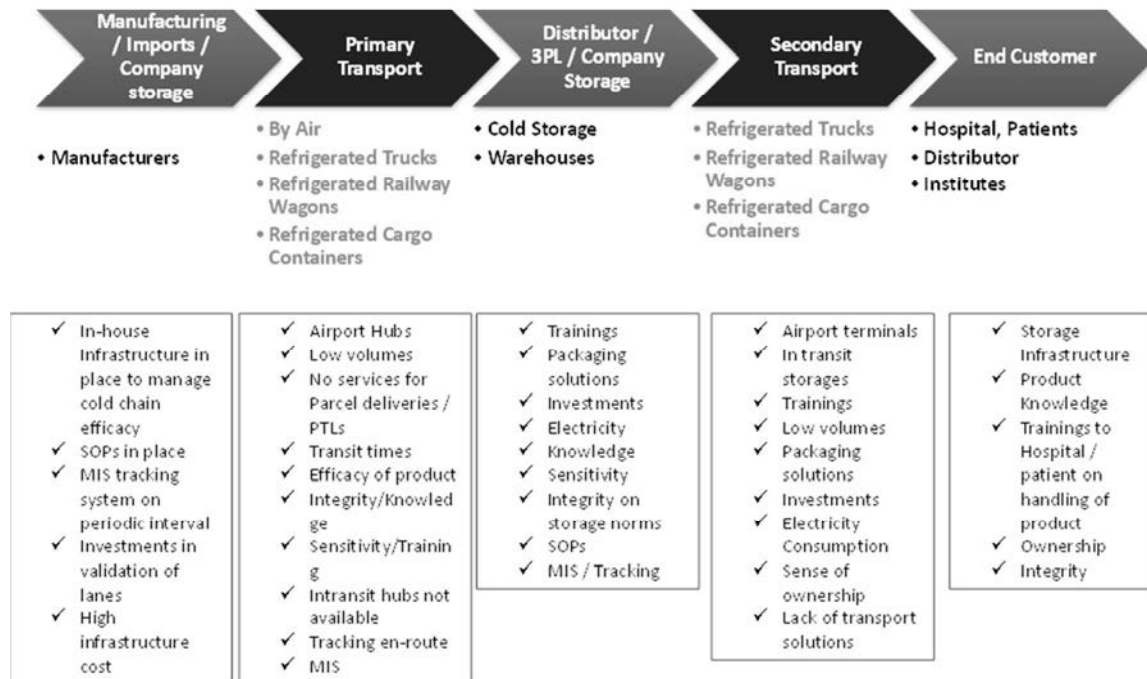
Fruit and Vegetables, Chocolates, Ice Cream, Dairy Products, Meat, Poultry & Fish with limited space for Pharmaceuticals

Key Bottlenecks

- Cold chain logistics infrastructure

Key Bottlenecks

Cold chain logistics infrastructure



Approach to Collaborative Partnership

- Innovate new Packaging solutions
 - Re-useable
 - Load efficiency
 - Cost effective
- Develop new logistics solutions
 - To manage small loads by road
 - Improvement of services by Train
 - Movement of parcel through air
 - Cut down transit lead time
- Product Sensitivity (Knowledge)
 - Change management : Compliance / integrity
 - Product Sensitivity
- Training
 - Partner with Transporters / Storage warehouses
 - Develop training manuals
 - Handling of products
 - Dedicated skill set

Value Parameters

- Reach (Geographical coverage)
- Temperature Range Availability (Product Ranges Covered)
- End to End Solutions (Integrated approach)
- Temperature & Humidity Control (During Transit)

- Transport Modes
- Product Security
- Cost effective solution
- Competence of service provider
- Regulatory Compliances
- Carbon Footprint

Mr Howard Scott, MD, Big Bear Supply Chain Management

He emphasized that the major constraint or bottleneck apart from all the ones mentioned is the availability of manpower. He told that the current salary per month of the drivers range in the following categories:

- Low end Drivers: 6500 INR per month
- Mid way Driver: 8000 INR per month
- High end Driver: 12-15000 INR per month

Calculating the total worth of a single truck on the road with all the contents is somewhere around 1 Crore and can in no way compared to the 6500 INR being paid to the person who carries it from say Delhi to Mumbai. According to him focus should be on

- Driver training
- Driver best practices
- Driver Health

The industry has somewhere around 33 million drivers at present and would require 51 million drivers by the end of 2015.

He also told that the rate of efficacy of transporting vaccines from Hyderabad to Guwahati is 30% where as for the same values and distances it is 100% in Europe. According to him the best technology is present in the west but it cannot be simply picked and dropped in India, it has to adopted and acclimatized to the Indian conditions.

Mr. V P Vargheese, MD, Surakhsha Transport Systems

Refrigerated Trucks: Industry Overview

- Refrigerated Trucks for transportation of perishables in India has been in use since early 80's.
- The Refrigerated Trucks manufacturing activities are mostly in the un-organized sector and centered in the metros.
- The First Refrigerated Container built on a Truck Chassis was exhibited in the Telco Pavilion at Auto Expo 1989.
- The growth of Indian Refrigerated Industry has been very sluggish in the past 20 years.
- Although reliable data on the average annual production is not available, it could be presumed that this volume would not have been more than 3000Nos. per annum.

- Insulated Trucks (without Reefer Plants) are mostly used for transportation of Fresh fish with crushed ice and Milk & Milk Products.
- The building of Insulated Trucks are mostly concentrated near the coastal towns and nearer to the traditional fishing harbours.
- Traditionally GI Sheets/Aluminium/Wood/Mild Steel are the materials used for Body Construction.
- The Insulation materials used are Expanded Polystyrene (Thermocol), Glass wool, Cork and Wood and Plywood.
- Refrigerated Truck Industry has seen rapid growth in the recent years with more volumes being built.
- The estimated volume of heavy & medium size Reefer Trucks built over the past few years has doubled or even trebled and quality Reefer Trucks are in demand.
- The financial benefits offered by the Govt. in the form of concessional excise duty , is yet to reach the actual users.

Constraints & Bottlenecks in Reefer Truck building

Central Motor Vehicles Rules 1989 - Related

- Refrigerated Trucks have a peculiar requirement of accommodating the Reefer Units above the cabin. Traditionally Cabins are of fixed type and locally fabricated and hence flexibility existed.
- Now all the Chassis manufacturers have launched factory built tilting cabins and it needs more vertical space for cabin tilting.
- The Overall height specified in the CMVR 1989 is based on the types of commercial vehicles available at that point of time. The technology changes taken place in the past 25years needs to be factored and rules amended suitably.
- Multi Axle rigid body trucks replaced the single rear axle trucks as the popular transport vehicle for the long & medium haulage requirements
- The height of the Chassis longitudinal frame from the ground in unladen condition in Single rear axle and Multi Rear axle trucks are shown in the table below:-

Chassis	Frame Height from GL
LPT 1613 (TATA)	945mm
LPT 2518 (TATA)	1070mm

- Additionally the multi rear axle vehicle has a bell crank mechanism at the rear and as such the Reefer Container needs to be mounted above this mechanism. (Height of the Mechanism -150mm)
- The Overall height of various types commercial vehicles would have been decided based on the Height of ISO series 1 Freight Containers and the Chassis height of Rigid body trucks and trailers.

- The Table below gives the External Dimensions of ISO series 1 Freight Containers used in the International Trade.

Container Size	External Width	External Height
20ft x 8ft x 8.5ft	2438mm	2591mm
40ft x 8ft x 8.5ft	2438mm	2591mm
40ft x 8ft x 9.5ft (Hi Cube)	2438mm	2896mm

- The Table below gives the maximum height permitted for motor vehicles as per Rule 93, Clause No.4 of the CMVR 1989.

Description	Max. Height
Motor vehicles other than double decked vehicles	3.80 M
ii. Double Decked Motor Vehicles	4.75 M
Laden Trailers Carrying ISO series 1 Freight Containers	4.20 M

- Considering the peculiar construction of Reefer Containers on Multi Axle trucks and also the height of ISO Containers, the CMVR Rules require amendment as under

Description	Max. Height
Single Rear Axle Motor vehicles other than double decked vehicles	3.80 M
ii. Multi Rear Axle Motor vehicles other than double decked vehicles	4.00 M
ii. Double Decked Motor Vehicles	4.75 M
Laden Trailers Carrying ISO series 1 Freight Containers	4.20 M

Insulated Trucks

- Insulated Trucks are also part of the Cold Chain in India and these trucks are used for transportation of Chilled Products.
- These trucks are mostly used for transportation of Fresh fish with Ice (2 to 3 °C) & Chilled Milk & Milk Products (3 to 4 °C) and similar products.
- The volume of Insulated Trucks built in India per annum is quite substantial and even more than the Refrigerated Trucks
- Since insulated trucks play a vital role in the cold chain, these trucks also to be treated at par with Refrigerated trucks.
- “Refrigerated Motor Vehicles” and “Insulated Motor Vehicles” to be brought under the same tariff head and treated equally.

SESSION III: Provider Perspective

Ms P Alli Rani, CEO, FHEL

She talked about the achievements of Concor stating that CONCOR operates 63 terminals; is coming up with 10 logistic parks; runs 2 full trains in a week and is equipped to handle any demand from the point of view of the service provider and does not face any challenge. The major business comes from the EXIM sector, meat, pharma and only limited amount of Fruits and vegetables.

Coming to the constraints from the point of view of the customer there exist a number of issues which can be divided as follows:

- **Demand side constraints**
- Single direction of traffic with no balanced movement
- Issues of scale where small size of consignments cant be shipped and are not cost effective
- **Supply side constraints**
- Lack of availability of adaptable technology which can be adopted to the nature of the produce to be transported
- Lack of Presence of single window service provider offering a package of services

Also the aim should be to benefit the farmers at large.

Mr. K.K. Mitra, VP, Lloyd Insulations

Bottle Necks

- Lack of customer understanding / knowledge
- Lack of Specification knowledge
- No technical Standard Specifications like NHB Technical Standard for Cold Store Construction
- No construction documents guidelines
- Different PUF insulation properties
- Adequate PUF thickness for Energy Savings
- Proper fabrication drawings with jointing details
- PUF panels different than conventional Transportation panels
- PUF category different than normal cavity wall pouring in truck body building
- Camlocks in addition to tongue & groove jointing of panels
- Proper insulated door specifications
- Chequered plate flooring finish
- Proper estimation
- Testing of panels

- Excise duty on PUF Panels 12.36%
- Excise duty on PUF Chemical 12.36%
- Import duty on PUF Chemical (MDI) 14.4%
- Import duty on GRP sheet 10%

Mr Amitabha Chaudhary, MD, APL IndiaLinx

He took his agenda as constraints faced by the railways for transporting perishables. He revealed that transport of F & V contributes to 0.02% of the total cargo being transported by railways and negligible amount in terms of the revenues earned. The only produce transported is onion, potato, banana, orange and mango which are seasonal in nature. Given these facts, railways consider fruits and vegetables transport to be comparatively unproductive in monetary terms.

The constraints on the other hand faced by the customer are as follows:

1. Scale: small sizes can't be transported and leads to increase in cost
2. Lack of availability of modes of transport at the point of origin
3. This leads to the introduction of several layers of middlemen which further adds to the cost
4. No loading and unloading in between the transit so produce should be able to survive the time taken in the transit.

Intermodal agencies have worked as a comparatively better option which combines railways and stationary storage at point of produce and consumption.

The role of a nodal body should be to resolve the issue of scale, arrange for food parks and primary storage, incite service providers to offer integrated solutions and services.

He stressed on the policies and steps which benefit the two ends of the cold chain—farmers in realizing a better price for their produce and investor to get a decent ROI on his investment.

S.K. Sarkar, Crystal Logistics

LSP perspective - status & constraints in reefer transportation

Constraints in reefer vehicle:

- Imposition of additional AC tax on reefer vehicles in certain states entailing additional tax burden and clarity.
- High toll expenses enroute.
- Undue holding at check post with temperature sensitive cargo causing extra fuel consumption.
- Lack of trained manpower and driver shortages.
- Vehicle insurance does not cover loss due to AC failure in vehicle.
- Levying of higher road tax for reefer vehicles under commercial vehicle.
- No subsidy from govt. For promoting cold chain development.
- High penalty in different states in absence of original documents in the vehicles.

- No tax benefit – income tax.

Mr. Siddharth Mishra, CEO, HLM

Introduction to HLM India Pvt. Ltd.

- HLM India Pvt. Ltd. is a Joint Venture between HLM Holland BV and TSI
- Almost 40% of India's food and perishable goods produce is wasted due to inadequate cold chain infrastructure for storage and transportation. The Indian government has recognized this and has announced several subsidized and promotion schemes for cold chain solutions for reefer trucks and trailers
- Currently the Indian reefer truck market is dominated by small, local unorganized manufacturers with outdated technology
- The Joint Venture is focusing on addressing the needs of the cold chain industry for this rapidly growing Indian market
- Explained Insulation and construction technology of his company and the advantages of sourcing trucks bodies from HLM.

SESSION IV: Technology & Strategy Perspective

Mr Aman Khanna, Associate Director, Ernst and Young

In the Fresh & Perishable Food supply Chain Driving down the wastage is the main key. Issue that causes more damages than value adds is the lack of supply chain:-

- Improper post harvest handling storage.
- Improper harvesting processing.
- Improper packaging, Poor Handling.
- Multiple players in supply chain.
- No single owner being responsible
- Absence of value added services .For e.g.: Use of crates.

The Loss is about 50,000 crore under 5000 service providers.

Extracting this loss/wastage and distributing it to the service providers (in form of margins). This is the main objective of perishable Food supply chain.

Process Food Supply Chain

Process food includes Chocolates, Confectionaries, milk products and Dairy Products

Maximizing the Efficiency is the main Key.

- Not Much Wastage.
- Just efficient distribution doesn't work.
- Small godowns all over the place.

Driving down wastage in the fresh food supply chain basically includes these three issues:

1. Structural Issues
2. Human Resources issues
3. Individual Enterprise.

Structural Issues can be handled through:

- Greater integration along the chain.
- Greater scale in each segment of chain.
- Single ownership ensures minimal losses.
- Must not change too many hands.

Human resources Issues can be controlled by:-

- Encouragement of staff through training.
- Knowledgeable manpower.
- Temperature Control.

Initiatives that can be taken to support human Resource Challenge:-

- Developing Institution for upgrading the skills of manpower.
- Certification in grading program.
- Creating good manpower.

Enterprise Level Efficiency:

- Service provider need to invest.
- Spreading Knowledge.
- Less hands in supply.

SUMMARY

- Refrigerated Transport is better linked.
- Support of government should be in reducing the wastage.
- Driving down wastage in fresh food and perishable food supply chain.
- Improving efficiency in process food supply chain.

Mr. Purvin Patel, COO/Business Head, Radha Krishna Foodland

5 Key Factors:

1. Infrastructure
2. People/Manpower
3. System
4. Technology system
5. Appliance

5 Areas that needs to be efficient:

The Assets

- The infrastructure associated with supply chain.
- Drivers and delivery boys should bring the stock to the store in most orderly manner.
- In Transit Issue
 - (i) Bribing the cops.

- (ii) Harassment such as clearance problems.
- (iii) Taxation issues.
- Network Effect
 - (i) Storing in well maintained condition.
 - (ii) Not many hands in transferring from farm to retail.
 - (iii) Mishandling should be controlled.

Conclusion:

1. Get the basics right.
2. No wastage.
3. Delivering Right.
4. Efficiency in delivering.

Mr. B T Gorti, Saradiro E Service

Food Safety Concerns in Reefer Containers - Common practices and challenges and emerging trends risk for food safety concerns

Issues:

- Capacity Problems
- Knowledge drivers shortages, and
- Customer demands are the food transportation industry's top challenges

Drivers Role:

Driver shortages and capacity problems may result in a lack of driver education in and adherence to proper procedures for the safe transportation of food

Backhauling

- Food safety is the latest emerging logistics challenge
- Engaging in backhauling (transporting a wrong load in empty truck on a return trip)

Backhauling increases the risk for cross- Contamination if potentially hazardous foods or other items are carried in succession without proper sanitation

Manufacturers

Manufacturers who outsource their transportation needs relinquish control of safety of their product as it moves from the processing facility to the retailer.

- Majority of supply chain operators outsource the transportation to 3rd party logistic
- Good communication and management systems are required to maintain product integrity throughout the distribution chain.
- The other concerns are tampering and sabotage, temperature abuse, and cross contamination
- While there is limited data on food safety failures that are directly attributable to transportation practices, some industry experience suggests that such incidents may be widely underreported

Problems at Distribution Centers

Temperature management is not a core competency

- DC management has limited experience handling temperature sensitive product

- Lack of understanding on the interconnectivity of product temperature management & food quality or safety
- Inconsistent compliance on monitoring temperatures.
- Make random changes without considering the problem from a holistic perspective.

Need to define, implement, enforce, and comply to standard processes for:

- Trailer loading and unloading
- Temperature settings and monitoring throughout supply chain

Solutions for effective preventive controls for food safety concerns

Stakeholder, Consumers, Channel partners, Governmental regulatory staff need extensive awareness of risk and risk management for food safety during cold chain transportation and training on critical food safety concerns.

- Awareness and training program should reaches to mass in villages where basic agriculture produces are produces.
- Standards and guidelines of food safety across the reefer transportation.
- Availability of expertise on development, implementation and monitoring of protocols for reefer container operations across business country covering end to end solution for cold chain business.
- Government involvement in creating a mechanism for regular maintenance of food safety audit and surveillance system.
- Management commitment from business owner and all other stakeholders for sincere and serious development, implementation and monitoring of food safety framework
- from farm to fork.
- Protocols to be develop and ensure to implement for food safety framework for continuous improvement through rigorous food safety surveillance system

Government support for:

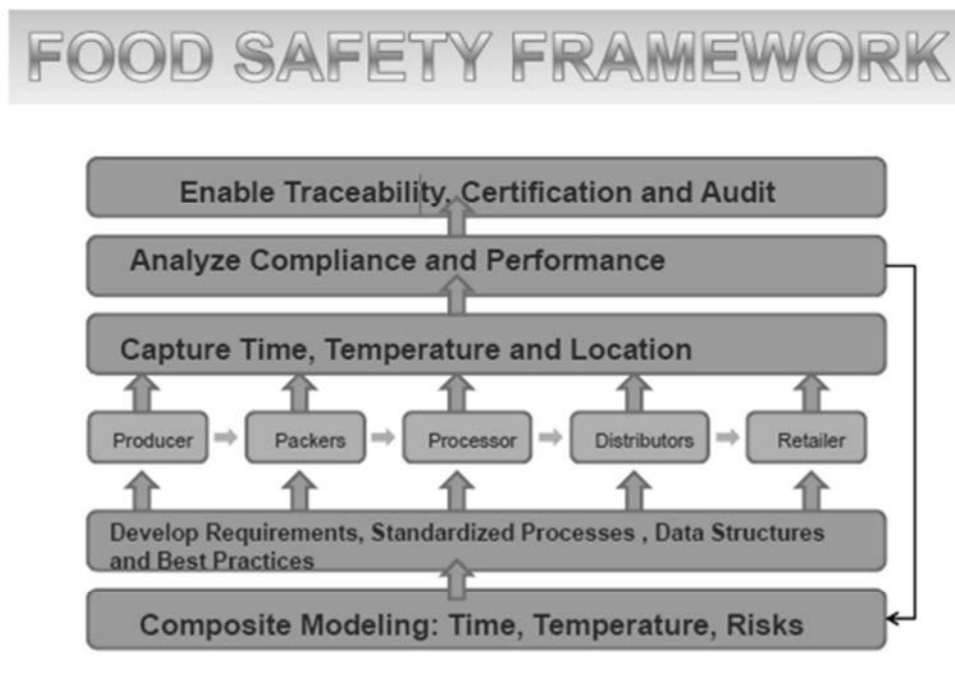
- Solution to make fast track corridor
- Solution to provide the infrastructure facility to meet the global and demanding food safety standards.
- Solution to link up the financial support with development and implementation of food safety framework.
- Further linking up financial support to monitoring and continuous improvement of food safety frame work.

Government fast track solutions

Solutions are to allow easy imports of

- Monitoring equipment for use of appropriate transportation vehicles (i.e., dedicated vehicles when necessary)
- Acquisition of appropriate temperature recording system and tracking system by adapting use of tracking technologies (i.e. satellite or radio frequency identification) technology.
- Technical knowhow for proper monitoring of infrastructure, food safety and food security surveillance system.

- Adoption of packing and operation procedure to distribute food containers safely across the food chain through reefer containers.



Ms Cosima, MD, Lamilux India

During her presentation she explained the benefit of GRP over steel and urged NCCD to take up the issue of import duty on the GRP sheets. Explained the following benefits from GRP:

- **GRP – Glass Reinforced Polymer**
 - Low weight - reducing tare weight, improving load capacity and reducing fuel consumption.
 - Elasticity – allowing better road dynamic stress handling.
 - Water resistance – longer life and better appearance and hygiene.
 - High insulation (0.2 W) – reduced thermal stress on cargo and energy usage.
 - Non corrosive – longer life and hygienic container.

GRP is currently imported into India and does not benefit from reduced customs duty or exemptions provided to cold-chain equipment. She said she has written frequently to authorities to consider the benefits and to facilitate this new technology as cold-chain beneficial import.

Mr Anil Chopra, MD Field Fresh Vegfru

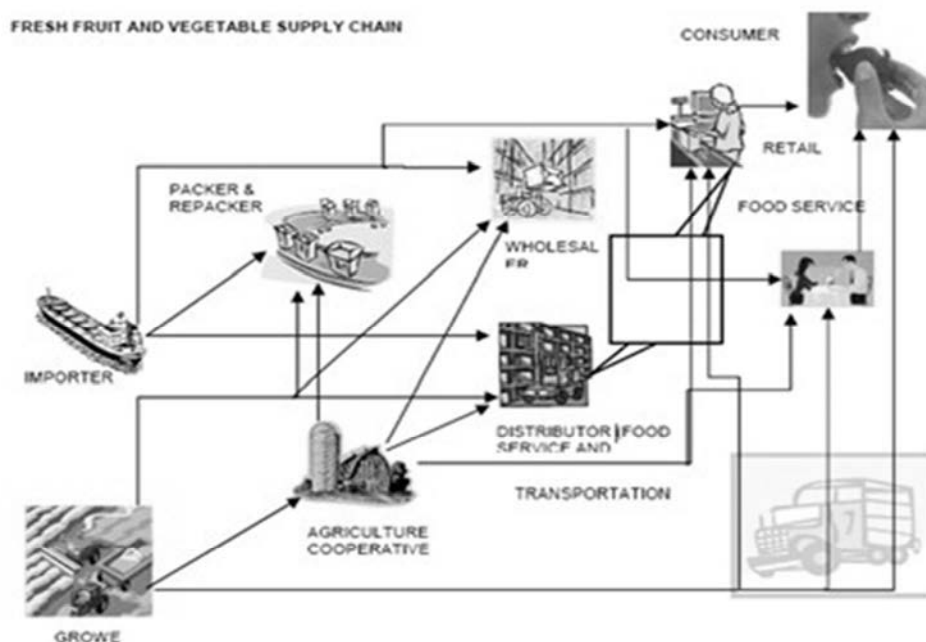
Food logistics – a case for optimization

- n Elements of logistics are remarkably expensive, if not controlled effectively.
- n Holding stock or inventory in warehouses just in case it is needed is a highly costly activity.
- n The stock itself is expensive and might not sell or could become obsolete, or in the case of food, "wastage".

- n Warehouses generally are expensive to build and maintain as well as operate.
- n Vehicles to transport goods between warehouses and stores are major costs, both in terms of capital and running costs, with drivers' wages and ever higher fuel costs.
- n There is thus an imperative to making sure that logistics is carried out effectively and efficiently.

Introducing Reverse Logistics

- n Logistics is “the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements”.
- n Reverse logistics includes all of the activities that are mentioned in the definition above with a difference that reverse logistics encompasses all of these activities as they operate in reverse.
- n Therefore, reverse logistics is: “The process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal”



The arrows are transport vehicles and packaging materials – including cold containers, wagons, trucks, pallets, crates, boxes etc...

Introducing Packaging Logistics and Pools

- n Dominating assumption is still that packaging is a part of logistics, or even a part of warehousing activities
- n Packaging logistics is “The process of planning, implementing and controlling the coordinated packaging system of preparing goods for safe, efficient and effective handling, transport, distribution, storage, retailing, consumption and recovery, reuse or disposal and related information combined with maximizing consumer value, sales and hence profit.”

- n Pool systems for returnable transport packaging are a sub-area within packaging logistics

What are Package Pools?

- The first type of pool system is a transfer system;
 - the sender owns his own need of returnable transport packaging and exchange one-by-one with its suppliers and customers.
- The second type of pool system is a depot system where:
 - an agency owns the packaging and is responsible for package hygiene
 - The agency has two ways of operating: either a book system where the senders continuously provide the agency with accurate data on the location of the packaging,
 - or a deposit system where a deposit follows the packaging all the way until the agency pays back the deposit when empty packaging is returned.
- The third option is a pool system without any return logistics, where:
 - the sender rents the packaging from an agency
 - takes full responsibility for all administration, handling, cleaning, maintenance etc. until surplus or worn-out packaging is sent back to the agency by the sender.

Way forward

- § Sell the vision to all stakeholders begin with Govt (NHB / NHM, MOA)
- § Study / Plan
- § Perform a large-scale pilot test, including project financing
- § Design an administrative concept for the pool system
- § Design a functional standard for crates, pallets etc.
- § Develop a standardize returnable tray, boxes and pallets for fresh produce
- § Develop a specification of requirements to be placed on a business-wide, nationwide returnable packaging material, followed by a tender process
- § Design an administrative concept for the pool system, form a part-owned pool company
- § Roll out – perhaps on a PPP mode

Mr. J M Gupta, APC Polycoat

COLD CHAIN

The cold chain involves the transportation of temperature sensitive products along a supply chain through thermal and refrigerated packaging methods and the logistical planning to protect the integrity of these shipments.

INFLUENCE ON COLD CHAIN DEVELOPMENT

- n GLOBALISATION has made relative world much smaller
- n For transporting perishable products globally, PHYSICAL SEPERATION OF GLOBAL REGIONS needs complex transport operations involved.

COLD CHAIN BOTTLENECKS

DAMAGE TO GOODS due to break of chain

- n By shocks during transportation
- n undue temperature variations
- n Time delay may have negative consequences due to chemical reactions and quality may degrade

EMERGENCE OF COLD CHAIN & ITS HISTORY

- n The refrigerated movement of temp. sensitive goods in practice dates back 1797 when British fishermen used natural ice to preserve their fish stock piles while at sea.
- n In the late 1870s and early 1880s, France was starting to receive large shipments of frozen meat and mutton carcasses from South America, while Great Britain imported frozen beef from Australia and pork and other meat from New Zealand.

TEMPERATURE CONTROLLED ENVIRONMENT: TODAY'S SCENARIO

The success of industries that rely on the cold chain

- n Knowing how to ship a product with temperature control adapted to the shipping circumstances.
- n Different products require different temperature level maintenance to ensure their integrity throughout the travel process. Most common temperature standards are :-
 - n "banana" (13 °C),
 - n "chill" (2 °C),
 - n "frozen" (-18 °C) and
 - n "deep frozen" (-29 °C).

INTEGRITY OF SHIPMENT

- n Staying within this temperature is vital to insure and optimal shelf life. Divergence can result in irrevocable and expensive damage; a product can simply lose any market or useful value.

IMPACT OF TECHNOLOGY ON REEFER TRANSPORTATION SYSTEM DESIGN OVER EXTENDED TIME (30-45 DAYS)

Type of container and refrigeration method

Is essential to ensure that a shipment will remain within a temperature range for an extended period of time comes down largely to the type of container that is used and the refrigeration method. Factors such as

- n duration of transit,
- n the size of the shipment and
- n the ambient or outside temperatures experienced
- n type of packaging required.

Construction of container

- n Can range from small insulated boxes that require dry ice or gel packs, rolling containers,

53 footer reefer which has its own powered refrigeration unit

TEMPERATURE CONTROLLED ENVIRONMENT: COOLING SOURCE TECHNOLOGY-1

The major cold chain technologies

- n **DRY ICE:** Solid carbon dioxide, is about -80°C and is capable of keeping a shipment frozen for an extended period of time. It is particularly used for the shipping of pharmaceuticals, dangerous goods and foodstuffs. Dry ice does not melt, instead it sublimates when it comes in contact with air.
- n **LOW TEMP ICE SLURRY:** Use as secondary refrigerant. A mixture of chilled water and food grade polypropylene
- n **GEL PACKS:** Large shares of pharmaceutical and medicinal shipments are stored at 2 and 8°C classified as chilled products. Method to provide this temperature is to use gel packs containing phase changing substances which can go from solid to liquid and vice versa to control an environment. Can either start off in a frozen or refrigerated state.
- n **EUTECTIC PLATES:** The principle is similar to gel packs. Instead, plates are filled with a liquid and can be reused many times.

TEMPERATURE CONTROLLED ENVIRONMENT: COOLING SOURCE TECHNOLOGY -2

- n **LIQUID NITROGEN:** An especially cold substance, of about -196°C, used to keep packages frozen over a long period of time. Mainly used to transport biological cargo such as tissues and organs.
- n **QUILTS:** Insulated pieces that are placed over or around freight to act as buffer in temperature variations and to maintain the temperature relatively constant. Thus, frozen freight will remain frozen for a longer time period. Can also be used to keep temperature sensitive freight at room temperature while outside conditions can substantially vary (e.g. during the summer or the winter).
- n **REEFERS:** Generic name for a temperature controlled container, which can be a van, small truck, a semi or a standard ISO container. These containers, **which are insulated**, are specially designed to allow temperature controlled air circulation maintained by an attached and independent refrigeration plant. The term increasingly apply to refrigerated forty foot ISO containers. Technological advances are making them much less prone to defects.
- n **REFRIGERATED CONTAINERS: IMPACT OF INSULATION**
 - Impact Of Insulation And Refrigeration System On Container Cost**
 - n **Refrigerated containers** (called "reefers") represent a specific category that account for a growing share of the refrigerated cargo being transported around the world. The cost of reefer containers may vary from \$5,000 to \$30,000.
 - n **Cost Difference** Attributed to
 - n insulation and
 - n the refrigeration unit
 - n All reefers are painted white to increase the albedo (share of the incident light being reflected);

EFFECT OF HIGH ALBEDO

- n high albedo implies less solar energy absorbed by the surface) with the dominant size being 40 high-cube footers (45R1 being the size and type code).

- n For instance a low albedo container can have its internal temperature increase to 50 °C when the external temperature reaches 25 °C on a sunny day while a high albedo container see its internal temperature increase to only 38 °C under the same conditions.
- n The refrigeration unit of a reefer requires an electric power source during transportation and at a container yard.
- n It is important to underline that the refrigeration units are designed to maintain the temperature within a prefixed range, not to cool it down.

REFRIGERATED CONTAINERS: TODAY'S SCENARIO

Warehousing Loading and Unloading Facilities

Before being loaded into a reefer, which requires specialized warehousing and loading /unloading facilities.

A NEW GENERATION OF REEFERS is coming online, which are equipped with an array of sensors monitoring effectively the temperature and shutting the cooling plant when unnecessary. This enables to improve the reliability of temperature control and well as extend the autonomy of the reefer.

The Setting and Organization Of Cold Chains

- n **Shipment Integrity:** Moving a shipment across the supply chain without suffering any setbacks or temperature anomalies requires the establishment of a comprehensive logistical process the maintain the **shipment integrity**. This process concerns several phases ranging from the preparation of the shipments to final verification of the integrity of the shipment at the delivery point:
- n **Shipment preparation:** When a temperature sensitive product is being moved, it is vital to first assess its characteristics. A key issue concerns the temperature conditioning of the shipment, which should be already at the desired temperature. Cold chain devices are commonly designed to keep a temperature constant, but not to bring a shipment to this temperature, so they would be unable to perform adequately if a shipment is not prepared and conditioned. Other concerns include the destination of the shipment and the weather conditions for those regions, such as if the shipment will be exposed to extreme cold or heat along the transport route.

Modal choice key factors.

- Often includes a set of intermediary locations,
- the size and weight of the shipment,
- required exterior temperature environment and
- time restrictions of the product.

Custom procedures: If the freight crosses boundaries, custom procedures can become very important, since cold chain products tend to be time sensitive and more subject to inspection than regular freight (e.g. produce, pharmaceuticals and biological samples). The difficulty of this task differs depending on the nation (or economic bloc) and the gateway since there are variations in procedures and delays.

The "Last Mile": The last stage is the actual delivery of the shipment to its destination, which in logistics is often known as the "last mile". Key considerations when arranging a final delivery concern not only the destination, but the timing.

Integrity and quality assurance: After the shipment has been delivered, any temperature recording devices or known temperature anomalies must be recorded and made known. This is the step of the logistical process that creates trust and accountability, particularly if liability for a damaged shipment is incurred. If problems or anomalies that compromise a shipment do occur, an effort must be made to identify the source and find corrective actions.

FOOD TRANSPORTATION

Innovation And Preservation Method: There is a variety of methods for the transport of food products with the banana accounting for the world's most significant commodity transported in the food cold chain with 20% of all seaborne reefers trade. Land, sea and air modes all have different structures for keeping food fresh throughout the transport chain.

Packaging: Innovations in packaging, fruit and vegetable coatings, bioengineering (controlled ripening), and other techniques reducing the deterioration of food products have helped shippers extend the reach of perishable products. For food products such as fruits and vegetables, time has a direct impact on their **shelf life** and therefore on the potential revenue a consignment may generate. Concomitantly, new transport technologies have permitted the shipment of perishable products over longer distances.

Improved Roads And Intermodal Connections: For instance, improved roads and intermodal connections along the African coast reduced food transport time to European markets from 10 days to 4 days.

Transport Mode: Certain domestic or transnational supply chains may only require one transportation mode, but many times ground shipments are one link in a combination of transport modes. This makes intermodal transfer critical for the cold chain.

Intermodal Shipments: Typically use either 20 or 40 footers refrigerated containers that are capable of holding up to 26 tons of food. The container makes loading and unloading periods shorter and less susceptible to experiencing damage. The environments in these containers are currently controlled electronically by either plugging into a generator or power source on the ship or truck, but early food shipments would cycle air from stores of wet or dry ice to keep the food refrigerated.

CONSOLIDATION OF COLD STORAGE FACILITIES TO CAPTURE NEW OPPORTUNITIES.

- n **Air Travel:** Another efficient mode for transporting foodstuffs is air travel. While this is a preferred form of travel for highly perishable and valuable goods due to its ability to move much faster over longer distances, it does lack the environment control and transfer ease of the ground and sea transports. Also, during the flight the cargo is stored in a 15°C – 20°C environment, but close to 80% of the time the package is exposed to exterior weather while waiting to be loaded onto the plane or being moved to and from the airfield.
- n **Uncompromising Strategy And Regulations:** This is a troubling consideration when importance is placed on quality and freshness. More uncompromising strategies and regulations will have to be embraced and enacted.
- n **Global Seasonal Variations And Efficiency And Reliability Of Temperature Controlled Transportation:** has reached a point which allows the food industry to take advantage of global seasonable variations, meaning that during the winter the southern hemisphere can export perishable goods to the northern hemisphere while an opposite trade, generally of smaller scale, takes place during the summer. Countries

such as Chile have substantially benefited from this and have developed an active agricultural and food transformation industry mainly servicing the North American market during the winter, but also with several niche markets such as wine.

- n **Floriculture Industry:** A similar issue concerns some African countries such as Kenya that have developed a fresh produce and flower industries catering the European market.
- n The fast food industry is also an active user of cold chain logistics as every outlet can be considered as a factory.

VIABILITY ISSUES OF OPERATING COST OF REFRIGERATED TRANSPORT FUEL CONSUMPTION ANALYSIS OF REFRIGERATED TRANSPORT

✓ RATED CAPACITY OF TRUCK	14-15 tons
✓ VEHICLE SIZE	L=25 ft, W=16 ft, H=8-9 ft
✓ GROSS VOLUME OF STORAGE CAPACITY	25x16x8 = 3200 cu. Ft
✓ PER TON CUBIC FT	3200/15 tons = 213 cft/ton
✓ AVG. RUNNING OF TRANSPORT /24 HRS. DURING TRANSIT	16 Hours
✓ FUEL CONSUMPTION IN LTRS.	2.5X16 = 40 Ltrs
✓ COST OF DIESEL	40 ltrs x Rs. 50 = Rs. 2000
✓ AVG. DISTANCE COVERED FROM BOMBAY TO DELHI	16 km
✓ AVG. TIME TAKEN	3 Days
✓ TOTAL COST OF DIESEL USED	Rs. 2000x3 = Rs. 6000
✓ COST OF DIESEL/TON PRODUCT KEPT	6000/15 = Rs. 400
✓ OTHER OHS ASSUMING 100% COST/TON OF VEHICLE:Rs.	800/- per ton
✓ REFRIGERATED TRANSPORTATION COST PER KG OF PRODUCT	Rs. 0.8 per kg
✓ REFRIGERATED STORAGE COST OF TYPICAL SINGLE COMMODITY FOR FULL SEASON PER KG 6-8 MONTHS (fruits & vegetables) @ Rs. 80/- per bag of 50 kg	1.6/- per kg

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EVENT MANAGERS



RTC Attendees

No.	Title	Attendees Names	Designation	Confirmed	Company
1	Mr	Vivek Sharma	COO	8-Feb-2013	Adani Logistics Ltd
2	Mr	Lalit Kumar	MD	7-Feb-2013	Airtech cooling process pvt ltd.
3	Mr	Sanjay Kumar	Director	11-Feb-2013	Airtech cooling process pvt ltd.
4	Mr	Neeraj Aggarwal	Sr. Engineer Sales	7-Feb-2013	Airtech cooling process pvt ltd.
5	Mr	Vijay Ghotia		8-Feb-2013	All India Frozen Food Carrier
6	Mr	Jag Mohan Gupta	DIRECTOR	11-Feb-2013	APC POLYCOAT INDIA PVT. LTD.
7	ashok	Amitabha Chaudhari	MD	28-Feb-2013	APL Indialinx Pvt. Ltd.
8	Mr	Jalaj Gupta	General Manager - Marketing	25-Feb-2013	Ashok Leyland Limited
9	Mr	Chetan Kumria	Director, Supply Chain	14-Feb-2013	Baxter (India) Pvt Ltd.
10	Mr	Aman Rekhi	National Head - SCM	14-Feb-2013	Baxter (India) Pvt Ltd.
11	Mr	Isaac Emmanuel	Business Head	7-Feb-2013	Bayer MaterialScience Pvt Ltd
12	Mr	Sanjeev Saini		13-Feb-2013	BAYER MATERIALSCIENCE PVT LTD.
13	Mr	Rohit Agarwal	Director	26-Feb-2013	Bhoruka Roadlines Ltd
14	Mr	Howard James-Scott	Owner / MD	6-Feb-2013	BigBear Supply Chain Management Pvt Ltd
15	Mr	Harvinder Bhatia	G.M.Sales	6-Feb-2013	Bitzer India
16	Mr	Sujoy Chatterjee	A.G.M.Sales (North & East)	6-Feb-2013	Bitzer India
17	Mr	Ashok Mirchandani	Managing Director, Asia	7-Feb-2013	Carrier Transicold India
18	Mr	Pankaj Mehta	Asst. Director & Business Development	7-Feb-2013	Carrier Transicold India
19	Mr	Tarun Malhotra	National Business Development	7-Feb-2013	Carrier Transicold India
20	Mr	Sarfraz Ahmad Khan	Vice President-Strategy	25-Feb-2013	ColdEX
21	Mr	Ajay Khosla	BD Head	5-Feb-2013	ColdEX
22	Ms	P. Alli Rani	Director	18-Feb-2013	Concor India
23	Mr	Concor		18-Feb-2013	Concor India
24	Mr	Concor		18-Feb-2013	Concor India
25	Mr	Ramesh Paranjpey	Director	8-Feb-2013	Consultant
26	Mr	Pramod Jain	Director	9-Feb-2013	Consultant
27	Mr	Sugato Chandra	Principal	20-Feb-2013	CrossTree
28	Mr	Rajesh Agarwal	CEO, Director	19-Feb-2013	Crystal Logistics
29	Mr	Harish Padnabhan	Assistant General Manager	19-Feb-2013	Daimler India Commercial
30	Mr	Yogesh Nigam	Deputy Manager: TSO	22-Feb-2013	Danfoss Industries Pvt Ltd.
31	Mr	Tonmoy Purkayastha	Asst. Manager	22-Feb-2013	Danfoss Industries Pvt Ltd.
32	Ms	Soumya KHANNA	Deputy Head, Agriculture	19-Feb-2013	Embassy of France in India
33	Mr	Raj Saxena	Director, Supply Chain	25-Feb-2013	Enterpriseforce
34	Mr	Aman Khanna	Associate Director	18-Feb-2013	Ernst & young
35	Mr	Ankur Goel	VICE PRESIDENT	28-Feb-2013	ERNST & YOUNG PRIVATE LIMITED
36	Mr	Anurag Gupta	Associate	28-Feb-2013	ERNST & YOUNG PRIVATE LIMITED
37	Mr	Alok Dubey	DGM - Supply Chain	9-Feb-2013	Field Fresh Foods
38	Mr	Anil Chopra	Managing Director	21-Feb-2013	Field Fresh Vegfru Pvt Ltd & Competent AgriSolutions Pvt Ltd
39	Mr	Gagan Sinha	SECRETARY GENERAL	26-Feb-2013	FOUNDATION EMDA SOUTHASIA
40	Mr	Manish Agarwal	Promoter	20-Feb-2013	Gati Kausar Ltd.
41	Mr	Patram Choudhary	CEO	20-Feb-2013	Gati Kausar Ltd.
42	Mr	Bhaskar Sen	CEO&MD	18-Feb-2013	GeoVision Technologies Pvt. Ltd.
43	Mr	Ch.B.S. Subrahmanyam	Managing Director	11-Feb-2013	GREEN INFRASTRUCTURE PROJECTS PVT. LTD.
44	Mr	Vinod Desai	Director	11-Feb-2013	GREEN INFRASTRUCTURE PROJECTS PVT. LTD.
45	Mr	Vikas Jain	Promoter	11-Feb-2013	H L JAIN ICE & COLD STORAGE PVT. LTD.
46	Mr	Mr. Manoj K. Varghese	National Head - Sales and Marketing	25-Feb-2013	HLM India Pvt. Ltd
47	Mr	Siddharth Mishra	CEO	25-Feb-2013	HLM India Pvt. Ltd
48	Mr	Marcos Bosun Kim	Chief Representative India	22-Feb-2013	HWA Sung T&T Co Ltd.
49	Mr	Shailendra Singh		20-Feb-2013	Icetrail Logistics Pvt. Ltd
50	Mr	Rahul Mathur		20-Feb-2013	Icetrail Logistics Pvt. Ltd
51	Mr	Amit Kumar Singh	Director - Corporate Affairs	8-Feb-2013	Ingersoll - Rand International India Limited
52	Mr	Ashok Gupta	Managing Director	22-Feb-2013	IRC (INDIA) LIMITED
53	Mr	Aradhya Gupta	Management Trainee	22-Feb-2013	IRC (INDIA) LIMITED
54	Mr	Ashok Gupta	MD	6-Feb-2013	IRCL India
55	Mr	Rajender Singh	Faculty	20-Feb-2013	ISHRAE Institute of Excellence
56	Mr	Manish Kaushik	Jindal Mectec Pvt. Ltd	20-Feb-2013	Jindal Mectec Pvt. Ltd
57	Ms	Jaya Singh	Sr. Manager- Marketing	22-Feb-2013	Jindal Mectec Pvt. Ltd.
58	Ms	Cosima Paul	MD	11-Feb-2013	LAMILUX INDIA PVT. LTD.
59	Mr	KK.Mitra	Vice President	6-Feb-2013	LLOYD INSULATIONS INDIA LIMITED
60	Mr	Mohit Khanna	Director	20-Feb-2013	LLOYD INSULATIONS INDIA LIMITED
61	Mr	Deepak Rastogi	Sr.Gen.Manager	8-Feb-2013	LLOYD INSULATIONS INDIA LIMITED

RTC Attendees

No.	Title	Attendees Names	Designation	Confirmed	Company
62	Mr	Ritwik Sinha	Editor	18-Feb-2013	Logistics times
63	Mr	Pradeep Wadhwa	General Manager - SCM	11-Feb-2013	McCain Foods India Pvt Ltd
64	Mr	Seshadri N	Manager - National Dist	11-Feb-2013	McCain Foods India Pvt Ltd
65	Mr.	Mohit Tanwar	DGM - Supply Chain	22-Feb-2013	McDonald's India (Connaught Plaza Restaurants Pvt Ltd)
66	Mr	Arulanandam Ayyasamy	Head Operations	5-Feb-2013	Mehta Frozen Food Carriers P LTD
67	Mr	Harsh Mittal	Director /CEO	15-Feb-2013	Mitaso Comtel Ltd.
68	Mr	Vaibhav Panwar	Manager – Logistics Pro	22-Feb-2013	Mitsui & Co. India Pvt. Ltd.
69	Mr	Anil Arora	MD	28-Feb-2013	MJ Logistics Systems
70	Mr	Jatin Sharma	General Manager-Strate	28-Feb-2013	MJ Logistics Systems
71	Ms	Manisha Mehani	Manager-Business Deve	28-Feb-2013	MJ Logistics Systems
72	Mr	Vinit Anil Ahaley		18-Feb-2013	P.James
73	Mr	Rohit Ahaley		19-Feb-2013	P.James
74	Mr	Dr. Ranjeet Mehta	Senior Secretary	8-Feb-2013	PHD Chamber
75	Mr	Varun Bhardwaj	Asst. Secretary	8-Feb-2013	PHD Chamber
76	Dr	Devendra Jain	Director & Innovator	26-Feb-2013	Pluss Polymers
77	Mr	Purvin Patel	COO / Business Head	20-Feb-2013	Radha Krishna Food Land
78	Mr	K. VIJAY SINGH	BUSINESS DEVELOPMEN	25-Feb-2013	RINAC INDIA LTD,
79	Mr	Suresh Sehgal		8-Feb-2013	S.K.Frozen Food Carriers Pvt. Ltd
80	Mr	C.S.Rao- Director	Director	8-Feb-2013	Samagra Agribusiness Services Private Ltd.Hyderabad
81	Mr	B T Gorti	Director	9-Feb-2013	Saradiro E Service Private limited
82	Mr	Pravesh Sharma	MD	28-Feb-2013	SFAC
83	Mr	Amit Dogra		15-Feb-2013	Siddhi Enterprises
84	Mr	Rohit Gupta		14-Feb-2013	SMG Gases & Chemicals Pvt Ltd
85	Mr	V P Vargheese	Managing Director	18-Feb-2013	SURAKHSHA TRANSPORT SYSTEMS INDIA(P) LTD
86	Mr	V.D. Sasindran Nair		8-Feb-2013	SURAKHSHA TRANSPORT SYSTEMS INDIA(P) LTD
87	Mr	Mr. R.S. Bedi	Chairman	8-Feb-2013	Task Force on Logistics Management , PHD Chamber
88	Mr	Abdul Gafoor		5-Feb-2013	TNT India Pvt Ltd
89	Mr	B.S.Arora	Vice President	22-Feb-2013	Trans Acnr Solutions Pvt Ltd.
90	Mr.	Ved Prakash	Head-Sales and custom	22-Feb-2013	Trans Acnr Solutions Pvt Ltd.
91	Ms	Kruttika DHADE		19-Feb-2013	Ubifrance
92	Mr	Ramesh Kumar	Consultant	8-Feb-2013	Supply Chain India
93	Mr	Balvir Kumar Jain	Consultant	20-Feb-2013	
94	Mr	Sanjeev Saini	Business Development I	20-Feb-2013	Bayer Material Science
95	Mr	Sajal Mittra	Director	21-Feb-2013	Blupith Consultancy Pvt. Ltd

SPEAKERS LIST

	<u>Name</u>	<u>Topic</u>	<u>Organisation</u>
1	Shailender Kumar	Inaugural	Gol
2	Sanjay Bandhopadhyay	Inaugural	Gol
3	Sanjeev Chopra	Inaugural	Gol
4	J. S. Meena	Inaugural	Gol
5	Pawanexh Kohli	NCCD Roadmap	NCCD
6	Howard J Scott	Current and Future Demands: Reefer Transport	BigBear
7	RS Bedi	Reefer Transportation In India: Opportunities & Challenges	PHD
8	Ashok Mirchandani	Refrigeration on Reefer trucks	Carrier
9	Alok Dubey	Status of Reefer Transportation in India: Users perspective	Field Fresh
10	Jag Mohan Gupta	Impact of Insulation on Reefer Transport	APC
11	VP Varghese	Impact of Body Dimensions: Reefer Transportation	Surakhsha
12	KK Mitra	Energy Efficient Insulation For Refrigerated Transportation	Lloyds
13	Chetan Kumria	Bottlenecks to Pharma Transportation	Baxter
14	SK Sarkar	Status of Reefer Transportation in India: LSP perspective	Crystal
15	Siddharth Mishra	Modern designs for reefer transport.	HLM
16	Cosima Paul Klinger	Light weight materials in reefer bodies.	Lamilux
17	Purvin Patel	Bottlenecks to Reefer Transportation: Supply Chain perspective	RKFL
18	Anil Chopra	Bottlenecks for Reverse logistics	Vegfru
19	B.T.Gorti	Food safety and compliance issues in cold chain business	Saradiro
20	RK Sharma	NHB Initiatives in Reefer transport	NHB
21	Anupam Srivastava	Investment opportunitites and outlook	InvestIndia
22	Devendra Jain	Passive cooling for mobile distribution	PlussPoly
23	Amitabha Chaudhari	Rail Based Reefers	APL
24	Aman Khanna	Supply chain Perspective	E&Y

Sampling of Images from NCCD's Reefer Transport Conclave



Last minute Registration (95 prebooked, another 20 arrived for onsite registration)



Inaugural Session





Technical Sessions









Refrigerated transportation: bottlenecks and solutions



Foreword

¹ According to some estimates turnover of the industry is over INR100 billion, growing at 10-15% with a recorded capacity of ~30 mn MT



The cold chain sector is sizeable and fast-growing¹ with key industries including fruits and vegetables, meat, fish, poultry, dairy products, confectionery and pharmaceuticals, among others, being critically dependent on it. However, the sector faces several constraints in its growth, which not only limits its potential, but also results in wastage and loss of value in the industries that depend on it. The host of issues facing the sector must be addressed by the industry itself, given the domain-specific and skill-intensive nature of the business. However, there is a dire need for the Government to lend it additional support due to the significant influence of externalities on its performance and the fact that essential segments (including food and pharmaceuticals) are dependent on it. While the Government has been doing so over the years in the form of various initiatives, a structured and holistic view of the key determinants of success is required to achieve the full potential of the industry.

The cold chain integrates logistics activities in the temperature-sensitive storage and transportation segments, including in activities at the production-gate and point of sale. This integration is facilitated through product-specific protocols, industrial and communication technology and appropriate deployment of infrastructure. This necessitates coordinated development across all these essential segments. On the cold storage front, more than 10 million metric tonnes of capacity has been developed in the previous 10 years, and in all, the country has witnessed commissioning of around 30.4 million metric tonnes of cold storage capacity. However, the essential link between stored products and markets in the refrigerated transport sector has not developed at the same pace as the storage industry.

The National Centre for Cold-chain Development (NCCD), a nodal body set up by the Government of India with the aim of facilitating the development of the cold chain in India, organized a conclave on refrigerated transportation on 7 March 2013 as part of the process to enable this. Its intention was to understand the bottlenecks and issues faced by and the concerns of various stakeholders (including service providers, end users, the Government, equipment and technology providers, and advisors) in the refrigerated transportation sector and identifying potential solutions for them. Stakeholders from the end-user base, equipment providers, OEM industry, policy-makers, technology providers, cold storage owners and logistics service providers from the road, rail and air sectors participated at the conclave. The event included the presentations of the panel speakers, followed by the interactive participation of the audience.

Ernst & Young believes strongly in the potential of the sector, having worked with multiple clients and enabled them to effectively leverage the growth potential that can be exploited from the challenges facing the sector. As part of this commitment to the sector, the firm was the Knowledge Partner for the conclave, which also received support from multiple stakeholders in the cold chain industry, including the National Horticulture Board, the National Horticulture Mission, Carrier Transicold, Invest India, among others.

This report captures the proceedings of the conclave with a focus on bottlenecks and potential solutions, as highlighted by the various participants. The key recommendations for industry participants and policy-makers have been summarized at the end as takeaways from the conclave.

Inaugural session

Panel: Pawanexh Kohli (Chief Advisor, NCCD), Shailendra Kumar (Secy Government of J&K, Ex-Director, NCCD), Sanjay Bandhopadhyay (Jt. Secretary, Ministry of Transport and Highways), Sanjeev Chopra (Jt. Secretary, Department of Agriculture and Cooperation), JP Meena (Jt. Secretary, Ministry of Food Processing Industries)



Key points of discussion

The Indian Government is cognizant of the poor state of cold chain logistics and has identified several areas of concern, a key one among them being inadequate road connectivity. The Ministry of Road Transport and Highways (MORTH) has outlaid its plans for disbursement of funds for construction and upgrading of 45,000 kms of roads, to ensure improved connectivity with remote areas in the country.

While India's national and state highways span more than 71,000 kms, the crucial first and last mile road links are grossly inadequate. Significant quantities of perishable goods are wasted, with the estimated loss amounting to around INR1000 billion at current prices. Apart from the entire system suffering monetary losses, this results in unavailability of food for those for whom it is intended at a time when malnutrition among children is as high as 45% in the country.

To address the lack of technical skills in the labor force, there is the urgent need to train personnel through certification courses, to not only enhance skills in handling the goods but also in operating and managing equipment used for refrigerated transportation.

The Government has implemented lenient tax regulations and is actively seeking the opinions of industry players to encourage the growth of cold chain logistics in India. It has provided refrigerated transport the benefit of 100% Foreign Direct Investment (FDI) and has waived levy of Excise Tax on domestic production and customs for import of ready-to-use reefer equipment.

Among the major difficulties faced by service providers are the long queues at check-posts on their routes, which significantly increases their waiting time, reduces their efficiency and results in wastage. MORTH plans to introduce the use of Radio Frequency Identification (RFID) tags on reefer vehicles and implement this initiative by the beginning of the next financial year to encourage the growth of refrigerated transportation in the country. This is expected to reduce the long waiting time and enhance the efficiency of the supply chain.

The Ministry of Food Processing Industry (MOFPI) recognizes the need to address issues and concerns relating to other areas of the supply chain, and is working on 63 projects on integrated food chains. In the next two years, it plans to implement another 75 projects with an investment of INR15 billion.

Plenary session

Key points of discussion

India's cold chain sector is fragmented with more than 3,500 players, with most of them being in the unorganized sector. On the other hand, consumers increasingly prefer scaled and integrated service providers, who can provide end-to-end solutions.

US, 80%–85% of fruits and vegetables are transported within the country by using cold chain logistics. This percentage is negligible in India.

Other key challenges faced in India's cold chain include power outages and high costs on account of increased transit and waiting time. In most Indian airports, the availability of cold rooms,

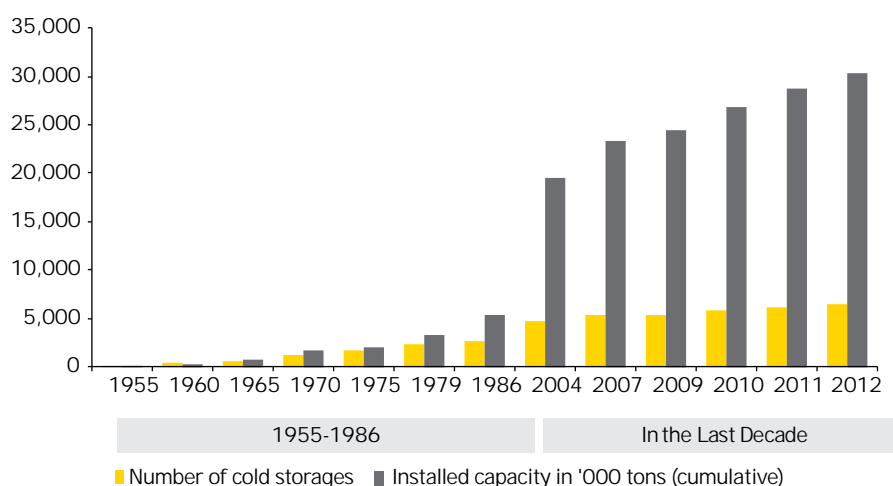
The domestic reefer market is large and could prove to be a catalyst in the growth of transportation of fruits and vegetables, fish and other horticultural products. However, a further boost needs to be given to the development of suitable refrigeration systems including temperature controllers. End users also need to be involved in this by closely coordinating with the refrigeration industry.

Investment in facilitating rail movement of reefer containers is the need of the hour. To achieve this, the transport industry, shippers and the Government should create a task force to decide on strategic locations where inland pre-cooling and cold storage facilities can be developed, since these are currently grossly inadequate in India.

The Government as well as private bodies should promote organized retailing in the country, since that will encourage investment in the cold chain sector, including in reefer transport. Furthermore, technical standards and specifications followed in India are also often unsuitable for Indian conditions, which results in the low performance of standard refrigerated systems. Moreover, lack of connectivity between distribution centers adds to the woes of service providers as well as consumers.

The Government needs to accelerate implementation of Goods and Services Tax (GST), since the current tax regime is a major deterrent to organized and optimized warehousing. It should also initiate training on produce-specific best practices.

Figure1: Cold Storage Capacity in India



Sources: NCCD

The cold chain infrastructure for several temperature-sensitive goods, including horticultural produce, is in an abysmal state in India, with almost 30%–40% of these perishables being wasted. This is, to a large extent, due to the limited use of cold chain logistics for transport of perishable products. According to a study conducted in the

despite advance notices given for the unloading of large consignments of temperature-sensitive products, is a challenge. There is a critical need for provision of dollies at international airports for movement of temperature-sensitive cargo from airport warehouses to the tarmac where aircraft are parked.



Panel: RS Bedi (Chairman, Task Force on Logistics, PHDCCI), RK Sharma (Director, NHB), Anupam Srivastava (MD, Invest India), Pawanexh Kohli (Chief Advisor, NCCD)

Figure 2: Illustrative example: Wastage of perishables on account of multiple handling not only causes waste, but also significantly increases final prices for consumers.



Souces: E&Y analysis

There are several incentive schemes that have been implemented by the Government to promote the reefer industry as well as the standards created by NHB. The lack of domain-specific skills sets is clearly evident from the state of domestic movement of mangoes, as highlighted by NHB. The sheer quantum of horticultural produce and the associated wastage presents an attractive opportunity for service providers and the food industry.

Invest India is attracting the increasing interest of international players in this industry. This has been given a boost by a series of investment roundtables that have been mainly focusing on the food processing and cold-chain sector. In addition, NCCD's role as the facilitator between the Government and private industry has been significant.



Technology user's perspective

Panel: Pawanexh Kohli (Chief Advisor, NCCD), Alok Dubey (DGM, Fieldfresh Foods), Ashok Mirchandani (MD - APAC, Carrier Transicold India), Devendra Jain (Director & Innovator, Pluss Polymers), Aman Rekhi (National Supply Chain Manager, Baxter (India) Pvt. Ltd.), Howard J Scott (MD, Big Bear Supply Chain Management), VP Vargheese (MD, Surakhsha Transport Systems)



Key points of discussion

There is a dearth of reefer vehicles and service providers with a cross-regional presence. The lack of India-specific designs, including multi-zone refrigerated transport, is also a serious bottleneck. Moreover, standardization of vehicle boxes is critical, since this would enable effective carriage of goods. Furthermore, inability to fully fill up boxes due to non-standardization leads to higher costs.

Another challenge the user industry routinely faces is the lack of availability of skilled operators of reefer transport vehicles. This leads to significant wastage during loading and unloading of trucks as well as due to improper management during transit. Structured training of operators through certification courses would go a long way in reducing this wastage.

Amendments to the Central Motor Vehicles Rules (CMVR), 1989 to provide more vertical space in the cabins of multi-axle motor vehicles (to make an allowance for tilting) is required, since the overall height currently specified is still based on the limited types of commercial vehicles that were in use earlier. However, the technological changes that have taken place in such vehicles since then necessitates this change.

While refrigerated and insulated trucks perform similar functions, a different tariff head applies to them. The Government should consider bringing both under the same tariff head.

A key issue often faced by service providers is technology that is useful for minimizing losses and increasing efficiencies is not adopted due to end users' reluctance to pay a premium for this.

Passive cooling options to service the last-mile and portable delivery mechanism are required. Furthermore, the use of phase change material and eutectic cells would free internal capacity on trucks, and reduce risk and dependence on connected power for pre-determined periods.

Implementation of the following steps could lead to significant improvements in India's cold chain space:

- ▶ Introducing plug-in power points to recharge refrigerators at petrol pumps, since they carry goods and have a limited charge while in transit.
- ▶ A fast-track lane for perishables should be introduced at check points near toll booths. This would cut down on the amount of time reefer containers need to stop currently, and thereby, reduce wastage and delivery time.
- ▶ The Government needs to bring down the import duty on the components of reefer vehicles in the country. Currently, this is less for a finished reefer vehicle and than its components. Reducing the import duty on components would enable these to be assembled in India and would help the overall growth of the segment.
- ▶ Allowing non-hazardous drugs in passenger aircraft would also substantially bring down the time taken to deliver products.
- ▶ Furthermore, there is a need for an integrated packaging solution that will ensure the longevity of products.

Logistics provider's perspective

Panel: RK Sharma (Director, NHB), P Alli Rani (CEO FEHL and Director (Finance), Concor), KK Mitra (Vice President, Lloyd Insulation India Limited), Amitabha Chaudhari (MD, APL IndiaLinx (NOL Group)), SK Sarkar (COO, Crystal Logistics), Siddharth Mishra (CEO, HLM India Pvt. Ltd.)



Key points of discussion

The major constraints faced by suppliers include end users' reluctance to pay for implementation of technology that can help to reduce losses and minimize waste.

The use of rail for refrigerated cold chain is not currently feasible for many commodities due to dearth of railway's facilities for loading and unloading of goods at intermediate stations.

The workforce, especially drivers, need to take certification courses to ensure that they are aware of the requirements of the products they carry and understand the importance of maintaining stringent standards.

Furthermore, the imposition of additional AC tax on reefer vehicles entails an additional tax burden on farmers and adds to their difficulties, since in many cases, they are unable to afford this extra cost to transport their goods.

Reefer trucks containing temperature-sensitive cargo being unnecessarily detained not only leads to additional fuel consumption, but also damages perishable food products.

Added to this is the fact that vehicle insurance does not cover financial losses due to power failure, which is a frequent occurrence. Insurance bodies should consider amending this clause.

Lack of knowledge of specifications is another key constraint. There are cases where customers may not be aware of the best size of vehicle needed to transport their goods, and consequently, may order a vehicle that is either too small or large to meet their needs. A proper understanding and assessment of the needs of customers is therefore essential for service providers.

Furthermore, there are no specific guidelines that set the standard for refrigerated transport. Regulatory authorities should therefore consider formulating standards that are similar to the NHB Technical Standard for Cold Store Construction.

Technical and supply chain perspective

Participants: Aman Khanna (Associate Director, Ernst & Young), Purvin Patel (COO/ Business Head, Radha Krishna FoodLand), BT Gorti (Saradiro E Service Pvt. Ltd.), Cosima Klinger-Paul (Managing Director, Lamilux India Pvt. Ltd.), Anil Chopra (MD, Field Fresh Vegfru Pvt. Ltd.), Jag Mohan Gupta (Director, APC Polycoat India Pvt. Ltd.)



Key points of discussion

It is important for all the stakeholders in the industry to recognize the fact that incentives provided by the Government are not intended to help service providers survive in their existing state, since this would imply that it is funding the system's inefficiencies. The objective must be to leverage government support to become more efficient and relevant, and thereby drive growth and profitability, and consequently, reduce the requirement for sustained government support.

In the fruit and vegetable supply chain, the solution is to eliminate (or at least minimize) wastage. The bulk of the current 30%-40% loss witnessed in the segment at present is not due to the lack of a cold chain (or refrigerated trucking) in the country, but on account of multiple structural factors larger than the cold chain. These include the following:

- Improper post-harvest handling and storage
- Unsuitable harvesting practices
- Improper packaging
- Inappropriate handling during transportation and storage
- Multiple handling points due to a large number of intermediaries
- Unorganized and small-scale intermediaries, who have little

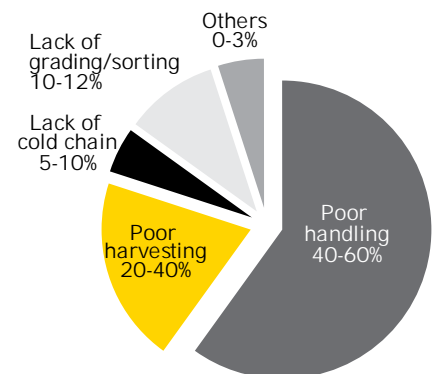
incentive or vision to invest in large-scale and sophisticated infrastructure that can yield scale and scope advantages

- Absence of grading or sorting (leading to loss of value)

Enabling value by eliminating waste and redistributing this among producers, service providers and end users should be the aim, and any government initiative that leads to this will be good for all stakeholders, including transporters of refrigerated vehicles.

Figure 3: Key factors accounting for wastage of perishables

What are the reasons for wastage?



Sources: E&Y estimates

In the processed foods supply chain, the key is to maximize efficiencies by implementing efficient distribution networks. Large hub warehouses servicing smaller spoke or satellite warehouses close to consumption hubs, as compared to smaller scattered godowns, will further improve the efficiency of the system and minimize waste, damage and pilferage. It will enable enhanced utilization of fleets of large trucks between production centers and hubs as well as deployment of smaller (but more fuel efficient) trucks between the hubs and spokes to the retail shelf. Larger warehouses will also enable scale economies, investment in improved equipment and improve overall standards of warehousing and significantly reduce wastage.

The government permit granted to reefer trucks needs to be renewed annually and is typically not re-issued after eight years, after which a vehicle is permitted to only run on intra-state routes. Regulatory bodies should reconsider this provision, since it limits the operating life of reefers.

Non-availability of two-way cargo or back-haulage and interstate barriers contribute significantly to sub-optimal standards in reefer transport. This not only increases their operating costs, but also adversely affects timely delivery of products and optimum utilization of fleets.

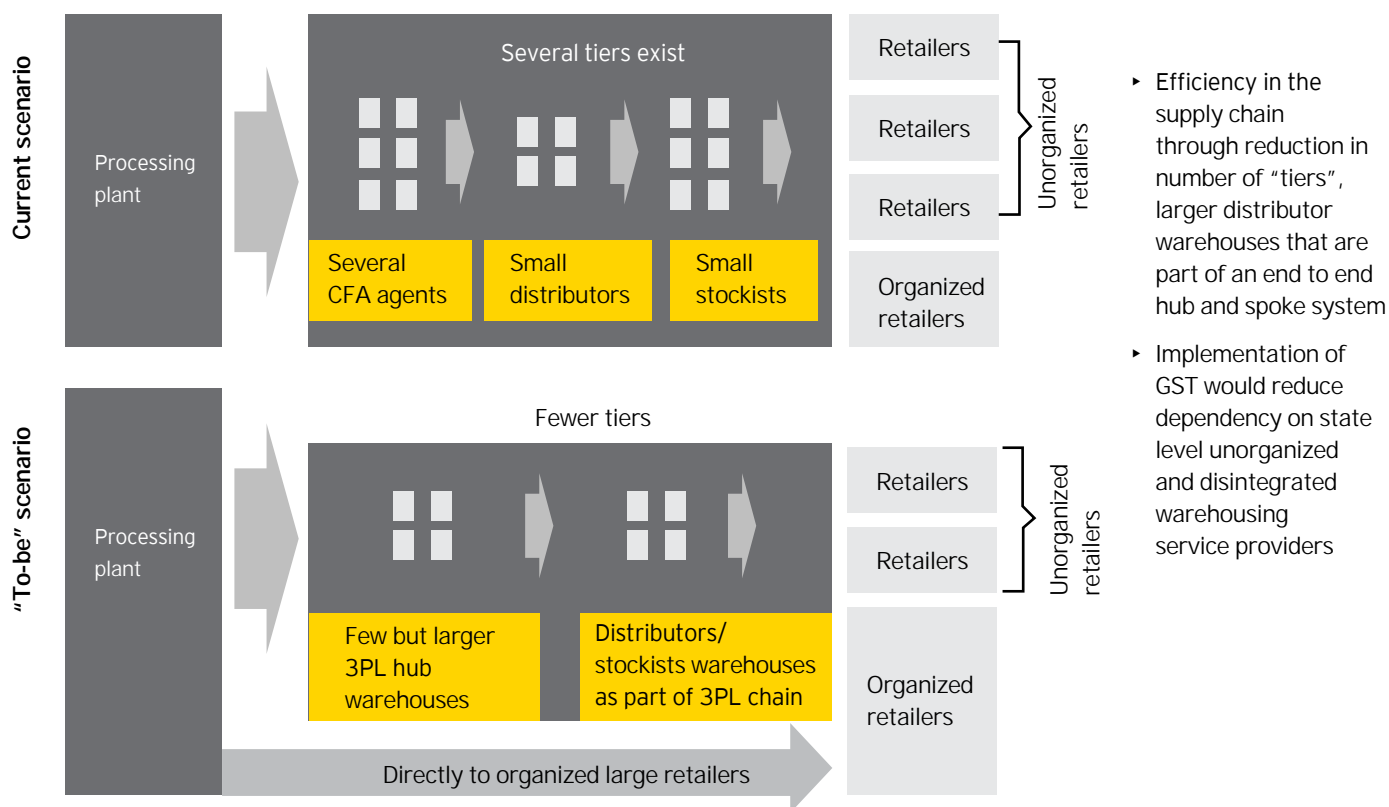
Furthermore, the lack of backward and forward linkages to supplement cold chain results in the absence of a

complete solution to address quality and marketability issues relating to perishable products.

Additionally, the cost of a permit license should not be charged to carriers of food products, since this resource is already critically depleted, and the gap is expected to increase further.

It is imperative that specific policy interventions are undertaken to facilitate the use of data loggers and operational monitors to stringently support the traceability and quality norms of food products. Moreover, the import duty on Glassfibre Reinforced Plastic (GRP) sheets needs to be reduced to facilitate their usage, given their strength and potential for energy saving.

Figure 4: Inefficiencies in the processed foods supply chain



Sources: E&Y analysis

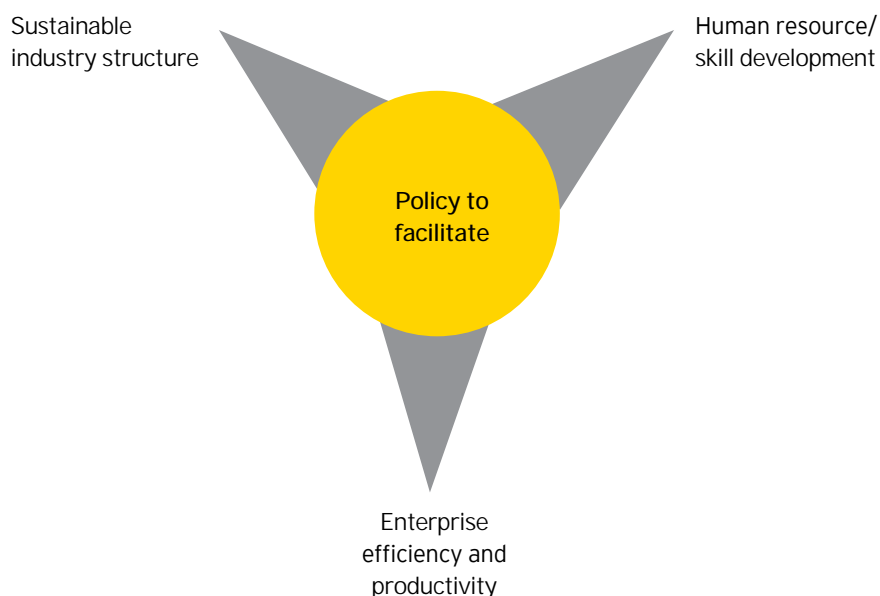
Conclusions and recommendations

A large number of factors that influence the performance of refrigerated transportation businesses and the larger cold chain are not within the control of service providers and end users. For example, as a refrigerated trucking service provider, one is dependent on the quality of roads on which one's trucks are plying, the check posts these trucks will find on their way and the ethics (or lack thereof!) of police personnel deployed on the route.

However, although external factors such as the availability of adequate infrastructure and favorable policies that promote efficiencies will continue to influence performance, a large part of the woes faced in this industry will have to be addressed through its evolution – an evolution that will enable it to bring more and more of the requisite factors required to enhance the performance of the segment within its control.

The key to achievement of this evolution is bringing down waste in the fresh food supply chain and maximizing efficiencies in the processed food supply chain. This requires changes at the industry structure, human resource and individual enterprise levels. Policy support will only be meaningful in the long run if it supports and acts in conjunction with these changes.

Figure 5: Key areas of required policy support to enable all round development of the industry



Sustainable industry structure

The structural changes required include increased integration along the chain and enhanced scale in each of its segments. Produce should not change hands as many times as it does. Single ownership of produce along the chain will ensure minimal losses at the points at which these occur at present – these are the points at which the product changes hands. Furthermore, achievement of greater scale in each segment will enable investment, economies of scale and implementation of more organized working practices than at present (leading to less damage, pilferage, etc.).

As far as processed food is concerned, greater integration would mean a leaner supply chain as compared to a multi-tiered one which is partly on account of distortion of indirect taxes in the country and partly due to the fact that unlike in the developed world, organized retail penetration is very low in India. Retailers across the world seek to maximize their efficiencies by driving efficiencies across the chain, and they are only able to achieve this by controlling as much of it as possible.

Policies can facilitate these changes by removing or easing regulations that discourage scale and integration. Some specific interventions that can go a long way in facilitating the evolution of a sustainable industry structure are as follows:

- ▶ Bringing ancillary activities associated with refrigerated transport under the ambit of benefits currently available for larger cold chain (eg. investments in ripening chambers, grading and sorting, packaging, handling, etc.)
- ▶ Continuing liberalization of agri-marketing laws (revamping of Agriculture Produce Marketing Committee (APMC) Act)
- ▶ Accelerating consolidation or cooperation at the farmers' end by facilitating the Public Private Partnership in Integrated Agriculture Development (PPPIAD) program
- ▶ Considering amendments in regulations to permit an increase in the height in multi-axle reefer vehicles in view of technological advances
- ▶ Facilitating M&A, Venture Capital and Private Equity investments in the sector
- ▶ Limiting tax exemptions for Small Scale Industries
- ▶ Continuing to encourage investments through incentives in cold chains and aligning these incentives to ensure establishment of infrastructure that is aligned to the produce supply chain
- ▶ Encouraging value-added services including grading and sorting, and the use of crates for handling and transportation
- ▶ Developing and enforcing standards and certifications
- ▶ Accelerating implementation of GST

Industry participants can facilitate these changes by taking a long-term view when investing in development of capabilities (manpower and capital), which can help them reach the scale and network required for superior performance.

Human resource and skill development

Changes required in human resources include increased and enhanced training to develop technically competent personnel, who are capable of understanding the temperature and humidity control requirements of various perishables and operating sophisticated controlled atmosphere equipment. This would require uplifting the image of the industry from being a "last resort" for employment-seekers to that of a sector of choice that will help to shape the future of the country.

At the policy level, multiple initiatives can facilitate these changes:

- ▶ Exemption from Service Tax on services including education and training of transporters of perishable produce (as is the case for these services provided to farmers)
- ▶ Development and facilitation of Public Private Partnership models for the establishment and operation of specific training facilities for cold chain personnel (independently or as part of a larger logistics training infrastructure)



- ▶ Support provided to industry players or associations to establish certification and accreditation standards for skills

Industry participants can facilitate these changes by the following initiatives:

- ▶ Collaborating and proactively reaching out to the Government with workable models to set up infrastructure and resources for skill development
- ▶ Creating a certification and grading system and recognizing its importance in recruitment and progression of employees (This system could be developed by industry players coming together on a common platform, e.g., an industry association.)
- ▶ Introducing incentives for employees to enhance their skills by participating in such certified training programs
- ▶ Increasing credibility and enhancing perception of the importance of training through the implementation of training initiatives, e.g., apprenticeship programs: This would require that the training provided by institutions is complemented by hands-on practical practice sessions. Visible upgrading of skills in terms of gaining knowledge of the latest technology, work practices, and consequently, improved career opportunities for people undergoing training, would create a natural incentive for increased enrolment in such programs.
- ▶ Monetary and progression incentives for trained vis-à-vis untrained personnel by companies: For example, progression to certain levels could be linked to achievement of a particular certification.
- ▶ Undertaking initiatives to uplift the image of the industry to attract superior talent

Efficiency and productivity of enterprises

On the individual enterprise front, there is quite a bit service providers and users need to do. The latter should be more open and receptive to the idea of giving volume commitments to reliable service providers, who, in turn, need to take a long-term view with respect to investing in the right kind of equipment and technology infrastructure and becoming more efficient in their service delivery.

The obsessive focus of service users on bringing down unit costs on a piecemeal basis needs to be replaced by a holistic view of their own supply chains, to enable integrated service







providers to deliver savings at the system level. Service providers, in turn, need to be able to develop end-to-end propositions and build the business case for system-level cost savings for service users, instead of cutting corners (and compromising on quality) to meet cost-reduction targets at a piecemeal level while driving up the total costs in the form of administering multiple disjointed service providers, wastage, pilferages, etc.

There is currently lack of trust between service users and providers, with users demanding continuous cost reduction at individual routes and warehouse levels, partly because of lack of faith in providers' ability to deliver end-to-end solutions that can address system costs. Users therefore prefer to keep the administration cost of multiple service providers in-house, although this is a non-core activity for them. Service providers, on the other hand, need commitments on volume and integrated outsourcing contracts, to be able to invest in delivering the end-to-end services required. This "Catch 22" situation needs to be resolved, and the service provider and user will have to meet half way to make this happen.

Policy support for implementation of such initiatives can be in the form of the following:

- ▶ Incentives for service providers that facilitate investments in end-to-end and quality solutions and establishment of infrastructure that is aligned to the perishable supply chain instead of piecemeal infrastructure built at any location

- ▶ Innovative and unconventional incentive mechanisms to encourage service users to move away from piecemeal to end-to-end outsourcing, thereby releasing the pressure on costs at the individual level (Such pressures are responsible for low-quality services and leads to wastage, damage and overall poor service delivery.)

Some specific policy interventions that can enhance enterprise-level productivity and efficiency:

- ▶ Removal or reduction of customs duties on imported reefer equipment parts to encourage assembly of such equipment within India
- ▶ Formulation of standards for refrigerated transportation in line with the requirements of Indian conditions on similar lines to the NHB Technical Standards for Cold Store Construction
- ▶ MORTH considering allocation of fast-track lane for perishables to reduce the time reefer containers need to stop at toll booths in order to reduce wastage
- ▶ Increased use of data loggers and operational monitors to support stringent food traceability and quality norms
- ▶ Reduced import duty on GRP sheets to facilitate their usage, given their energy-saving potential
- ▶ Facilitated development and availability of Infrastructure at airports, e.g., cold rooms and dollies for the movement of temperature-sensitive cargo from airport warehouses to the tarmac

- ▶ Permission for movement of non-hazardous drugs in passenger aircraft
- ▶ Regulatory bodies reconsidering the provision that requires a national permit granted to reefer trucks to be renewed annually and permitting issue of a permit for more than eight years
- ▶ Removal of permit license fee for carriers of perishable products
- ▶ Inclusion of transportation of agricultural produce as part of priority sector in agriculture
- ▶ Extension of custom and excise duties for temperature/energy-monitoring and optimization of gadgets
- ▶ Appropriate amendments in regulations to eliminate unwarranted rise in the cost of reefer trucks²
- ▶ Additional incentives provided for vehicles with temperature logging/monitoring equipment
- ▶ Establishment of standards, protocols and guidelines that span first-mile preconditioning, last-mile delivery and ancillary activities associated with the cold chain, e.g., product-specific designs for packing houses, handling, monitoring equipment, etc.

Furthermore, insurance for vehicles does not cover any financial loss due to power failure, which is a frequent occurrence. Insurance companies need to consider amending this clause.

Industry participants can facilitate the changes mentioned above by implementing the following initiatives:

- ▶ Introducing passive cooling to service the last mile, and use phase change materials (PCMs) and eutectic cells to free internal capacity on trucks and reduce their risk and dependence on connected power for pre-determined periods
- ▶ Developing integrated packaging solutions that will ensure the longevity of products, even if they have to be transported over long distances
- ▶ Being aware of the specifications and sizes of transportation vehicles to ensure optimal solutions
- ▶ Standardizing vehicle boxes to ensure effective carriage of goods
- ▶ Developing cost-effective refrigeration systems with temperature controllers through research and development efforts
- ▶ Enforcing stringent food traceability and quality norms to ensure improved use of cold chain logistics to enhance the quality of food items

² Exemption from excise duty is available for completed reefer trucks, but not for individual components. Since reefer trucks are assembled according to specific requirements and are not sold off the shelf, availing of excise duty benefits is procedurally challenging. Availing intended benefits for the sector thus leads to unintended cost escalation that is unavoidable if one wants to gain from the benefits provided.

Glossary

APMC	Agricultural Produce Marketing Committee	NCCD	National Centre for Cold-chain development
CMVR	Central Motor Vehicles Rule	NHB	National Horticulture Board
FEHL	Fresh and Healthy Enterprises Limited	PPPIAD	Public Private Partnership for Integrated Programme
FDI	Foreign Direct Investment	RFID	Radio Frequency Identification
GST	Goods and Service Tax	SSI	Small Scale Industries
MOFPI	Ministry of Food Processing Industry		
MRH	Ministry of Road Transport and Highway		

About NCCD

NCCD is a nodal body set up by the Government of India with the aim to facilitate cold chain development across all user segments through policy intervention, capacity building, standardization and awareness programs. NCCD includes members from private industry, policy influencers, knowledge partners and other government agencies.



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Dear Conclave Participants

Greetings!!!

We're glad you were able to join us for the NCCD Conclave on Refrigerated Transportation. Thanks to your participation, the conference was inspiring.

Your presence and the interchange of ideas among government representatives, industry colleagues, and all the stakeholders provided valuable inputs regarding bottlenecks faced by the Refrigerated transport industry in our country.

We are receiving feedback and emails from some of our participants and thank you for the same. Our next events planned are an education workshops (members only), conclave on cold storages, conclave on best practices and others topics depending on demand as we receive from all of you.

This conclave was organized with a fixed aim to understand support needed from NCCD and the policy makers of the Government of India. The brainstorming sessions brought out some vital issues faced by the refrigerated transport sector. The sectors covered included road, rail, air, sea and across associated cargoes of Food (fresh, processed & frozen), Pharmaceuticals products and Life Sciences.

Those who would like to express other particular points on the bottlenecks faced by this sector, please email your thoughts to NCCD.India@gmail.com. **Kindly use the subject "Reefer bottlenecks".**

The report from the conclave shall be emailed to all NCCD members as soon as ready. Others can view a copy from the website thereafter.

Again we are thankful to all the delegates for bringing forth the great ideas and opinions on the opportunities and challenges faced by the sector.

The pictures from the event can be viewed at [Picassa](#) or on Facebook.

The compilation of the event (video recording and presentations) is available on DVD. **To order the DVD please send your request – kindly include your return mailing address.**

Regards
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