COLD STORAGE IN INDIA

All the way from farm to fork
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1. WHAT IS COLD STORAGE (CS)?

CS facilities are typically used to stock the following products:

Categorisation of products stored in CS facilities:

- **FOOD AND GROCERIES (F&G)**
  - Vegetables
  - Fruits
  - Dairy Products
  - Meat
  - Seafood etc.

- **HEALTHCARE**
  - Drugs
  - Pharmaceuticals
  - Vaccines
  - Blood etc.

- **OTHERS**
  - Flowers
  - Wine
  - Tobacco
  - Chemicals etc.

Source: CBRE Research, Q4 2020; CBRE’s Asia Pacific Cold Storage, An Investor’s Guide, July 2019
Temperature ranges in a CS facility

A CS facility can enable various temperature-controlled environments based on the products stored as highlighted below:

**Typical temperature ranges in a CS facility:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frozen</td>
<td>BELOW - 18°C</td>
</tr>
<tr>
<td>Chilled</td>
<td>0°C to 10°C</td>
</tr>
<tr>
<td>Mildly chilled</td>
<td>10°C to 20°C</td>
</tr>
<tr>
<td>Normal</td>
<td>&gt;20°C</td>
</tr>
</tbody>
</table>

**LEGENDS**

- Meat
- Dairy products
- Vegetables
- Healthcare
- Seafood
- Wine
- Fruits
- Flowers

Source: CBRE Research, Q4 2020
Illustrated on the right is a typical layout of a CS facility for F&G purposes. Further customisation can be undertaken depending on the temperature conditions required for the storage of a particular product.

1. Dock with Shelter Doors
2. Vapour Barrier and Product Staging Area
3. Evaporators
4. High Speed Roller Doors
5. Frozen and Chilled Chambers
6. Insulated Floors and Surfaces
7. Processing Area
8. Condensers
9. Compressor Plant

Source: CBRE Research, Q4 2020; CBRE’s Asia Pacific Cold Storage, An Investor’s Guide, July 2019
2. WHAT IS THE SIGNIFICANCE OF CS IN INDIA?

CS facilities play an integral role in improving the shelf life of products, thereby reducing wastage. Moreover, following the COVID-19 outbreak, the CS segment is witnessing robust demand on the back of a surge in online grocery and fresh food sales. The graphic below highlights the significance and need for CS facilities in India.

**SIGNIFICANCE IN INDIA**
- Largest milk producer globally¹
- 2nd largest food producer globally²
- 6th largest F&G market globally²

**NEED FOR CS IN INDIA**
- The annual post-harvest loss of major agricultural produce is worth about USD 13.16 billion⁵
- This loss is highest for fruits and vegetables, at 5-16%
- More than 75% of the CS capacity is used for only storing horticulture crops including potatoes⁶

**SIGNIFICANCE IN INDIA**
- 3rd largest producer of generic medicine globally³; accounts for 20% of the global supply (by volume)³
- Contributes to more than half of the global supply of vaccines³

**NEED FOR CS IN INDIA**
- At least 25% of the vaccines expire before reaching doctors and patients⁷

**SIGNIFICANCE IN INDIA**
- The Indian wine industry has an annual turnover of about USD 83 million⁴
- India houses the first Asian Winery outside China that sells 1 million cases in a year⁴

**NEED FOR CS IN INDIA**
- The market is mostly untapped in India

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¹ Agricultural and Processed Food Products Export Development Authority (APEDA), 2018
² Food Safety and Standards Authority of India (FSSAI), 2018
³ Invest India, 2020
⁴ FSSAI, 2018
⁵ Central Institute of Post-Harvest and Engineering and Technology (CIPHET), calculated using production data of 2012-13 at 2014 wholesale prices. Conversion rate adopted: 1 USD = INR 70.38
⁶ Public Information Bureau, 2019
⁷ Immunisation Technical Support Unit, Ministry of Health, 2015

Source: CBRE Research, Q4 2020; CBRE’s Asia Pacific Cold Storage, An Investor’s Guide, July 2019
Cold chain infrastructure and gap analysis in India

The cold chain network plays a vital role in reducing the loss of the produce and improving efficiency. The figure below highlights the spatial spread of the cold chain infrastructure in India.

CS in India: Current footprint
To improve supply chain efficiency, the government has developed CS facilities across the country over the last decade. **Currently, the overall CS capacity in India stands at about 37-39 million tonnes.** It can be observed from the figure below that the distribution of CS facilities is not uniform. While states such as Uttar Pradesh and West Bengal lead in terms of installed capacity, a considerable lag in terms of transport network results in wastage/spoilage. Similarly, the installed CS capacity is relatively low in Andhra Pradesh, considering that the state leads the country in fruit production, thereby resulting in significant spoilage.

Typically, CS facilities in India are meant for single-purpose storage, resulting in these facilities remaining idle for six months due to seasonality of the produce. An NCCD study in 2015 observed that **only 75% of the installed cold storage capacity is being utilized.**

Top 10 states in terms of the spatial spread of CS facilities / capacity in India:

Source: CBRE Research, Q4 2020; Public Information Bureau, 2017 and 2019

Total share of the top 10 states 91%
Current practices in India are focused on the creation of CS facilities, rather than the market linkages of products. For instance, most of the reefer freight in India is presently being used for transporting frozen / imported foods or pharmaceuticals, rather than home-grown fruits and vegetables. Thus, about 85% of CS operators in the country do not have adequate access to the requisite reefer freight services.

Components of cold chain infrastructure in India

**Pack houses**
Pack houses are an important component of the cold chain infrastructure; India currently houses about 250 pack houses.

Supply gap for pack houses in India - 99.6%.

**Ripening chambers**
A majority of ripening chambers in India are currently being used only to ripen mangoes and bananas.

Supply gap for ripening chambers in India - 91%.

**Reefer freight**
India’s current capacity of temperature-controlled vans (reefer freight) is about 4.2 million tonnes.

Supply gap for reefer freight vans in India - 85%.

Source: CBRE Research, Q4 2020; ASSOCHAM’s Cold Chain Technologies, Transforming Food Supply Chains, May 2017

While India is already focusing on creating CS facilities across states, there is a considerable lag in terms of other cold chain infrastructure such as pack houses, ripening chambers and reefer freight.
3. THE CS SEGMENT IN INDIA: A SNAPSHOT

Players in the Indian CS segment can be broadly classified under the following categories:

<table>
<thead>
<tr>
<th>PLAYER CATEGORY</th>
<th>PRIMARY SERVICES</th>
<th>TYPICAL SPACE TAKE-UP</th>
<th>TYPICAL SPACE USAGE</th>
<th>KEY PLAYERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS OPERATORS</td>
<td></td>
<td></td>
<td></td>
<td>Snowman Logistics, Coldman, Roshan Frozen &amp; Cold Storage, Crystal, Gubba Cold Storage, Coldex, Coldstar, Kelvin, Foodland, etc.</td>
</tr>
<tr>
<td>END-USERS / OWNER - OCCUPIERS</td>
<td></td>
<td></td>
<td></td>
<td>Amul, Bigbasket, Haldiram’s, Adani Agro, etc.</td>
</tr>
<tr>
<td>THIRD-PARTY LOGISTIC COMPANIES (3PL)</td>
<td></td>
<td></td>
<td></td>
<td>Parekh Integrated Services, Gati Kausar, etc.</td>
</tr>
<tr>
<td>DEVELOPERS AND INVESTORS</td>
<td></td>
<td></td>
<td></td>
<td>Warburg Pincus, Kintetsu World Express, Asia Climate Partners, etc.</td>
</tr>
</tbody>
</table>

Source: CBRE Research, Q4 2020; CBRE’s Asia Pacific Cold Storage, An Investor’s Guide, July 2019
Note: This snapshot only depicts the typical segments, services and space usage in India, which may vary on a case-to-case basis.
4. GOVERNMENT INITIATIVES TO PROPEL THE SECTOR

A timeline of the government initiatives to promote the CS segment

Pre-2009
• Section 80-IB of the Income Tax Act provides deductions in respect of profits from industrial undertakings related to cold chain. For the first 5 years, the deductions are at 100% and then at 25% for the next 5 years.
• Initiative to set up 40 Mega Food Parks in India launched; 13 of these parks are currently operational. These Mega Food Parks (page 11) include collection centers, central processing centers, cold chain infrastructure and 25-30 developed plots for food processing units.

2009
• Goods and Services Tax (GST) exemption for services related to agricultural produce announced.
• The Finance Act, 2016 has amended Section 35AD of the Act so as to reduce the income tax deduction from 150% to 100% in the case of a cold chain facility or a warehousing facility for storage of agricultural produce.
• The coveted ‘infrastructure status’ granted to the CS segment, thus making loans available under Priority Sector Lending (PSL) for the construction of CS facilities.

2009
• Excise duty for refrigerated containers reduced from 12.5% to 6.0%.
• Concessional custom duty of 5% for imported cold storage equipment under ‘Project Import Scheme’ benefit guidelines introduced.

2010
• 100% FDI permitted in CS under the automatic route.

2012
• CS facilities became eligible for External Commercial Borrowing (ECB), with the upper limit of USD 750 million / financial year.

2013
• Income tax deduction of up to 150% on investment in a CS facility.

2014
• Department of Agriculture and Cooperation to provide capital investment subsidy ranging from 35% to 50% of the cost of the project for developing CS infrastructure under integrated post-harvest management.

2016
• Excise duty for refrigerated containers reduced from 12.5% to 6.0%.
• Concessional custom duty of 5% for imported cold storage equipment under ‘Project Import Scheme’ benefit guidelines introduced.

2017
• The Draft National Logistics Policy (DNLP) plans to promote the CS segment in order to reduce agricultural waste to less than 5%. This includes identification of key initiatives, infrastructure enhancement and improvement of penetration rates of CS facilities.

2018
• Formalisation of the cold storage segment by commissioning National Bank for Agriculture and Rural Development (NABARD) to map and geo-tag agri-warehousing, CS and reefer van facilities announced in Union Budget 2020-21.

2019
• The central government introduced ‘TOP (Tomato-Onion-Potato) to Total’ in May 2020, providing 50% subsidy on transportation and storage facilities (including CS facilities) for perishable farm produce.
• Credit linked grant at 35% announced for micro food processing units for development of common infrastructure including CS facilities.

2020
• Credit linked grant at 35% announced for micro food processing units for development of common infrastructure including CS facilities.
• The central government launched ‘Agriculture Infrastructure Fund’ of USD 13.3 billion in August 2020 to catalyze the creation of post-harvest management infrastructure which includes CS facilities, collection centres, processing units, etc.

Cluster development focused
Investment drivers
Promotion of private player participation

Source: CBRE Research, Q4 2020; CBRE’s Asia Pacific Cold Storage, An Investor’s Guide, July 2019

13. Including CS units / CS chains designed to store agriculture produce / products, irrespective of their location, for food and agro-processing up to a limit of INR 100 crore per borrower
14. Status as on Nov, 2019 - Ministry of Commerce awaiting feedback from related departments on the draft policy
As mentioned in section 2, there is a huge gap in the cold chain infrastructure which highlights the untapped potential of this segment in India. On the other hand, over the recent years, increasing urbanisation and organised retail food processing and servicing sectors have been accelerating the demand for products that need an efficient cold chain. Following the COVID-19 outbreak, the demand is now being further fuelled by huge omni-channel distribution of F&G across tier I and tier II cities in the country. According to Unicommerce’s ‘E-Commerce Trends Report 2020’, the e-commerce sector has witnessed an order volume growth of 17% since the COVID-19 outbreak until June 2020. Consumer buying patterns and preferences have also changed significantly with categories such as healthcare and F&G seeing an exponential growth, given the rise in the number of first-time online shoppers.

We expect this trend to lead to a rise in private sector participation in the CS segment over the coming years.

Investments in the CS segment in India have usually been undertaken through four primary routes. However, as the segment becomes more organised, investors now have the option to explore other routes as well, as highlighted on the right:

<table>
<thead>
<tr>
<th>Current investment routes</th>
<th>Future potential investment routes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PARTNERSHIP</strong></td>
<td><strong>SALE-AND-LEASEBACK</strong></td>
</tr>
<tr>
<td>Joint venture between various players&lt;sup&gt;15&lt;/sup&gt;</td>
<td>After the CS facility is sold, it is leased back for a long duration by the investor / player&lt;sup&gt;15&lt;/sup&gt;</td>
</tr>
<tr>
<td>Co-investing with CS operators</td>
<td><strong>CONVERTING SEMI-INVESTMENT GRADE WAREHOUSES</strong></td>
</tr>
<tr>
<td><strong>ACQUISITION</strong></td>
<td><strong>BUILD-TO-SUIT (BTS)</strong></td>
</tr>
<tr>
<td>An investor/developer acquiring another player&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Customized facilities for large occupiers across various product categories</td>
</tr>
<tr>
<td><strong>BUILD-TO-SUIT (BTS)</strong></td>
<td><strong>CO-MINGLED FUNDS</strong></td>
</tr>
<tr>
<td>Customized facilities for large occupiers across various product categories</td>
<td>Investment in portfolios containing other assets including traditional warehouses, manufacturing units etc.</td>
</tr>
<tr>
<td><strong>CO-MINGLED FUNDS</strong></td>
<td><strong>CONVERTING SEMI-INVESTMENT GRADE WAREHOUSES</strong></td>
</tr>
<tr>
<td>Investment in portfolios containing other assets including traditional warehouses, manufacturing units etc.</td>
<td>Applicable for in-city locations where industrial land is limited</td>
</tr>
</tbody>
</table>

<sup>15</sup> Refer to page 7 for types of players

Source: CBRE Research, Q4 2020; CBRE’s Asia Pacific Cold Storage, An Investor’s Guide, July 2019
<table>
<thead>
<tr>
<th>YEAR</th>
<th>INVESTOR</th>
<th>PLAYER TYPE</th>
<th>INVESTMENT VALUE (USD MILLION)</th>
<th>INVESTMENT ROUTE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>Kintetsu World Express</td>
<td>3PL</td>
<td>37</td>
<td>Partnership</td>
<td>Joint venture with Gati for a 30% equity holding</td>
</tr>
<tr>
<td>2016</td>
<td>Asia Climate Partners</td>
<td>Investor</td>
<td>34</td>
<td>Partnership</td>
<td>Funding to ColdEx</td>
</tr>
<tr>
<td>2016</td>
<td>Warburg Pincus</td>
<td>Investor</td>
<td>125</td>
<td>Acquisition</td>
<td>Acquired Stellar Value Chain</td>
</tr>
<tr>
<td>2017</td>
<td>JM Baxi</td>
<td>3PL</td>
<td>70 – 80</td>
<td>Partnership</td>
<td>Plans to set up 7-8 CS facilities across India. These facilities will be managed by Coldman Logistics</td>
</tr>
<tr>
<td>2019</td>
<td>Hiranandani Developers / Investors</td>
<td>288</td>
<td>BTS</td>
<td></td>
<td>Plans to develop BTS industrial units and warehouses with CS facilities in the long term in Chennai. These would be spread over 288 acres for end-users and 3PL players; and would operate on a leasehold model</td>
</tr>
<tr>
<td>2019</td>
<td>PepsiCo End-user / Owner-occupier</td>
<td>74</td>
<td>BTS</td>
<td></td>
<td>Plans to set up a snack manufacturing plant in Uttar Pradesh</td>
</tr>
<tr>
<td>2019</td>
<td>Ancon Logistics</td>
<td>3PL</td>
<td>58</td>
<td>Partnership</td>
<td>Plans to set up 8-10 logistics parks with CS facilities on a public-private partnership (PPP) basis across Hyderabad, Bengaluru, Vishakhapatnam, Nagpur and Gurgaon over the next five years</td>
</tr>
<tr>
<td>2019</td>
<td>Adani Ports and SEZ</td>
<td>3PL</td>
<td>42</td>
<td>Partnership</td>
<td>Acquired 40.25% share in Snowman Logistics</td>
</tr>
<tr>
<td>2020</td>
<td>Snowman Logistics</td>
<td>CS Operator</td>
<td>8</td>
<td>BTS</td>
<td>Plans to set up new CS facilities in West Bengal and Tamil Nadu; also to double the capacity of CS facility in Andhra Pradesh</td>
</tr>
</tbody>
</table>

Source: Media articles; CBRE Research, Q4 2020
Mega Food Parks - catalyst for the CS segment

One of the chief initiatives undertaken by the government to reduce post-harvest loss was to develop Mega Food Parks, which aim to establish a robust food processing industry with efficient CS infrastructure. These 37 Mega Food Parks are currently at various stages of implementation / operation as mapped on the right:

- Currently housing occupiers undertaking CS / food processing operations
- Under construction

Source: CBRE Research, Q4 2020; Ministry of Food Processing Industries, August 2020

Distribution of Mega Food Parks in India
5. WHAT’S INHIBITING THE GROWTH OF THE CS SEGMENT IN INDIA?

Regardless of the aforementioned government initiatives and the growing global / domestic investment flow, the CS segment in India continues to face multiple challenges across the supply chain.

Major challenges prevailing across the Indian CS segment

Industry-level challenges:

1. Dominance of unorganised players
2. Insufficient training, skilling and awareness among farmers/labour/management about handling temperature-sensitive products
3. Lack of focus on the need for CS for products other than horticulture crops; focus of CS on single/bulk products such as onions, chillies and potatoes
4. Inadequate CS capacities in comparatively more humid southern states

WHAT’S THE SOLUTION?

A national scheme should be introduced that focuses on:

1. Attracting major global/domestic investors by:
   • Further relaxing investment norms
   • Clearing regulatory compliances
   • Introducing product-specific protocols
   • Providing single-window clearance for approvals

2. Improving skills through:
   • Training and skill development programmes
   • Focusing on tech-oriented training

3. Providing incentives for product-specific CS facilities, with specific focus on products sold via online retail channels

4. Need for a multi-chamber CS facility network to ensure year-round utilisation, especially closer to farms/referer freight grids

Source: CBRE Research, Q4 2020

16. A share of about 90% of total I&L segment, CARE Rating, 2018
1. Focus on **non-conventional / hybrid systems** for cold chain should be encouraged

2. Major initiatives such as Bharatmala Pariyojana, Sagarmala and Draft National Logistics Policy (DNLP) are expected to optimize logistics efficiencies and improve connectivity by promoting multi-modal infrastructure by increasing the share of railways and waterways in the I&L sector. Initiatives should be taken to provide **fail-safe back-up power lines** to ensure uninterrupted power supply.

### Infrastructure constraints:

<table>
<thead>
<tr>
<th>CHALLENGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Uneven distribution</strong> of CS facilities – A majority of CS facilities are currently located only at production points, creating an inefficient cold chain network</td>
</tr>
<tr>
<td>2. <strong>Lack of support infrastructure</strong> in remote cities including an effective transport system and constant power supply for CS facilities. Even with a power peak deficit of 0.8% in India, uninterrupted power is still an issue</td>
</tr>
</tbody>
</table>

### Other constraints:

<table>
<thead>
<tr>
<th>CHALLENGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Current inadequate standards / protocols</strong> for constructing / operating a CS facility in India</td>
</tr>
<tr>
<td>2. <strong>Funding constraints</strong> - Currently, NABARD is effectively limited to funding state / central government organisations</td>
</tr>
<tr>
<td>3. <strong>Lack of modern tech</strong> – A majority of the required equipment within cold chain infrastructure in India is currently imported, with limited indigenous production</td>
</tr>
</tbody>
</table>

### WHAT’S THE SOLUTION?

1. The government should come up with **comprehensive standards / protocols** more suitable for India’s topography

2. NABARD should be allowed to refinance banks / private sector entities as well. **Preferential interest rates** for funding cold chain and grant of priority lending status to the sector are a few measures that can be considered

3. **Increased R&D** investment which focuses on creating low-cost, indigenous equipment should be encouraged. Relaxation of custom duties applicable on post-project tech is also recommended

We expect that addressing these challenges through regular policy interventions would boost global investment in the CS segment, leading to increased regularisation and efficiency over the medium to long term.

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Source: CBRE Research, Q4 2020

17. www.poweremin.nic.in
18. Initiatives to develop highways and ports that focus on optimizing efficiency of freight and passenger movement across the country. This would be through development of economic corridors, inter corridors and feeder routes, as well as improving international road, coastal and port connectivity.
19. Aims to optimize the current modal mix of road (60%), rail (31%) and water (9%) in line with international benchmarks: road (25-30%), rail (50-55%) and water (20-25%) and promote development of multi-modal infrastructure.
The CS segment in India is expected to witness significant growth over the next few years on the back of a strong consumer and industrial base.

Present and future market drivers of the CS segment in India:

<table>
<thead>
<tr>
<th>KEY MARKET DRIVERS</th>
<th>2019</th>
<th>2023</th>
<th>IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population(^{20}) (in billion)</td>
<td>1.37</td>
<td>1.42</td>
<td>OFD revenues in India likely to grow by more than 60% by 2023.</td>
</tr>
<tr>
<td>% of population aged 15-64(^{22})</td>
<td>67.1</td>
<td>68.0</td>
<td>Increasing demand for OFD services likely to be driven by the growing preference for \textit{doorstep delivery} of products since the COVID-19 outbreak.</td>
</tr>
<tr>
<td>Revenue from Online Food Delivery (OFD)(^{23}) services (in USD billion)</td>
<td>7.7</td>
<td>12.5</td>
<td>The growing young and working-age population prefers healthier food options without preservatives, thus requiring CS facilities to ensure fresh delivery. Additionally, India culturally prefers \textit{fresh produce}, thereby further boosting the need for setting up CS facilities close to residential areas.</td>
</tr>
<tr>
<td>Value of the cloud kitchen industry(^{24}) (in USD billion)</td>
<td></td>
<td>1.05</td>
<td>Emergence of the \textit{cloud kitchen}(^{21}) concept also likely to boost demand for CS facilities.</td>
</tr>
</tbody>
</table>

Source: CBRE Research, Q4 2020

20. Oxford Economics, 2019  | 21. A food production unit with space allotted separately for preparing food. The food prepared in these kitchens can only be ordered through online applications such as Zomato or Swiggy in India.  
The above-mentioned drivers are expected to fuel the growth of the CS segment over the next few years. For instance, local grocery / kirana stores are becoming smarter and developing ways to deliver food / grocery, thus expanding the market for OFD services and consequently CS (refrigerated) facilities. In this age of digitisation and improved internet access, we expect the demand for OFD services in both rural and urban cities to grow.

Thus, we anticipate that the CS segment is likely to be concentrated in major urban metros in either a few strategic in-city locations or in peripheral areas in proximity to rural markets. Considering the vast untapped potential of the CS segment in the country, we expect that the unique consumer / industry-led factors in India would continue to attract the interest of leading players at large in the coming years.