Transforming warehouses: Achieving efficient and sustainable logistics for Viksit Bharat

September 2024

pwc

ASSOCHAM
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Foreword

The logistics and warehousing sectors are crucial in supporting the vision of Viksit Bharat by enhancing the efficiency of India's supply chain. For India to emerge as a developed nation, the seamless movement of goods across the country is imperative. Modernised logistics systems not only reduce costs but also improve delivery timelines, ensuring that products reach their markets on time. With India's growing population and expanding economic base, it is essential for the logistics and warehousing industry to ensure efficient storage and transportation of goods, to serve advanced industrial supplies.

The development of multi-modal logistics parks offers immense potential to enhance transport logistics, improve infrastructure and foster ease of doing business (EoDB). Standardising warehouses and related physical assets will be pivotal in ensuring global compatibility and competitiveness, driving the adoption of best practices across the industry. Government initiatives such as the National Logistics Policy, PM Gati Shakti National Master Plan and the development of multi-modal logistics parks (MMLPs) have been instrumental in enhancing the efficiency of India's logistics network. The role of Dedicated Freight Corridors (DFCs) is crucial and transformative in supporting booming infrastructure and expanding international trade. These policies aim to reduce logistics costs and improve operational efficiency, ensuring that India remains competitive on the global stage.

Technology and digitalisation are key factors driving the transformation of the logistics sector. The integration of artificial intelligence (AI), the internet of things (IoT), and blockchain into logistics management can greatly improve transparency, tracking and overall efficiency. The focus on green logistics and warehousing highlights the importance of implementing eco-friendly practices and embracing circular economy principles. As we transition to net zero emissions, we aim to spearhead sustainable supply chain strategies that ensure environmental responsibility, efficiency, and long-term viability, paving the way for a more resilient logistics ecosystem. Embracing these technologies aligns with the Government's Digital India initiative, enabling a digitally connected and streamlined logistics network.

ASSOCHAM and PwC have prepared this report which aims to identify the key factors that will drive growth in the logistics and warehousing sector and help achieve the planned targets for new India. The report will be presented at the National Conference on Logistics and Warehousing for Viksit Bharat. We hope that the report will prove useful to policymakers, industry leaders, academia and other stakeholders seeking to gain insights into the strategic roadmap for the future growth and development of the logistics and warehousing sector in India.

Deepak Sood
Secretary General
ASSOCHAM

Message

The logistics sector has made great strides in improving its performance and efficiency. Recognising the critical role of logistics, the Government of India introduced multiple initiatives such as the National Logistics Policy with and PM Gati Shakti - National Master Plan for Multi-modal Connectivity, and various states introduced their logistics-specific policies. These measures have led to India jumping 16 places over the last ten years to reach rank 38 out of 139 countries on the World Bank's Logistics Performance Index,[1] with a target of reaching 25 by the year 2030.[2]

Warehousing has been undergoing a transformation in the last ten years, changing from a largely unorganised and fragmented industry to a more evolving space. The expansion of India's warehousing sector has made the integration of innovation into business strategies increasingly essential to sustain a competitive edge. The sector is adopting innovations such as automation, data analytics and sustainable practices, positioning itself as a critical enabler of effective logistics and economic development as India's economy continues to grow at a steady pace. Grade A warehouses have witnessed a 20–25% compound annual growth rate (CAGR) in the last five years. Third-party logistics (3PL), e-commerce, manufacturing, retail and automotive have been the key user segments driving growth in Grade A warehousing.

Grade A warehousing in India is projected to grow at a substantial pace of 25–30% CAGR over the next five years, driven by a need for higher service levels, increasing complexity of operations, decreasing cost of automation and focus on cost optimisation. Warehouses are expected to make their way into Tier-2 and Tier-3 cities as a surge in demand is expected from these cities in the near future.[3] In terms of future trends, we expect that there would be a greater need for adaptability in warehouse operations, ensuring scalability by using intelligent automation as well as embedding sustainability in warehouse design and operations. Overall, the warehousing market is expected to see dynamic growth in India, playing a crucial role in the country's economic development and its integration into global supply chains.

Manish R Sharma
Partner and Sector Leader - Transport and Logistics, Infrastructure

1 https://pib.gov.in/PressReleasePage.aspx?PRID=2003541
2 https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1957407
3 https://economictimes.indiatimes.com/industry/services/property-/-cstruction/indias-grade-a-warehousing-supply-to-top-300-million-sq-ft-by-2025/articleshow/110963100.cms?from=mdr

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1. Growth potential of India's warehousing sector

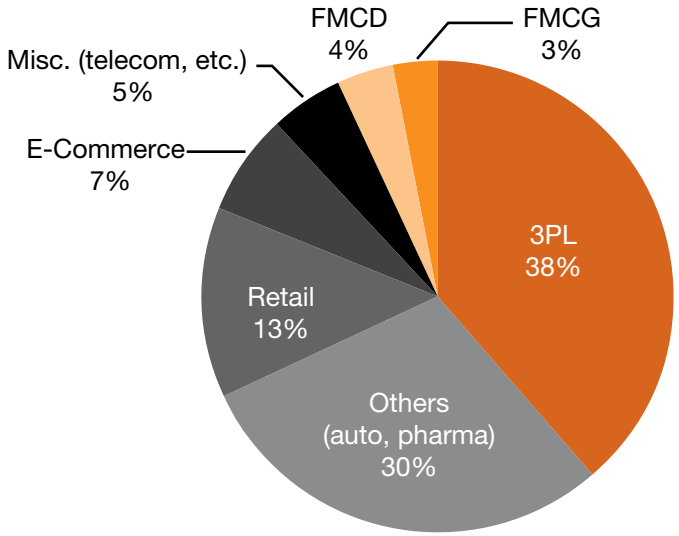
India's warehousing sector saw a turning point in 2017 with the implementation of the Goods and Services Tax (GST) as well as grant of infrastructure status to the logistics sector, including warehousing. This marked the start of a transformative phase in warehousing in India. With GST, efficiency offered by warehouse location became the decisive factor instead of tax considerations, paving the way for the development of larger fulfilment centres rather than small, fragmented warehouses. Thereafter, the COVID-19 pandemic significantly transformed warehousing as it accelerated the adoption of technology and reshaped operational priorities. Resilience and flexibility became key in supply chains during COVID-19 which led to a surge in automation, contactless operations, and real-time data and analytics to minimise disruptions. Apart from this, the growth of third-party logistics (3PL) services and the rapid adoption of e-commerce, alongside the expansion in manufacturing, have driven businesses to adopt modern and efficient warehousing facilities. This shift towards more well-organised, efficient and technologically advanced warehouses to manage the complex needs of consumers led to a compelling movement towards Grade A and B warehouses. While Grade A warehouses are equipped with additional floor load capacity, better planned spaces, safety precautions and adherence to international standards, Grade B and C have limited infrastructure capabilities.

On the supply side, the Grade A warehousing stock has increased by an additional 140 million sq ft[4] since 2016.

Grade B warehousing has also seen growth in both storage space and demand in the same period, driven by smaller businesses and firms. However, the pace of growth has not been the same as that for Grade A warehousing.

On the demand side, there has been a significant shift in the share of end-user groups for Grade -A warehousing, with the needs and preferences also evolving. The 3PL, retail, manufacturing and e-commerce sectors have shown significant growth during and post COVID-19 and have been the main drivers behind the need for efficient and technologically advanced warehouses to handle large volumes of goods, improve delivery turnaround times, cut costs, handle the expanding distribution network and provide flexibility in scale of operations – all of which have become very crucial following the pandemic.

Sector-wise demand for Grade A warehousing



Source: CNBC TV18[5]

Grade A warehouses typically offer certain specialised features

- High ceiling height of over 12 m
- Safety compliances
- Proper ventilation system
- Could be using technology, automation and mechanisation
- Proper planning and design of docks and internal roads
- Strong foundation and high strength flooring to withstand the cargo weight
- Sustainable building practices

4 https://www.investindia.gov.in/team-india-blogs/indias-warehousing-boom-how-automation-fuels-unprecedented-growth#:~:text=The%20country's%20Grade%2DA%20Warehousing,growing%20needs%20of%20various%20sectors.

5 CNBC TV 18: Mad about Markets: A Deep Dive Into Growth Of India's Warehousing Sector (2023)

There has been a rising trend of industries preferring to outsource their logistics requirements to 3PL players which have been one of the main generators of warehousing demand. The increasing need to prioritise core operations while taking advantage of scalability, flexibility and cost-efficiency offered by 3PL providers has been the primary driver for this shift. Moreover, the benefit of input tax credit on GST has also catalysed the consideration of manufacturers to use 3PL services.

The rise of e-commerce in India has also been a major contributor to the surge in demand for efficient storage and distribution centres. This has led to the proliferation of fulfilment centres (FCs) for e-commerce companies which play a crucial role in the supply chain by ensuring that products are picked, packed and shipped efficiently to meet customer demands. Flipkart, for instance, seems to have been expanding its network of FCs across various states, including Karnataka, Haryana and West Bengal, integrating advanced automation and robotics to enhance efficiency and accuracy in order fulfilment. Similarly, Amazon India appears to have increased its fulfilment and sortation centres, operating more than 60 centres across 15 states and covering over 20 million cubic feet of storage space. Distribution centres (DCs) are also playing a pivotal role in handling the distribution of products in e-commerce, acting as intermediaries between FCs and end consumers. E-commerce companies have established regional distribution hubs to streamline the flow of goods, ensuring quick transportation to local FCs or directly to customers.

Additionally, nowadays, quick commerce companies are also expanding rapidly, offering ultra-fast deliveries. To cater to the growing demand for quick commerce, these companies are strategically establishing dark stores at several locations in Tier-1 and Tier-2 cities. These dark stores, which operate as micro-FCs, are designed to optimise last-mile delivery efficiency, enabling companies to meet customer expectations for rapid delivery times while maintaining streamlined inventory management and order processing workflows

In future, the warehouse market in India is projected to grow at a substantial pace due to rapid industrialisation, increasing role of 3PL and e-commerce expansion. Increasing urbanisation will accelerate the need for Grade A warehouses in Tier-2 and Tier-3 cities. Overall, the warehousing market is expected to see dynamic growth in India and to play a crucial role in country's economic development and its integration into global supply chain.

Anil Syal,
President, Safexpress Pvt Ltd

'The Viksit Bharat vision aims at defining and elevating India to the status of a developed nation by the year 2047, through a collective strategy encompassing all sectors, with logistics and warehousing playing a crucial role. Early signs are quite encouraging, supported by policies such as GST and the National Logistics Policy, huge infrastructure investment, and an emphasis on skill and employment.
It is important to maintain the current cooperation between the Government and the logistics sphere to realise this ambitious goal.'

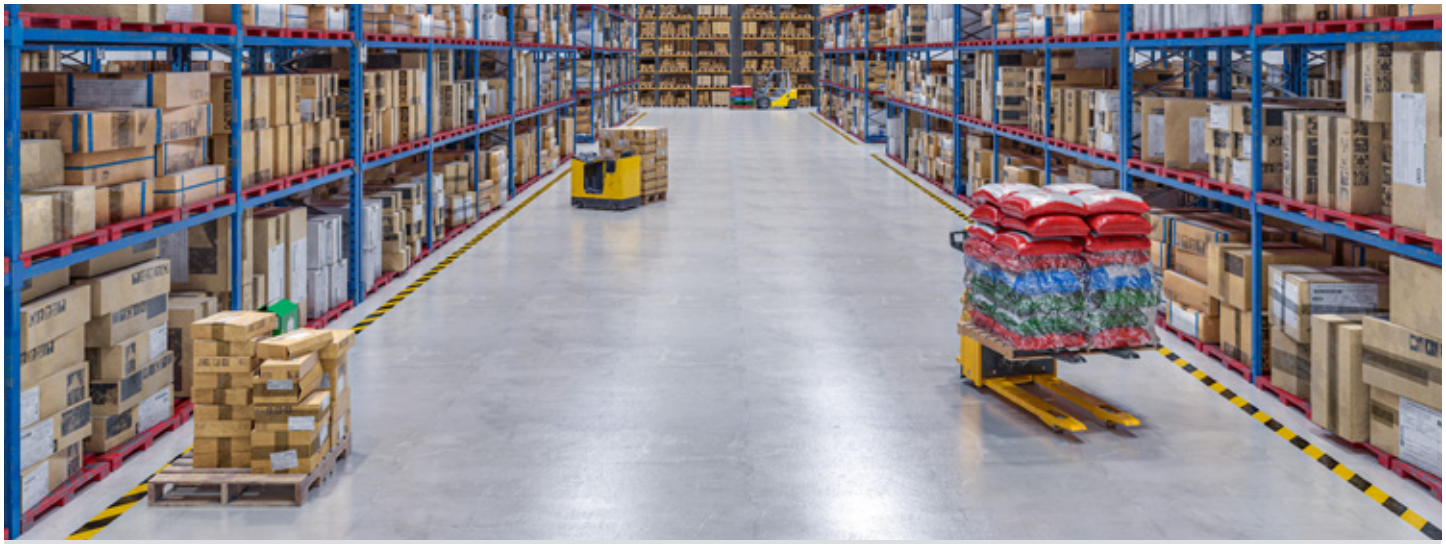
2. Warehouse technology-led transformation: A necessity of the future

The maturity of technology adoption in Indian warehouses varies significantly, influenced by factors such as organisational priorities, warehouse size, volume of inventory, throughput rates, complexity of inventory and supply chain complexity. In India, most warehouses fall within maturity levels 1 to 2 with an ongoing transition to levels 3 and 4, mainly driven by e-commerce, organised large retail chains, and FMCG sector players.

Maturity of technology adoption in the warehousing sector

Information flows			
Limited record keeping on paper trail	Largely digital flows	Fully digital information flows	Fully automated
Cargo flows			
Manual; non-mechanised material handling equipment (MHE)	Mechanised MHEs	Partial automation	Fully automated
• Mainly relies on **manual labour** for completing warehouse operations • Uses **non-mechanised MHEs,** leading to low productivity metrics such as throughput rates • **Low cost with low productivity** • Currently, most prevalent mode of operations; however, ongoing transition to semi-automatic mode	• **Introduces basic digital tools mainly targeted at information flows** such as bar codes for records management and digital exchange of information • **Cargo flows continue to be manual**	• **Information flows are fully automated** • **New interventions are targeted at cargo flows** – use of mechanised forklifts, light and voice-guided racking systems, etc. • **Parts of warehouse processes are automated, e.g. use of robotics depalletisation and sortation to automate inbound processes**	• **Fully automated warehouse operations** • Requirement of highly **skilled manpower** • **High upfront cost with very high productivity** • **Suitable for high throughput and large warehouses** such as distribution centres of retail chains

In the last decade, the Indian warehouses sector has gone through a transition as it largely moved from level 1 to level 2 of automation. The trend is expected to continue in the future with players moving towards level 3 driven by business needs such as service levels (e.g. throughput rates) and cost optimisation (e.g. storage per unit of land area).



The need for transformation through greater automation and digitalisation within the warehousing sector is due to the growing demand for efficiency, scalability, accuracy and cost effectiveness in the operations of a warehouse. As businesses handle larger volumes of goods with increasingly complex consumer demands, manual processes are slowly becoming insufficient and at times incapable of managing warehouse operations. Technology adoption in warehouses help address these needs and challenges by refining tasks, reducing costs associated with labour and operational inefficiency, increasing the capability of warehouses to handle larger volumes, and reducing human errors.

Key drivers for technology-led transformation

Challenges for warehouse operators	How automation addresses these challenges
Need for **higher service levels**	As the scale of a business grows larger, manual processes are generally found to be inadequate to keep up with the required service levels. Key performance indicators (KPIs) like throughput rates, accuracy rates and handling a diverse set of stock-keeping units (SKUs) can largely be improved only through technology adoption.
Focus on **cost optimisation**	Technology solutions such as automated storage and retrieval systems combined with warehouse management systems (WMS) with high density and deep racking can increase space utilisation by up to ten times compared to a manual warehouse,[6] reducing the need for land resources. In addition, technology interventions optimise manpower costs by helping improve productivity per employee. However, there is a need to carefully select the right level of technology adoption based on logistics process maturity, business needs and cost-benefit analysis to yield maximum benefits. (As explained in the next section)
Rapidly evolving business requires **adaptable and scalable warehouse operations**	Automation solutions and digitalisation help create flexible and modular systems that can adapt to growing demands. Such flexible systems allow warehouses to manage increased volumes and types of inventory without a proportional increase in operational costs.

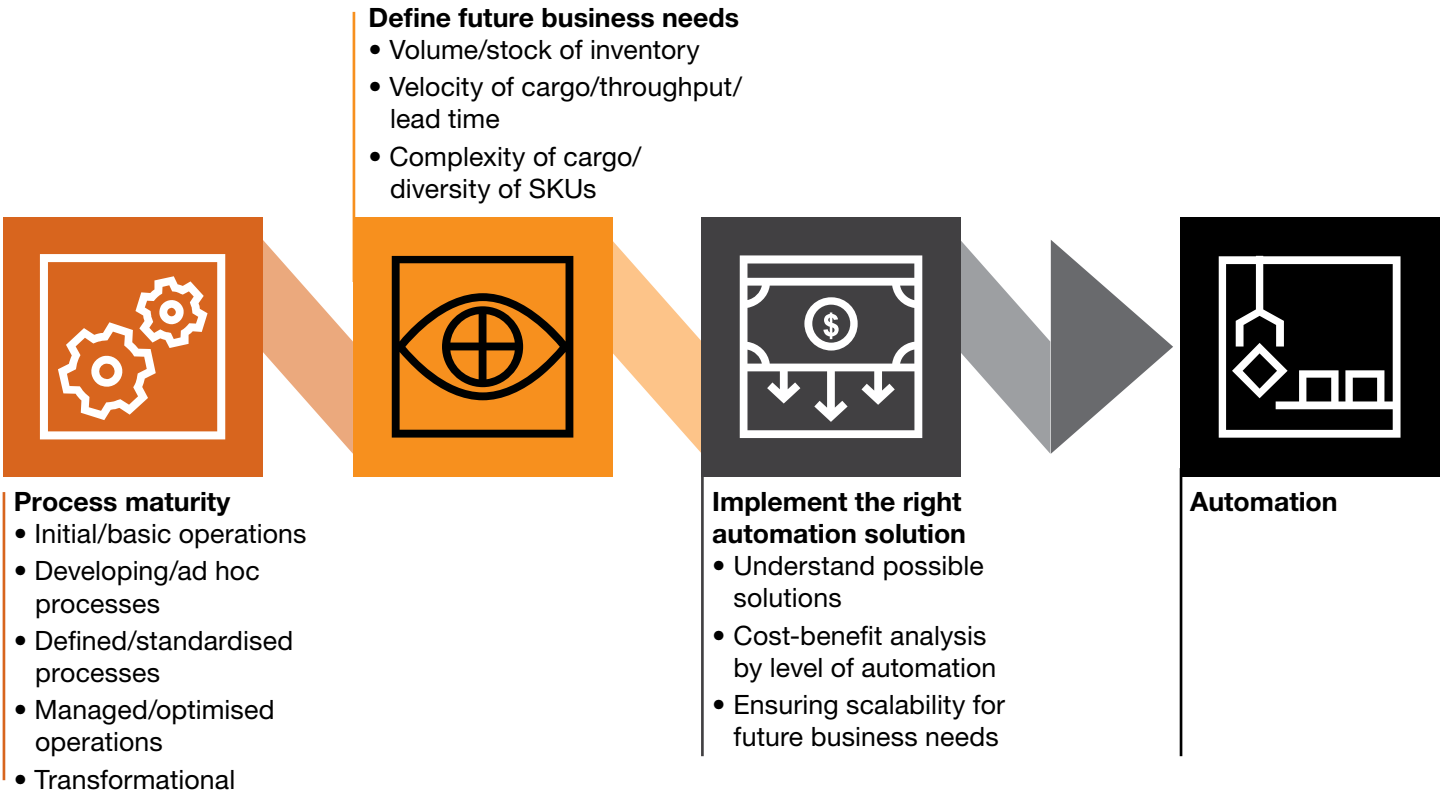
Today, warehouses in India are expected to be agile to tackle requirements such as large volumes and complex consumer demands. This would make digitalisation and automation essential for improving service quality, optimising space utilisation, and ensuring efficient human resource deployment. While the industry is largely on track to move from level 1 to level 2 of automation with basic digital interventions, evolving industry needs are expected to lead more players towards level 3 maturity. This shift would be driven by a focus on high efficiency and accuracy at optimised costs and effective utilisation of available land. As the sector continues to grow, it will be crucial for organisations to carefully consider various factors, including balancing the level of automation with the cost of such technological interventions.

6 PwC analysis and discussions with leading warehouse automation solutions providers

3. Embarking on the technology-led transformation journey

In today's supply chain landscape, logistics operations must continually adapt to improve efficiency, reduce costs and enhance service quality. Digitalisation and automation offer powerful solutions, but their success depends on understanding the current maturity of logistics processes and planning technology interventions based on future business needs, integration complexities and change management. Organisations need to work with technology solution providers to understand possible solutions and undertake a cost-benefit analysis to agree on the right level of automation and digitalisation across the warehouse process flow. By following a structured approach, they can transition smoothly to automated and digitalised operations, enhancing efficiency and driving a sustained competitive advantage.

Guiding framework for embarking on the technology-led transformation journey



Process maturity of logistics operations

Logistics process maturity broadly refers to the degree to which processes are executed uniformly by employees each time they are performed. There are five maturity levels defined on a spectrum starting from low maturity – i.e. 'initial/basic operations', where the organisation lacks standard operating procedures (SOPs) leading to dependence on working knowledge and past experiences of workers to complete a task – and then to high maturity – i.e. 'Transformational' rating where SOPs are fully integrated with advanced technology supported by a system of compliance that creates a culture of continuous improvement. As maturity increases, processes become more standardised, optimised and technology driven, leading to higher efficiency and uniformity in operations. Understanding the existing processes, level of compliance to SOPs and performance monitoring mechanisms ensures that planned technology intervention efforts are built on a solid foundation.

Logistics process maturity framework

Level 1 Initial/basic operations	Level 2 Developing/ad hoc processes	Level 3 Defined/standardised processes
Logistics **processes are based on working knowledge of the team and left to the discretion of workers.**	Basic warehouse operation with partially defined SOPs. This leads to a system of **high dependence on key individuals,** rather than process consistency.	**Warehouse SOPs are formally documented and standardised.** General awareness about SOPs and importance of compliance is good. However, there are limited **compliance monitoring** mechanisms.

Level 4 Managed/optimised operations	Level 5 Transformational
High operational efficiency through **consistent SOP adherence** and monitoring mechanisms to measure employee productivity using manual methods, and efforts are made to optimise processes.	Well-documented SOPs and organisation-wide compliance. **SOPs are fully integrated with technology; compliance is automated and monitored. A culture of process excellence** is cultivated.

Define future business needs

To understand future business needs, the focus should be on:

1. stock/inventory levels to ensure the warehouse can store current and forecasted volumes
2. velocity/throughput of cargo to understand how fast the goods need to move through the warehouse to meet customer expectations; and
3. evaluating the variety of products handled to ensure the digital and automation system can handle diverse SKUs efficiently.

This helps warehouse developers and operators in choosing suitable digital and automation solutions, ensuring that warehouse operations can enable sustainable business growth.

Agreeing on the most suitable digitalisation and automation solution

Selecting the appropriate digital and automation solutions involves a thorough understanding of the financial commitment needed for various levels of automation. The planned interventions should seek to improve cargo flows and inflows across the warehouse processes – from inbound to dispatch. This requires:

- understanding key pain points or gaps in current warehouse processes
- identifying the right combination of solutions that can address the gaps in operations
- estimating the required financial commitment
- projecting the return on investment through improved efficiency in terms of high throughput rates and storage capacity per unit of land area as well as qualitative factors such as reduced error rates and improved ergonomics.

It is critical to assess an organisation's preparedness, potential challenges, and overall fit to ensure the effective adoption of digitalisation and automation solutions.

Embarking on the automation journey requires meticulous planning. Before initiating this journey, it's essential to evaluate the organisation's readiness, including the technological infrastructure, skill sets of employees, and ability of warehouses to meet current and future business targets. Also, understanding potential challenges, such as complexities in integration and change management, is crucial for risk mitigation and ensuring a smooth transition. Taking these considerations into account, the organisation can better position itself for a successful automation and implementation process.

Anshul Singhal,
Chairman, ASSOCHAM Council on Logistics and Warehousing,
and Managing Director, Welspun One

'At the ASSOCHAM conference, we are setting the stage for a transformative journey in India's logistics and warehousing sector which is still at a nascent stage but is poised for significant growth. The increasing demand from e-retailers expanding into Tier-1 and Tier-2 cities, coupled with collaborations with logistics service providers, highlights the immense opportunities ahead. With the government's push for manufacturing through the Make in India initiative, we are seeing a surge in demand for warehousing and logistics services to support this growth.
India offers a prime opportunity for dynamic investment and development, but challenges such as land acquisition and the need for a more centralised industrial real estate system must be addressed. This summit will spotlight the strategic factors driving the sector forward. By focusing on sustainability, strategic investments, and supporting India's manufacturing push, we aim to provide the Indian industry with world-class logistics and industrial infrastructure, positioning the country as a key player in the global landscape logistics sphere to realise this ambitious goal.'

4. Green warehouses: Transforming the future of logistics

The warehousing facilities of Viksit Bharat will not just be efficient storage spaces but also examples of environmental responsibility. Sustainable warehousing in India now involves advanced technological and green practices to create centres of storage that lower the carbon footprint, reduce energy consumption and minimise wastage. While international players such as Skoda and Brenntag are bringing global sustainability practices to their Indian projects, the trend for sustainability is slowly but steadily picking up amongst Indian warehouse developers, with a few Indian players adopting sustainable warehouses.

Environmental benefits

- Reduced emissions
- Improved warehouse environment
- Reduced resource and energy footprint

Business benefits

- Savings in operational costs
- Availability of green financing
- Enhanced brand image
- Efficient equipment utilisation

Factors driving adoption of green warehouses in India

1. **Government subsidies:** The Government of India has set a target of achieving net zero by 2070, and logistics is one of the most important sectors that the Government is working on to achieve this target. In 2022, the Government launched multiple initiatives such as the National Logistics Policy, the Tamil Nadu Industrial Policy, 2021, which offer a subsidy up to 25% up to a limit of INR 1 crore for setting up infrastructure in industrial sheds and warehouses such as sustainable energy use, recycling of waste and water
2. **Planet conscious customers and investors:** Customers are demanding products which have sustainable supply chains, putting pressure on both manufacturers and 3PL to invest in environment-friendly infrastructure and technologies. As a result, developers benefit from an enhanced brand image, gain a competitive edge in the market and attract investors.
3. **Availability of green financing:** Organisations such as Small Industries Development Bank of India (SIDBI) provide loans at concessional interest rates to micro, small and medium enterprises (MSMEs)that are adopting energy-saving technologies. To avail these benefits, developers can present certifications from agencies such as the Indian Green Building Council (IGBC) and Excellence in Design for Greater Efficiencies (EDGE) for their warehouse. Organisations also have other options of raising finances through sustainability-linked loans and green bonds.
4. **Savings in operational costs:** In addition to the positive impact on the planet such as reducing the demand for virgin materials and reducing the waste generated, green initiatives also have a strong economic advantage over the lifecycle of a project. While the initial investment is costlier than that for conventional buildings, the savings in operations would lead to recovery of expenses in a few years.

Green warehouse case study from overseas

Massmart Distribution Centre, South Africa

The 54,000 sq m logistics hub, comprising mostly warehouse space, is located in Durban, South Africa and was developed keeping in mind international standards of LED lighting, low e-coated glass, reflective paint and solar photovoltaics. It achieved EDGE Advanced certification from GBCI in June 2020. Benefits include:

- energy savings (42%)
- water savings (27%)
- less embodied energy in materials (44%).

Green warehouse example from India

GMR Fulfillment Center, Hyderabad

The GMR Hyderabad Fulfillment Center spans 94,574.6 sq m, with 51,154 sq m allocated for warehousing. The facility features energy-efficient HVAC systems, LED lighting, roof insulation, and a solar PV system covering 60.5% of its electricity needs. The project received EDGE Advanced certification in September 2021. Benefits include:

- energy savings (77%)
- water savings (84%)
- less embodied energy in materials (70%)
- total annual CO2 savings (790 t).

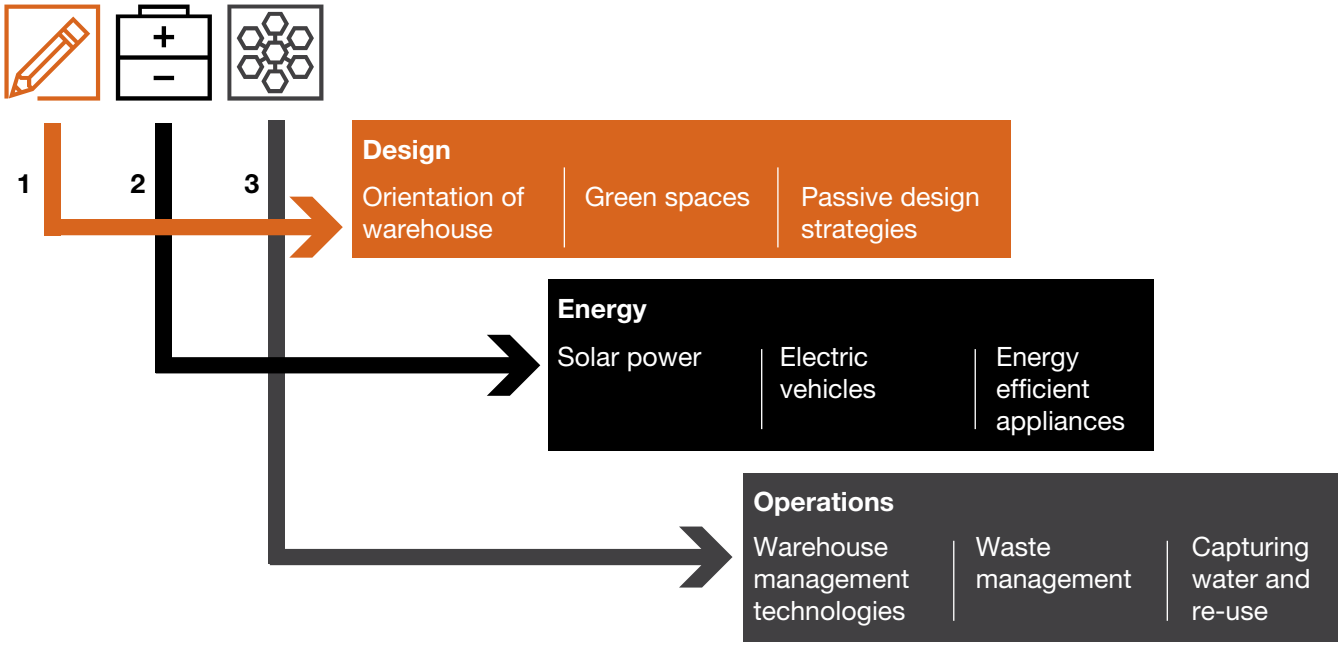
Source: Edge certificate case studies[7]

Varun Chopra,
Executive Chairman, GEAR India

'To achieve India's net zero target of 2070, each one of us has to strive in that direction with a high sense of urgency. I would propose to start with decarbonisation of supply chains, given that this accounts for 60% of all carbon emissions. One can take the first step towards net zero by transitioning to zero emission Replace with MHEs., which also provide a higher RoI and lower opex than IC and lead acid powered MHEs.'

Sustainability is best embedded in warehouses right from the design stage

Modification of brownfield operational warehouses to adopt sustainability principles can be very complicated because developers or tenants have limited options to choose from. They will not be able to change the embodied energy of the building materials or the orientation of the warehouse and implement other passive design principles. Including sustainable principles at the design stage helps in saving future costs and increases benefits over the life of the project.



7 https://edgebuildings.com/project-studies/

1. **Design:** While existing warehouses can be converted into green warehouses, it is advisable to start planning for green warehouses at the project inception stage to maximise benefits over the project service life.
    a. Orientation of warehouse: For minimising the costs of lighting and cooling, it is important to design the warehouse orientation such that it gets maximum sunlight and natural ventilation.
    b. Green spaces: With limited green space on the warehouse site, designers can also choose vertical gardens which will not only improve air quality but also keep the indoors cool, thus reducing the heat island effect.
    c. Passive design strategies: Designing warehouses to maximise natural light and air circulation could significantly improve the indoor conditions. Using sustainable materials such as bamboo, closed panel timber frames, glass wool for insulation and recycled steel, the embodied carbon and energy can be further reduced.
2. **Energy:** As warehouses do not require energy-intensive equipment, they can be powered by solar panels. By using energy-efficient equipment and switching to electric vehicles (EVs), the benefit will be compounded.
    a. Solar power: Most parts of India have close to 320 sunny days in a year,[8] and panels on warehouse roof can generate sufficient electricity for the operations while the surplus can be sold back to the grid.
    b. EVs: Switching to EVs from fossil fuel vehicles used in warehouse operations, such as forklifts, reach stackers, pallet jacks and other automated guided vehicles, can be an economical and sustainable solution. Traditional diesel or propane-powered forklifts can be replaced with electric models, which operate smoothly and silently and require little to no maintenance with zero tailpipe emissions.
    c. Energy-efficient appliances: Solutions such as efficient heating, ventilation and air conditioning (HVAC) systems, use of insulation materials, and optimising energy-intensive warehousing operations by scheduling energy-intensive operations during off peak hours to support the grid network and take advantage of lower energy rates.
3. **Operations:** A majority of emissions are released during the operations and maintenance stage of a warehouse's lifecycle. These are related to heating, cooling and waste.
    a. Warehouse management technologies: Using intelligent building management systems, which include a system of sensors that can assess the required temperature, light, water and air quality, the energy and resource requirements of warehouses can be optimised.
    b. Waste management: Green warehouses should implement a comprehensive waste management strategy with processes for segregating waste at the source, minimising waste through efficient packaging, promoting recycling and responsibly disposing waste materials.
    c. Capturing water and re-use: Freshwater demand and its associated costs for a warehouse can be reduced through rainwater harvesting and treatment of wastewater. This recycled and retreated water can be used for cooling tower make-up water, flushing and landscape irrigation.

The adoption of sustainable practices across the supply chain for warehouses would play a role in India achieving the goal of Viksit Bharat. Both the private sector and the Government would need to play key roles in this adoption of sustainable practices in warehouses. The Government would need to incentivise this transition, while the private sector would need to make the right investments.

Manuj Adlakha,
Co-Founder, Bootes Cold Chain Pvt Ltd

'Cold storage is essential in advancing India's net zero objective as it helps promote the adoption of renewable energy and sustainable practices, and significantly minimises emissions from food waste.'

8 https://eerem.delhi.gov.in/eerem/solar-energy#:~:text=Most%20parts%20of%20India%20have,total%20energy%20consumption%20per%20year

Road ahead

The Indian warehousing sector is at a pivotal juncture due to the evolving nature of service requirements in the post-COVID world. The rise of e-commerce, quick commerce and large-format organised retail chains, the emergence of large-scale manufacturing as a result of the Government's push for Atmanirbhar Bharat, and the need for high-quality warehousing and logistics services from 3PL players – have transformed the demand for warehousing services.

As businesses grapple with increasing volumes and the complexity of operations, the transition from manual to digitised and automated processes has become essential. Digitalisation and automation not only enhance efficiency and accuracy but also optimise space utilisation and reduce labour costs, which makes them critical components for modern warehouses.

Simultaneously, the adoption of green practices is gaining momentum, influenced by Government policies, investor pressure and consumer demand for environmentally responsible operations. Sustainable warehousing practices such as use of renewable energy sources, intelligent building management systems, waste management and water reuse are being considered. These practices not only reduce the environmental footprint but also offer strategic business benefits, including cost savings and compliance with ESG principles.

The future of warehousing in India lies in the seamless integration of advanced automation, digital technologies and sustainable practices. This transformation would require a thorough assessment and evaluation of the future business needs for well-informed planning and execution. By embracing these changes, the Indian warehousing sector can enhance its operational cost and efficiency and support the country's economic growth.

About ASSOCHAM

The Associated Chambers of Commerce & Industry of India (ASSOCHAM) is the country's oldest apex chamber. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations and regional chambers in its fold.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem.

With more than 100 national and regional sector councils, ASSOCHAM is an impactful representative of the Indian industry. These Councils are led by well-known industry leaders, academicians, economists and independent professionals. The Chamber focuses on aligning critical needs and interests of the industry with the growth aspirations of the nation.

ASSOCHAM is driving four strategic priorities - Sustainability, Empowerment, Entrepreneurship and Digitisation. The Chamber believes that affirmative action in these areas would help drive an inclusive and sustainable socio-economic growth for the country.

ASSOCHAM is working hand in hand with the government, regulators and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven 'Knowledge-Based Economy. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment.

The Chamber also supports civil society through citizenship programmes, to drive inclusive development. ASSOCHAM's member network leads initiatives in various segments such as empowerment, healthcare, education and skilling, hygiene, affirmative action, road safety, livelihood, life skills, sustainability, to name a few..

The Associated Chambers of Commerce and Industry of India

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