Amicus Growth Advisors

GREEN LOGISTICS

Logistics in harmony with nature







August 2024


Sustainibility in logistics is not a choice ;
It's a necessity for our planet's future

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Foreword

Dear Readers,

The logistics industry is a vital pillar of India's economic growth, yet it remains one of the most significant contributors to environmental degradation. As India continues to rise as a global economic power, the environmental impacts of logistics, such as carbon emissions, air pollution, and excessive resource consumption, pose a serious concern. The urgent need for sustainable practices within the industry cannot be overstated.

India has pledged its commitment to the **United Nations Sustainable Development Goals** (SDGs), particularly those related to climate action and environmental protection. These commitments underscore the necessity of transitioning towards Green Logistics—a concept that integrates environmental sustainability into the logistics sector. Green Logistics aims to minimize the ecological footprint of logistics operations while ensuring that businesses remain competitive and efficient. This approach is not only crucial for meeting India's SDG targets but also for safeguarding the future of the logistics industry in **a world increasingly focused on sustainability.**

The move towards Green Logistics is gaining momentum due to several factors in India. Rising fuel costs, stricter environmental regulations, and a growing consumer demand for eco-friendly products and services are pushing logistics providers to innovate and adopt greener practices. Alternative fuels such as biofuels, electric vehicles, CNG/ LNG and hydrogen fuel cells are emerging as viable options to reduce the sector's reliance on traditional fossil fuels. These alternatives, while initially requiring investment, offer significant long-term cost savings and business benefits. Companies that invest in these green technologies not only contribute to environmental conservation but also position themselves to **capitalize on new business opportunities** in a market increasingly driven by sustainability.



SANJEEV JAIN
Managing Partner
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Furthermore, the adoption of Green Logistics presents a unique **opportunity for Indian businesses to gain a competitive edge.** By aligning with the global shift towards sustainability, logistics providers can enhance their brand reputation, reduce operational costs, and tap into new markets that prioritize green solutions. The potential for cost savings, combined with the ability to attract environmentally conscious consumers, makes Green Logistics not just a necessity but a strategic business opportunity.

Our research report, on Green Logistics, aims to highlight the importance of **sustainable practices in the logistics industry**. We seek to raise awareness and provide actionable insights that will help logistics providers, policymakers, and businesses across India navigate the transition towards greener operations. As India advances towards a sustainable future, the logistics sector must lead by example, embracing innovation and sustainability to build a cleaner, greener tomorrow.

We trust that this report will serve as a valuable resource for all stakeholders committed to driving the green logistics movement in India.

Sanjeev Jain

Green Logistics: Pioneering the Future with High-Tech and Sustainability

"The future of transportation is sustainable. We must invest in greener logistics to ensure that future generations can thrive."

-Elon Musk



In today's eco-conscious world, green logistics is leading the charge for sustainability. As consumers increasingly favor companies that reduce their environmental impact, logistics firms are turning to digital advancements to create greener supply chains.

By harnessing the power of **Machine Learning, AI, Big Data, IoT, and Cloud Computing,** businesses are crafting logistics systems that are not just smart and efficient, but also kind to the planet. Let's dive into how these technologies are transforming logistics, starting with a clear definition of green logistics.

The Green Logistics Revolution: What It Means and Why It's Vital:

Green logistics includes any business practice that **minimizes the environmental impact of the logistics** network and delivery.

Sustainable logistics or green logistics secure a **strong bottom line without sacrificing customer satisfaction, or the well-being of the planet.** Intelligent businesses are rushing to understand and embrace sustainable logistics management, supported by powerful technologies such as artificial intelligence, machine learning, and advanced analytics.

As enterprises make the shift toward greener logistics, they realize benefits across the business, including improved profitability and good corporate citizenship.

But a primary driver is customer demand. As customers (both businesses and consumers) see the real-world results of climate change on newsfeeds and streaming channels daily, they are quickly shifting loyalties to companies that demonstrate significant, permanent steps toward a sustainable future. Customers (and shareholders) advocate for a circular supply chain that incorporates reverse logistics, and are not content with or influenced by **"greenwashing."**



A Journey from Awareness to Innovation

Early Roots (1960s-1980s)

Environmentally aware logistics are rooted in the worldwide environmental movement of the 1960s and 1970s. During this period, concerns about pollution, resource depletion, and the impact of industrial activities on the planet began to shape public discourse. The logistics industry, however, remained primarily focused on efficiency and cost reduction



Emergence of Environmental Awareness (1990s-2000s)



Environmental awareness reached new heights in the 1990s and early 2000s. Growing concerns over climate change and a shift in consumer attitudes prompted businesses to reevaluate their practices. During this period, they witnessed the first linkling of “green” practices in logistics, with a few pioneering companies exploring eco-friendly packaging and fuel-efficient transportation.

Regulatory Pressures (2010s)

The 2010s marked a turning point as governments began implementing stricter environmental regulations worldwide. The logistics industry is under increasing pressure to reduce carbon emissions contributing to climate change. This period saw the rise of sustainability certifications, incentivizing companies to adopt greener practices through market demand and regulatory compliance.



Corporate Commitments (2010s-Present)



In response to consumer expectations and regulatory pressures, significant corporations began making ambitious commitments to sustainability. Companies like Amazon, IKEA, and Walmart pledged to achieve carbon neutrality, sparking a wave of innovation in green logistics. The adoption of electric and hybrid vehicles, renewable energy in warehouses, and advancements in eco-friendly packaging became central themes in the logistics industry’s sustainability narrative.

Technological Advancements (2020s+)

The current decade has accelerated technological advancements shaping green logistics. Revolutionizing supply chain optimization with IoT, AI , and data analytics. Circular economy principles, emphasizing recycling and waste reduction, are gaining traction. The future promises a continued evolution of green logistics as businesses, governments, and consumers collaborate to create a more sustainable and resilient logistics ecosystem.



Core Pillars of Effective Green Logistics

To advance Green Logistics, companies need to integrate various sustainable practices into their operations. These key components are designed to reduce environmental impact and improve overall efficiency. Embracing these practices can help companies meet their sustainability goals and enhance their environmental stewardship. The essential areas to focus on include:



Sustainable Transportation

Low-emission vehicles
Optimized routing
Intermodal transport.

Sustainable Supply Chain Management

Collaboration with suppliers
Transparent and ethical sourcing
Encouraging sustainable practices

Energy-Efficient Warehousing

Efficient lighting and HVAC
Renewable energy use
Sustainable building practices

Waste Reduction and Recycling

Minimal, recyclable packaging
Effective waste management
Circular economy principles

Carbon Footprint Monitoring

Emissions tracking and reduction
Carbon offset programs
Continuous performance monitoring

Green Packaging

Eco-friendly materials
Minimal impact design
Reuse and recycling

Employee & Stakeholder Engagement

Sustainability training
Stakeholder collaboration
Customer involvement in initiatives

Reverse Logistics

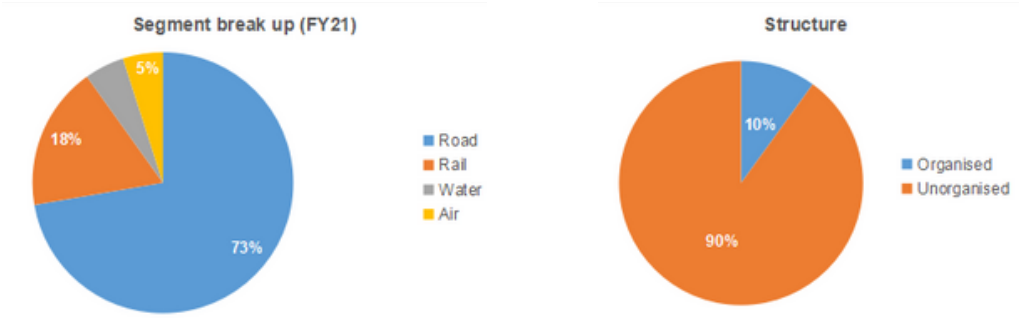
Efficient returns management
Product recycling and refurbishing
Responsible disposal

Sustainability Concerns in Conventional Logistics

India's Road-Heavy Logistics: A Carbon Footprint Catastrophe

According to the World Bank, transport-related emissions currently make up nearly 20% of global energy-related CO2 emissions, a number expected to increase by 60% by 2050 if not addressed.

In terms of transportation modes, the logistics sector in India relies predominantly on roads, accounting for a 73% market share, followed by rail (18%), water (5%) and air (4%). The below pie chart (right) represents the fragmented structure of the Indian logistics industry

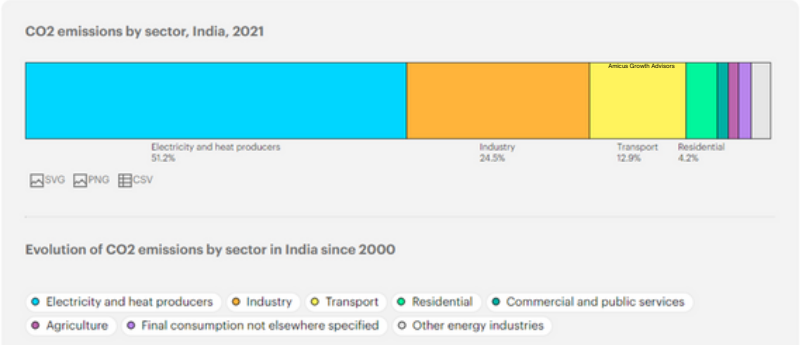


Source: KPMG Report

The transport sector of India is the third most greenhouse gas (GHG) emitting sector and accounted for **14 per cent of our energy-related CO2 emissions.** These emissions have more than **tripled** since 1990, and with India's urban population **expected to double** by **2050**, they are likely to increase further. The greenhouse gas emissions from the transport sector are growing at an alarming rate and urgent action is needed to deliver on the goals of the Hon'ble Prime Minister of achieving net-zero emissions by 2070.

Source: NITI Aayog

This chart shows the breakdown of total greenhouse gases by sector.



Source: International Energy Agency

When comparing the amount of emissions into the atmosphere, road transport is undoubtedly in the lead, its emissions in total ***exceed the emissions of the industrial enterprises by 6 times,*** *and railway transport by orders of magnitude*

> Air pollution is one of India's most pressing environmental challenges. Of the **50 most polluted cities** in the world, **35 are in India**. Reducing transport-related emissions would have direct public health benefits, given that a large share of emissions occurs in urban areas and close to the ground, directly affecting millions of people. Road transport currently accounts for **20-30% of urban air pollution**.

Rising Emissions Impact from Air Pollution

Today, the logistics industry is responsible for around a quarter of global carbon dioxide emissions. This share may rise up to **40% by 2050** unless strong actions are taken, according to the European Environment Agency. Transportation carbon footprint and other air pollutants produced by road transport and aviation not only contribute to the greenhouse effect and quick increase of the planet's temperature. They also have a more direct impact on human health, causing lung and cardiovascular diseases or even leading to premature deaths.



Logistics Sector Marine Hazards

Apart from air pollution, the logistics sector can also be a threat to water supplies around the world. Ships produce large amounts of wastewater and solid waste that are released into the oceans and contaminate ecosystems. The noise produced by the sea freight can travel long distances underwater and disorientate aquatic animals that rely on the sounds to travel and communicate. Big marine mammals also risk collision with fast-moving ships. Not to mention oil spill disasters that have devastating consequences for the ecosystems of oceans and sea coasts.



Unsustainable Resource Consumption

The logistics industry's consumption of non-renewable resources is another big challenge for the environment. This is particularly important when it comes to fuel. Even though electric vehicles are gaining momentum, large-scale logistics requiring cargo airplanes or container ships is still far from decarbonization. The transportation industry also consumes large amounts of packages, pallets, and containers, many of which are single-use and end up creating heaps of litter. The logistics industry's impact on the environment can be disastrous.



Integrating Sustainability into Logistics Operations

What does sustainability in logistics entail?

Logistics encompasses all the processes a business employs to move goods from their origin to the customer. This includes procurement, inventory management, distribution, warehousing, transportation, packaging, and risk management.

Sustainable logistics involves implementing strategies to **minimize the environmental impact** of these processes. This can be achieved through initiatives such as carbon offsetting, optimizing transport routes to reduce emissions, and transitioning to electric vehicles.

Looking to enhance logistics sustainability? Here are key strategies businesses can adopt

1	**Strategic Focus 1: Decarbonization** To decarbonize, measure your carbon footprint, partner with sustainable suppliers, use green logistics options like electric vehicles and SAF, communicate your efforts, and continually optimize your supply chain for sustainability.
2	**Strategic Focus 2: Green energy solutions** To adopt green energy solutions, choose a renewable energy supplier, install solar panels, seek energy grants, and implement energy-saving practices like turning off unused equipment.
3	**Strategic Focus 3: Reverse logistics** Implementing reverse logistics in green logistics involves returning goods from customers for recycling, repurposing, or resale. H&M's Garment Collecting Program exemplifies this by accepting unwanted clothing for resale or recycling, thereby reducing waste and supporting a circular economy.
4	**Strategic Focus 4: AI Innovations** Artificial intelligence enhances green logistics by enabling accurate demand forecasting, optimizing delivery routes to reduce fuel emissions, and identifying energy inefficiencies in warehouse operations. These applications help minimize waste, improve efficiency, and support sustainable practices.

KEY MARKET DRIVERS

Environmental Regulations: Stricter Policies to Reduce Carbon Footprints

Stricter environmental regulations are driving the adoption of green logistics by compelling companies to implement sustainable practices, such as using low-emission vehicles and eco-friendly packaging. Non-compliance risks penalties, making adherence essential as the demand for green logistics grows with tightening policies.

Corporate Social Responsibility: Prioritizing Sustainability in Business Operations

Corporate Social Responsibility (CSR) drives green logistics by aligning operations with stakeholder expectations for sustainability. Companies prioritizing CSR improve their brand reputation, attract eco-conscious consumers, and gain a competitive edge. Green logistics also enhances operational efficiency, reduces costs, and helps meet regulatory requirements, making it integral to CSR strategies in a market focused on environmental responsibility.

Rising Fuel Costs: Driving the Demand for Energy-Efficient Logistics Solutions

Rising fuel costs are pushing companies to adopt energy-efficient logistics solutions, such as electric and LNG-powered vehicles and optimized transportation routes, to reduce operational expenses. By decreasing reliance on traditional fossil fuels, businesses can mitigate the impact of fluctuating fuel prices and contribute to a lower carbon footprint. This financial pressure is accelerating the industry's shift toward green logistics practices.

Consumer Demand: Growing Preference for Sustainable Products and Services

Growing consumer demand for sustainable products and services is pushing companies to adopt green logistics practices. As environmentally conscious consumers increasingly prioritize sustainability, businesses are responding by implementing eco-friendly packaging, offering carbon-neutral delivery options, and reducing their overall environmental impact. This shift in consumer preferences is not just a niche trend but a mainstream expectation, driving companies to align their logistics operations with these values to enhance brand loyalty and remain competitive in the market.

Consumer Influence in Green Logistics

For supply chain businesses, a recent report revealed good and bad news: On the one hand, nearly **half of consumers polled** said that they felt the **responsibility for increasing sustainability fell on retailers and other corporations** (as opposed to individuals or governments). On the other, **70%** said that they'd be **willing to pay more for products that could boast a sustainable supply chain**. The upshot here is pretty straightforward: it's time to start investing in a greener supply chain, but smart businesses should be able to expect a return on that investment.

The **Last Mile** in green logistics is crucial, as it's the most **resource-intensive** part of the supply chain and offers significant opportunities to reduce carbon footprints. However, a key challenge is that while it's essential to reduce environmental impact, ensuring transparency for consumers about these efforts can be just as difficult as meeting delivery timelines.

Empowering Consumers: Unlocking the Impact of Green Logistics

Businesses can enhance transparency in green logistics by educating customers about their sustainability efforts and the broader environmental impact of the supply chain.
With many consumers expecting companies to take the lead in sustainability, businesses have the opportunity to position themselves as trusted advisors. By raising awareness about key contributors to carbon emissions and promoting sustainable options, companies can empower customers to make informed choices. Integrating this education across various channels, such as websites and customer communications, helps build trust and encourages consumer participation in creating a greener supply chain.

Keeping customers informed about your sustainability efforts empowers them to make eco-conscious choices. Transparent communication builds trust and actively engages customers in your green logistics goals. Here are key strategies to enhance customer influence through consistent communication.

Key Strategies to Leverage Customer Influence

Increase Transparency:
Provide real-time updates to customers on delivery progress, from scheduling to the driver's arrival.
Highlight sustainability efforts at each stage of the fulfillment process, making customers aware of how their choices contribute to greener logistics.

Minimize Redelivery and Inventory Waste:
Communicate effectively with customers to reduce the need for redeliveries and decrease warehouse inventory shrinkage.

Optimize Routes for Efficiency:
Use smart route optimization to reduce last-mile fuel consumption by up to 10%. Emphasize this efficiency to consumers as part of their sustainable experience.

Showcase End-to-End Visibility:
Demonstrate how full visibility in the last mile reduces wastage and lowers your carbon footprint, and communicate this impact to customers.

These strategies strengthen customer trust and collaboration, helping both your business and customers contribute to a sustainable future.

Sustainable Economic Growth & SDG

In **1987**, the **United Nations Brundtland Commission** defined sustainable developments as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Whether economic growth can be sustained while tackling climate change and staying within wider environmental limits is an area of ongoing debate. Different perspectives range from a view that economic growth is not bound by environmental limitations to one that suggests sustained economic growth is simply not compatible with environmental limitations.

Defining Economic Growth

How economic growth is defined in the first place is important when evaluating the extent to which it can run alongside efforts to tackle climate change.

Economic growth is typically measured as the rate of change in output, or, more specifically, in real gross domestic product (GDP). Real GDP is a **measure of the market value** of all final goods and services produced in the economy for a given year, adjusted for inflation, and is used as an indicator of material living standards in a given country.

However, these measurements omit the value of the natural environment to people, as well as other aspects of human wellbeing that are hard to measure and as a result **alternative measures of wellbeing** have been proposed.

Decoupling economic growth from greenhouse gas emissions

Since the Industrial Revolution, economic growth has been linked to rising greenhouse gas emissions. Transitioning to low-carbon energy sources can maintain or increase production levels while reducing emissions, potentially decoupling economic growth from emissions. If low-carbon energy becomes cheaper than fossil fuels, it could significantly lower the emissions intensity of GDP, enabling absolute decoupling..

The Sustainable Development Goals (SDG) 2030 Agenda

The Sustainable Development Goals are the **Blueprint to achieve a better and more sustainable future for all**. They address the global challenges we face, including those related to poverty, inequality, climate change, environmental degradation, peace and justice. The **17 Goals** are all interconnected, and in order to leave no one behind, it is important that we achieve them all by 2030.



Aligning SDG Targets with Green Logistics: Pathway to Sustainable Planetary Stewardship

The Sustainable Development Goals (SDGs) of Affordable and Clean Energy (Goal 7), Sustainable Cities and Communities (Goal 11), Responsible Consumption and Production (Goal 12), Climate Action (Goal 13), Life Below Water (Goal 14), and Life on Land (Goal 15) are pivotal in driving green logistics. These goals encourage cleaner energy use, sustainable urban planning, waste reduction, and minimized environmental impact across industries.

Green logistics, which emphasizes eco-friendly practices in transportation, distribution, and supply chain management, is crucial for achieving these SDGs. By focusing on these areas, we can protect the planet, preserve ecosystems, and ensure a sustainable future for all.



Affordable and Clean Energy

To ensure sustainable energy access for all by 2030, we must boost electrification, invest in renewable energy, enhance efficiency, expand infrastructure, and develop supportive policies, especially in developing countries.



Sustainable cities and Comunities

Green logistics supports the development of sustainable urban environments by reducing vehicle emissions, minimizing traffic congestion, and improving overall urban air quality, contributing to healthier and more resilient communities.



Responsible Consumption and production

Green logistics fosters responsible consumption by reducing waste and improving resource efficiency through optimized supply chains and practices like better packaging and efficient routing.



Climate action

Green logistics directly contributes to climate action by lowering carbon emissions through energy-efficient technologies, optimized routing, and the adoption of alternative fuels, aligning with global efforts to combat climate change



Life below water

Oceans, which cover 75% of Earth, are vital but threatened by pollution and acidification. Green logistics helps protect marine ecosystems by reducing pollution and hazardous waste from logistics operations.



Life on land

Green logistics supports terrestrial ecosystems by reducing land degradation and habitat destruction through optimized transportation routes and eco-friendly practices, thereby aiding in the conservation of biodiversity and natural habitats.



Partnership for the Goals

Achieving the 2030 Agenda requires strong global partnerships, resource mobilization, and collaboration across all sectors to ensure no one is left behind. This collective effort will drive sustainable development and help address global challenges .

Obstacles in Implementing Green Logistics Practices

Cost considerations

Implementing green logistics practices often involves significant upfront investment, which can be a deterrent for many companies. The adoption of sustainable transportation methods, such as electric vehicles (EVs), and the integration of eco-friendly packaging materials can entail higher initial costs compared to conventional alternatives.



Infrastructure Deficiencies



The lack of adequate infrastructure is a major barrier to the widespread adoption of green logistics. Sustainable transportation methods, such as EVs, require a network of charging stations, while bicycle-based logistics need safe and accessible bike lanes. In many regions, these essential infrastructure elements are either insufficient or entirely absent, making it difficult for companies to implement and scale green logistics operations.

Collaboration Gaps Among Stakeholders:

Effective green logistics depends on collaboration among all supply chain stakeholders, including suppliers, logistics providers, customers, and regulatory bodies. When these groups aren't aligned, sustainable practices can falter, leading to fragmented efforts and reduced impact. This misalignment often results in inefficiencies and higher costs, limiting the overall effectiveness of green logistics initiatives.



Technological and Operational Challenges:



Transitioning to green logistics often involves integrating new technologies, which can present operational challenges. For instance, the shift to electric or autonomous vehicles requires not only financial investment but also operational changes, such as retraining staff and adapting logistics processes. Furthermore, green logistics often demands the integration of advanced technologies like IoT for real-time tracking or AI for optimizing routes, which may require significant expertise and resources to implement effectively.

Accelerating Green Logistics: The Challenge of Speedy Deliveries

The global surge in e-commerce is driving a dramatic increase in package deliveries, with an anticipated 25,000 packages shipped every second by decade's end. This boom is contributing significantly to climate change, with major delivery firms like FedEx, UPS, and DHL emitting 92 million tons of greenhouse gases in 2022—equivalent to Greece's total emissions. As last-mile delivery demand is projected to rise 78% by 2030, the sector's carbon footprint is expected to grow unless substantial changes are made.

Company Pledges and Progress

- **Amazon**: Initially aimed to achieve zero carbon deliveries by 2030 but now targets carbon neutrality by 2040. Amazon is leading with 10,000 electric vans deployed by Rivian, aiming for 100,000 by 2030. Despite this, the shift to electric vehicles (EVs) will only cover 20-30% of deliveries due to overall business growth.
- **UPS**: Originally set a 12% reduction target in ground transportation emissions by 2025 but has since revised its goal to halving the climate footprint of each delivery by 2035. The company has faced challenges with EV supply and investments, such as its stake in troubled European startup Arrival SA.
- **FedEx**: Commits to eliminating or offsetting all emissions by 2040. However, with a 25% increase in emissions from 2017 to 2022 and over 200,000 trucks and 700 planes in its fleet, achieving this goal is daunting. FedEx aims for half of its new vehicles to be electric by 2025 but has struggled to meet this target, deploying over 1,000 EVs and reserving 2,000 more.

Barriers to Electrification

Despite some progress, several challenges hinder widespread adoption of electric delivery vehicles:

- **Cost**: Electric trucks are at least $20,000 more expensive than gasoline-powered ones. The cost of charging infrastructure can add an additional $5,000 per vehicle, escalating if upgrades are needed for utilities.
- **Infrastructure**: Developing the necessary charging infrastructure could take years and significant investment.

The transition to greener logistics requires accelerated efforts and significant investment in EVs and charging infrastructure. A combination of incentives and penalties might be necessary to drive faster progress and align industry practices with climate goals. Without such measures, the sector's emissions are likely to continue rising, countering individual company achievements.

Overcoming Barriers: Strategic Solutions for Green Logistics Success

Gradual, Incentivized, Circular Approach to Green Logistics

- **Adopt a Phased Implementation**: Companies can gradually transition to green logistics by adopting sustainable practices in stages, starting with the most cost-effective measures. This phased approach allows businesses to manage initial costs and see early benefits, which can fund further investments.
- **Leverage Incentives and Subsidies:** Actively explore government subsidies, tax breaks, and incentives to help offset the initial costs of adopting green technologies.
- **Promote Circular Economy Initiatives:** Implement circular economy practices like reusing and recycling materials to reduce waste and lower long-term costs, making initial investments in eco-friendly packaging more cost-effective.

Collaborate, Innovate, and Build Sustainable Infrastructure

- **Collaborate with Public and Private Entities:** Companies can partner with local governments and private entities to develop necessary infrastructure, such as EV charging stations or bike lanes. Joint initiatives can pool resources and share the burden of infrastructure development.
- **Invest in Alternative Solutions**:Where infrastructure is lacking, companies can explore alternative green logistics solutions like hybrid vehicles that don't rely solely on EV charging stations or decentralized micro-hubs to support last-mile delivery using bicycles..
- **Advocate for Policy Support:** Engage with policymakers to encourage the development of supportive regulations and incentives that promote sustainable infrastructure.

Align, Engage, and Drive Sustainable Collaboration

- **Develop Collaborative Frameworks:**Form cross-functional teams with all stakeholders (suppliers, logistics providers, customers) to align goals, improve communication, and coordinate green logistics efforts, ensuring seamless collaboration and shared accountability across the supply chain.
- **Create Shared Value Propositions**: Highlight the mutual benefits of green logistics—such as cost savings, efficiency, and reputation enhancement—to encourage stakeholder commitment.
- **Implement Supplier Engagement Programs:** Engage and educate suppliers on sustainability, providing them with the resources needed to adopt green practices, ensuring sustainability throughout the supply chain.

Tech-Powered Logistics: Training, Rollout, Optimization

- **Invest in Training and Strategic Planning:** Equip staff with necessary skills through targeted training and develop a comprehensive roadmap for phased technology integration, with contingency plans in place.
- **Phased Implementation and Partnerships:** Gradually roll out new technologies using pilot programs and collaborate with technology experts and industry leaders to ensure successful adoption and minimize disruptions.
- **Optimize and Secure Funding:** Use real-time monitoring and data analytics to continuously improve logistics processes, while exploring government incentives and allocating budget for ongoing technological investments.

Sustainable Transportation: Innovations and Strategies

Decarbonizing the transport sector is crucial to limit global warming to 1.5°C and achieve net-zero emissions by 2050. Sustainable transport seeks to cut environmental impact through new technologies and sector-specific solutions, creating a system that is safe, accessible, efficient, and beneficial to society while minimizing harm to the planet.

Road Transport and Electric Mobility: A Greener Future

In logistics, road transport is vital, with trucks making up a significant portion of journeys. Key innovations to cut emissions include ultra-efficient engines, biofuels, hydrogen fuel cells, and electric vehicles. Effective electric mobility in logistics requires robust infrastructure, including low-carbon power sources, smart grids, and fast-charging stations. These advancements enhance sustainability and operational efficiency.



Rail Transport: Enhancing Efficiency with Digital Technology

For logistics, rail transport, especially when powered by clean electricity, offers low environmental impact. Digital technology has improved efficiency, with tools like mobile apps providing real-time updates on schedules and routes. Technologies such as Automatic Train Operations are also automating processes, reducing errors and boosting efficiency.



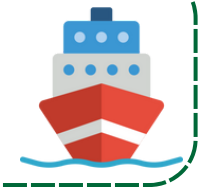
Aviation: Cutting Emissions in Air Travel

Aviation, which accounted for 2% of global emissions before the pandemic and growing by 4% annually, is seeing rising emissions again. Solutions include electrification for short-haul flights, mixed fuels blending kerosene with biofuels, and synthetic fuels made from CO2 and hydrogen. These innovations aim to reduce the carbon footprint of air transport.



Maritime Transport: Boosting Freight Efficiency

Maritime transport handles over 80% of global freight and contributed nearly 3% to global emissions in 2018. Efficiency improvements, such as real-time tracking systems for optimized routing and automated loading/unloading, can reduce fuel use and environmental impact, enhancing overall freight movement.



Smart Cities: Enhancing Urban Mobility with ITS

Smart cities use Intelligent Transport Systems (ITS) to improve urban mobility. ITS offers real-time traffic updates, optimizes routes, and provides data on train occupancy and freight transport, enhancing efficiency and sustainability in logistics.



Beyond Fossil Fuels: The Alternative Revolution

Commercial vehicles are currently responsible for about **one-third of greenhouse gas emissions** in the transportation sector. In particular, long-haul trucking, which is still predominantly diesel-powered, is a major source of CO2 emissions.

There is widespread agreement that the road transport of the future must be environmentally friendly. In concrete terms, this means that it should be associated with as few direct and indirect emissions as possible. The EU stipulates that greenhouse gas emissions from new heavy goods vehicles should be reduced by **45% from 2030, 65% from 2035 and 90% from 2040 compared to 2019 levels.**

Compressed Natural Gas (CNG)



CNG is made by compressing natural gas to less than one percent of its original volume, allowing it to replace diesel fuel. CNG vehicles are less polluting and more energy efficient than diesel engines. Using biogas from renewable sources can **reduce CO2 emissions by over 80%**. However, CNG vehicles require more fuel storage space, making them better suited for shorter delivery distances.

Liquefied natural gas (LNG)



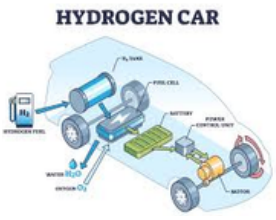
LNG, with its high energy density and much smaller volume than CNG, is produced by cooling natural gas **below -161°C**, reducing its volume by **600 times**. This makes it ideal for long-distance road freight, enabling trucks to meet current and future EU emission standards at low cost. Using biogas to produce LNG can also achieve emissions savings of around 80%, similar to CNG.

Electric Vehicles (EVs)



The adoption of electric vehicles in logistics is gaining momentum as technology advances and the charging infrastructure expands. EVs **produce zero tailpipe emissions,** making them a key player in reducing air pollution. Logistics companies can incorporate electric delivery vans and trucks into their fleets, taking advantage of the growing network of charging stations and government incentives for sustainable transportation.

Advancements in Hydrogen Fuel Cells



Hydrogen fuel cells represent another promising avenue for cleaner fuel in logistics. Vehicles powered by hydrogen fuel cells **emit only water vapor and heat as byproducts, contributing to zero-emission transportation.** Although the infrastructure for hydrogen fueling is currently limited, ongoing research and development are addressing these challenges, paving the way for a more widespread adoption of this technology in the logistics sector.

Alternative Distribution Networks and Green Logistics Solutions

Of course, making the switch to EVs and alternative fuels is probably the most significant change when it comes to greener logistics. However, as **McKinsey's Bernd Heid** points out "in an 'ecosystem scenario' in which both public and private players work together effectively, delivery emissions and congestion could be **reduced by 30%**...when compared to a 'do nothing' scenario". To achieve maximum cost efficiency, faster delivery speeds, and meaningful reductions in emissions and waste, businesses will need to consider more collaborative logistics methods, and a more sophisticated array of optimizations.

Additional Optimization Strategies

Load Pooling



A growing trend in optimised supply chain management sees similar (even competitive) companies working together to pool their warehouse and logistics resources. At first glance, this can seem like a challenging concept but fortunately, cloud-connected logistics management technologies are helping businesses to collaborate and cooperate with maximum visibility and control.

Unbranded parcel lockers:



Amazon pioneered the idea of neighbourhood parcel lockers to shorten routes and speed up delivery. This is highly effective but has tended to shut out the competition. Unbranded community parcel lockers function similarly to the existing Amazon locker networks, but are accessible to a much broader range of delivery providers. By making this resource more widely available, the major logistics providers can work together to save time and money and improve consumer choice.

Automated load optimization



This refers to coordinating items (held in warehouses and distribution centres) with similar delivery ETAs and destinations. With today's volumes, it's essentially impossible to achieve this via manual efforts but smart supply chain solutions can identify and automate vehicle loading, to help eliminate the costly practice of sending delivery vans out with only half a load.

Night -time delivery



The more time vehicles spend on the road, the greater the amount of fuel and energy used. Especially in urban areas, making deliveries at night can reduce road-time and congestion by **up to 15%**. Furthermore, with EVs being quieter, there is less risk of adding to night-time noise pollution.

On-demand micro-mobility networks



Micro-mobility refers to small often two-wheeled vehicles like electric scooters and e-bikes. Modern logistics technologies now give drivers easy access to cloud-connected apps. This means connectivity with the home base (dispatch) and the customer (delivery ETAs) in real time. By leveraging an on-demand network of independent drivers (not exclusively employed by any one business), companies are reaping significant savings in both fuel usage, and the cost of maintaining standing fleets.

Dynamic route allocation



In urban settings, cloud-connected route allocation tools can assess traffic, parking, even construction or other delays. In rural areas, other factors may be more relevant such as road and weather conditions, or distance from EV charging stations. By incorporating this kind of intel into real-time route planning, companies can increase delivery speed and minimise fuel consumption.

Drones and automated vehicles



It's visually compelling to think of drones crossing the skies and dropping packages like mechanized storks, or unmanned robots rolling down city sidewalks, laden with parcels. In reality though, we are still a few years away from fully automated logistics networks. But innovation is fast in this sector and digital automation is at the fore of many green solutions.

Sustainable Warehouses: Cleaner, Smarter, Greener

Energy-efficient warehousing is a critical aspect of pollution control measures within the logistics industry. Warehouses serve as central hubs where goods are stored, sorted, and processed before reaching their final destination. Adopting energy-efficient practices in warehousing not only **reduces operational costs** but also **minimizes the environmental impact** of logistics operations.

Energy-Efficient Warehousing and Pollution Control

• **Solar panels:** Warehouse owners can significantly lower their carbon footprint and reduce reliance on traditional energy by installing solar panels on the wide, flat roofs, enabling them to **meet up to 20% of their electricity requirements** from rooftop solar power.

• **High-efficiency lighting:** Adopting energy-efficient solutions such as LED lights can yield substantial savings, as they use **up to 90% less energy** compared to traditional industrial lighting and have an increased lifespan, reducing maintenance expenses

• **Roof insulation:** Warehouse energy efficiency can be enhanced with proper roof insulation, as it reduces the demand for excessive heating or cooling. Well-insulated roofs maintain stable temperatures, easing the workload on HVAC systems and minimising energy usage. Besides lowering carbon emissions, this approach leads to reduced maintenance and repair costs associated with HVAC systems.

• **Rainwater harvesting:** Rainwater harvesting systems in warehouses help conserve water resources and reduce reliance on other sources. Capturing and storing rainwater for non-potable uses such as landscaping and flushing can significantly reduce water consumption and associated costs. This practice is particularly effective in refrigerated warehousing facilities, where water conservation measures contribute to overall sustainability.

Did you know how many warehouse and distribution center projects are registered and certified under LEED?

*As of June 2024, there are **almost 7,060 LEED-certified** and registered warehouse and distribution center projects representing **over 2.6B square feet (244M square meters) of built space.***

Three recent LEED certified warehouse and distribution projects—in Missouri, New Jersey and Brazil—are setting a new standard for the industry, proving that it's not only possible to build more sustainable industrial projects, but that it can be done while simultaneously maintaining the most efficient operations.



Redefining Warehousing through Renewable Energy Innovations

India, a top contributor to global greenhouse gases, aims to cut emissions intensity by 45% by 2030. In response, green warehousing is growing, with eco-friendly packaging, energy-efficient transportation, and renewable energy usage redefining logistics. Efforts like green building certifications, energy efficiency improvements, and waste management strategies are driving this shift toward sustainable logistics.

Tech-Driven Shift to Green Warehousing in India

New-age technology is driving India's shift to green warehousing, aiming to reduce logistics costs from 14-18% of GDP to below 9%. Warehouses are adopting advanced systems like automated storage and retrieval systems (ASRS) and robotic material handling to boost efficiency and cut energy consumption.

The integration of solar panels, electric vehicles (EVs), and smart logistics solutions like route optimization and real-time tracking further enhances sustainability. Sensor-based lighting systems are also improving energy management, contributing to broader sustainability goals.



Warehouse with Solar Panel Roofs

Government Initiatives Propel Renewable Energy Growth

The government is actively promoting renewable energy through incentives and policies, notably the **National Solar Mission**, which seeks to position India as a global leader in solar energy. Financial support such as subsidies, tax breaks, and grants is available for businesses investing in solar power, enhancing its viability.

Additionally, certain states implement **Net Metering Policies**, allowing businesses to sell excess energy back to the grid, further increasing financial advantages. For warehouses, which often feature large, flat rooftops, solar panel installation presents significant cost-saving opportunities.

Logistics Sector Embraces ESG Principles for a Sustainable Future

Logistics sector occupiers and developers are increasingly embracing ESG principles, prioritizing sustainability through energy-efficient technologies, renewable energy sources, and sustainable materials in facility design and construction.

Modern warehousing parks are being developed to meet contemporary business needs while adhering to sustainability standards. The sector has shown resilience, especially during disruptions like the global pandemic, by adapting supply chain strategies and integrating technologies such as automation, solar panels, and sensor-based lighting. This focus on sustainability is leading to a more resilient, efficient, and greener future for the industry.

Corporate Giants Lead the Charge: Pioneering Solar-Powered Logistics and Green Technology Integration

has solarised more than 10 facilities spread across Maharashtra, Karnataka, Telangana, Madhya Pradesh, Haryana, and Punjab.

"We aim to enhance solar capacity by solarising an additional five locations in Bhiwandi, Nagpur, Bengaluru, Indore and Farukhnagar by next year," said **Sushil Kumar Rathi, director**, Allcargo Supply Chain. "This will add **500 kWp of solar capacity to our existing installed capacity of over 680 kWp.** The group's solarisation initiatives are a testament to its vision of achieving carbon neutrality by 2040."

targets 50% solar-powered EVs in logistics sector by end of FY25

The company aims to charge its electric fleet through the solar energy. “We are planning that 50% of the facilities this year will be solar powered and and by next year, whatever facilities that we are opening are 100% solar powered,” said Dhruv Bhatia, Co-founder and COO of Zevo India.

The company is also under the trial of bringing untapped temperature-controlled reirrigated delivery electric (REVs) vehicles.



Blackstone's logistics platform Horizon Industrial Parks has also taken steps in making rooftop solar power available at all operational parks. It has current operational and near-term planned capacity of **more than 25 MW across 12 operational parks and it plans to add at least 10 MW of solar capacity annually.**

"Currently, 20% of the total energy consumption requirements of the tenants at Horizon Industrial Parks is met by solar energy. We expect this to increase to 30-35% in the next 12-18 months, and our endeavor will be to increase it further, subject to favorable state-level renewable energy policies," said Urvish Rambhia, principal at Blackstone Real Estate India.

Announces Mega Plan in Line with PM Modi's Surya Ghar Scheme to Promote Sustainable, Renewable Energy

Tiger Logistics India has launched 'TiGreen,' a dedicated vertical focused on international logistics for the solar power and electric mobility sectors. This initiative supports India's renewable energy push, including the PM Surya Ghar scheme, expected to boost solar imports.

Additionally, Tiger Logistics has expanded its network across Cambodia, Malaysia, Vietnam, Thailand, and Hong Kong, key sources for importing solar panels to India. The company is collaborating with global organizations and SMEs to manage the import and export of solar modules and electric vehicles.

Packaging for the Planet: Green Logistics in Action

The Indian packaging market was valued at USD 50.5 billion in 2019 and is projected to reach USD 204.81 billion by 2025, with a CAGR of 26.7% from 2020-2025

Reusable Packaging Association (RPA) estimates reusable packaging can reduce supply chain environmental impact in the following ways:

- **Less solid waste**: Switching to reusable packaging significantly reduces solid waste, eliminating hundreds of single-use items and resulting in up to an **86% reduction in landfill waste.**
- **Lower CO2 emissions**: By adopting reusable packaging solutions, the need for recycling or remanufacturing is eliminated, leading to up to **60% decrease in CO2 emissions.**
- **Lower energy consumption**: Reusable packaging requires up to **64% less energy** to manufacture compared to single use alternatives.
- **Lower water consumption:** Reusable packaging uses up to **80% less water throughout its lifecycle** compared to single use options

Sustainable packaging is a crucial aspect of reducing waste generation and minimising the environmental impact of warehousing and supply chain logistics. Implementing sustainable packaging practices involves several key considerations:

Smart Packaging Strategies

Source reduction

Encouraging manufacturers and suppliers to adopt source reduction strategies helps minimise packaging waste. This includes optimising product sizes and using minimal packaging materials without compromising safety and integrity.

Reusable containers:

Promoting the use of returnable pallets and containers reduces reliance on single-use packaging. Establishing a well-organised system for retrieving and reusing these containers through reverse logistics enhances sustainability and waste reduction.

Biodegradable and compostable material

Embracing biodegradable and compostable packaging material, such as bio-based plastics and natural fibre-based products, reduces the environmental impact of packaging. These materials are designed to break down easily, contributing to a circular economy and reducing their presence in landfills.

"Over the last decade, packaging consumption in India has doubled, increasing from 4.3 kilograms per person per annum (PPPA) to 8.6 kg PPPA, as reported by the Indian Institute of Packaging (IIP)"

BLOCKCHAIN:
A Catalyst for Achieving Green Logistics Vision

Walmart harnesses Blockchain to Boost Supply Chain Transparency and Sustainability

Walmart is utilizing blockchain in conjunction with IoT devices such as **smart sensors and RFID tags** to enhance the transparency and traceability of its supply chain. By recording the real-time movement and condition of goods, Walmart optimizes routes, which helps in reducing fuel consumption and lowering greenhouse gas emissions. This initiative is part of Walmart's broader sustainability goals to become a more environmentally responsible company.

Nestlé employs Blockchain to Enhance Product Traceability and Sustainability Verification

Nestlé uses blockchain to provide comprehensive traceability of its products from raw materials to the end customer. By maintaining an immutable record on a decentralized ledger, stakeholders can access real-time information about product origins and eco-friendly practices. This technology helps Nestlé verify sustainable sourcing and production processes, reinforcing its commitment to reducing its environmental footprint and promoting sustainable consumption.



IBM MAERSK TRADELENS, transforms Global Supply Chain with Seamless Communication and Collaboration

The TradeLens platform, developed by IBM and Maersk, utilizes blockchain to improve communication and collaboration across the global supply chain. By sharing databases and eliminating intermediaries, smart contracts ensure the timely fulfillment of obligations, enhancing coordinated efforts to maintain green logistics practices and reduce greenhouse gas emissions.

Unilever drives Sustainable and Ethical Sourcing with Blockchain

Unilever leverages blockchain technology to verify and ensure sustainable and ethical sourcing of raw materials. By providing transparent information about the sourcing and production processes, Unilever meets consumer demand for ethical products and promotes the use of eco-friendly materials. This approach not only supports sustainability but also encourages suppliers to adopt greener practices, thereby contributing to lower greenhouse gas emissions across the supply chain

Globally, the adoption rate of blockchain technology is higher in shipping and transportation industry. In India, blockchain adoption is gradually increasing, especially as part of multiple government initiatives such as the Electronic Cargo Tracking System.

BIG DATA:
Fueling a Greener Logistics Future

Leverages Big Data with ORION to Optimize Routes, Reduce Fuel Use, and Cut Emissions

UPS implemented a route optimization system called ORION (On-Road Integrated Optimization and Navigation), which uses big data analytics to reduce the number of miles driven by their delivery trucks. By analyzing traffic patterns, delivery schedules, and other data points, UPS was able to cut down on fuel consumption and emissions.

Harnesses Big Data for Predictive Fleet Maintenance

DHL uses predictive maintenance strategies to minimize vehicle downtime and extend the lifespan of their fleet. By analyzing data from sensors on vehicles, DHL can predict when a vehicle is likely to need maintenance and address issues before they become serious, thus reducing the environmental impact of unexpected breakdowns.



Harnesses Big Data to Streamline Inventory, Slash Waste, and Minimize Carbon Footprint

Walmart utilizes big data analytics to optimize its inventory management. By accurately predicting demand, Walmart can reduce excess inventory, minimize storage needs, and decrease waste. This leads to more efficient use of resources and a reduction in the carbon footprint associated with overproduction and excess storage.

Utilizes Big Data for Real-Time Supply Chain Optimization

Maersk Line, a leading container shipping company, uses big data to gain end-to-end visibility of their supply chain. By tracking shipments in real-time and analyzing data from various sources, Maersk can optimize shipping routes, reduce idle times at ports, and improve fuel efficiency, thereby lowering emissions.

The adoption of this technology globally is significantly higher across all functions of logistics. In India, the emergence of logistics start-ups backing this technology is gradually transforming the unorganized transportation sector.
A report by NASSCOM (National Association of Software and Services) anticipates that India's big data analytics market will reach US$16b by 2025, which places it among the world's top 10 big data analytics market

CLOUD COMPUTING: Powering the Future of Green Logistics

Google Cloud Data Centers Pioneering Energy Efficiency and Carbon Neutrality

Google uses its cloud data centers, which are designed with the latest energy-efficient technologies. Advanced cooling systems and energy-efficient servers enable these data centers to operate at higher utilization rates, reducing energy consumption significantly compared to traditional on-premises data centers. As a result, Google has managed to achieve carbon neutrality since 2007 and aims to run entirely on carbon-free energy by 2030.

Revolutionizing Resource Efficiency and Driving Toward Carbon Negativity.

Microsoft has been a leader in using cloud computing to optimize resources. By shifting to Azure, companies can reduce their physical hardware needs, leading to less electronic waste and lower manufacturing resource demands. Microsoft continuously updates its infrastructure with the latest energy-efficient technology. This practice has helped them achieve their goal of being carbon negative by 2030, removing more carbon than they emit.



Leverages Cloud Analytics to Optimize Energy Use and Transportation

Amazon Web Services (AWS) employs cloud-based analytics to support sustainability. AWS enables companies to analyze large datasets to optimize transportation routes, thereby reducing fuel consumption and emissions. Amazon uses its cloud capabilities to track and reduce energy usage across its global operations, contributing to its goal of achieving net-zero carbon by 2040.

Transforming Remote Work While Pioneering a Path to Net-Zero Emissions.

Salesforce leverages cloud services to enhance remote work and digital collaboration, significantly cutting down on travel and commuting needs. By using Salesforce's cloud-based CRM and project management tools, businesses reduce the necessity for physical meetings and business travel. This shift has helped Salesforce advance its commitment to reaching 100% renewable energy for its global operations and achieving net-zero residual emissions by 2050.

Compared to other technologies, affordability of onboarding this technology is the primary reason behind its high adoption in the logistics industry. Numerous start-ups are implementing these solutions to support heavy operational processes at a relatively low price.

Electric Vehicles: A New Era in Sustainable Logistics

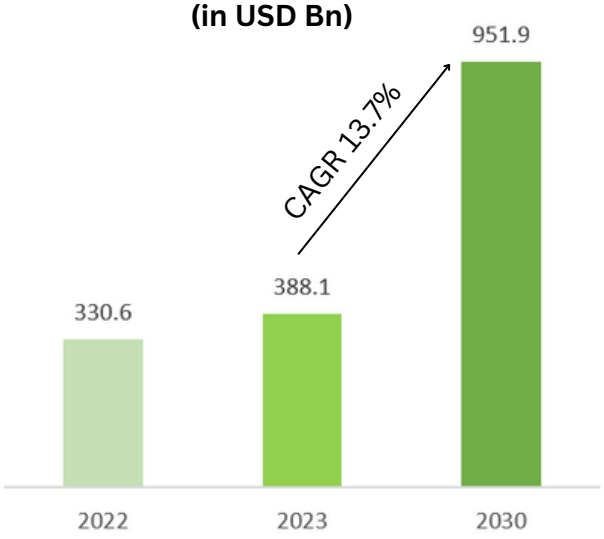
The **global** electric vehicle market, valued at **$388.1 billion in 2023** and projected to reach **$951.9 billion by 2030**, reflects a strong shift towards sustainable transportation. This growth, driven by technological advancements, environmental awareness, and supportive policies, aligns with green logistics goals. As EV adoption expands, it supports the logistics sector's move towards reducing carbon footprints and enhancing environmental sustainability.

India's electric vehicle market is projected to reach nearly **$114 billion by 2029**, growing at a **CAGR of 66.5%**. This rapid growth is driven by government support for sustainable mobility, increased VC investment, and strong consumer adoption.

The government's push for electric vehicles (EVs) is set to transform transportation and industries like modern warehousing. The government supports both EV manufacturing and charging infrastructure to promote widespread adoption of eco-friendly vehicles. The rise in EVs is set to transform the Indian automobile industry and drive demand for new storage, distribution, and logistics facilities.

Electric vehicles are ideal for logistics, especially last-mile delivery, due to their **maneuverability, low carbon footprint, and pollution-free operation**. They are effective in compact urban and indoor spaces, reducing carbon emissions significantly.

Global Electric Vehicle Mareket Size (in USD Bn)



Source: Markets and Markets

EVs offer significant environmental benefits by using renewable energy, producing zero tailpipe emissions, and reducing reliance on fossil fuels. As manufacturers increasingly use electricity from nuclear, hydro, solar, or wind sources, the carbon footprint of EV production continues to decrease.

EVs are highly efficient, converting over **77% of electrical energy into driving power compared to 12-30% for conventional ICE vehicles**. They use less energy in city traffic, operate smoothly and quietly, and reduce both noise and air pollution. Their performance and convenience make them ideal for high-priority courier services.

EVs are **more cost-effective** than ICE vehicles, with significantly lower fuel costs and cheaper charging. Their simpler mechanical systems reduce maintenance and operational expenses, eliminating the need for oil changes and reducing brake wear through regenerative braking. Overall, EVs offer **superior power and economic value.**

Technological Innovations: Surge in Adoption of EV

Global EV adoption accelerates with India leading the charge: Forecasts predict 5.9 million sales by 2040~ ET Auto

The falling cost of electric vehicles could lead to their faster adoption if the necessary support infrastructure is developed in parallel. Approximately one-third of the four-wheelers and half of the two-wheelers sold in 2030 could be electric, and could further increase to 75 per cent and 90 per cent, respectively, by 2050

The amount of CO2 that EVs can avoid will depend on the speed at which India decarbonises its power sector, which currently heavily relies on coal. Today, the tailpipe CO2 emissions that India's EV fleet avoids are roughly equal to the CO2 emissions that such vehicles indirectly cause at the power plant level. However, this is set to change in the future: **By 2030, India's EV fleet will avoid around 5 Mt CO2, while in 2050, the amount could range from 110 to 380 Mt CO2**, depending on the EV fleet size and the pace of power sector decarbonisation. EV deployment can also considerably reduce citizens' exposure to air pollution.

MoRTH has issued various advisories and notifications to encourage the adoption of electric vehicles. This includes granting exemptions from permits to battery-operated and ethanol/methanol-fuelled transport vehicles, incentivising EVs for shared mobility and public transport operations and exempting battery operated vehicles from certain fees related to registration



Automakers have recognized the demand for EVs and have introduced customized models to cater to the specific needs of logistics.

For instance, in January 2021, General Motors (GM) established a dedicated business unit to provide purpose-built EVs for delivery. These developments in the deployment of EVs in logistics, along with the support of major companies and automakers, indicate a strong driver for the green logistics market, that promotes sustainable logistics market and reduces emissions in the transportation sector.

In **2020**, **18% of DHL's vehicle fleet** comprised EVs for short distance and last mile services. However, **by 2030**, it aims to increase that proportion to **60% of worldwide delivery cars** for the last mile will be electric – resulting in over **80,000 electric vehicles** on the road. Hence, it is no surprise that it redefined logistics for a greener and more sustainable future. It is the first logistics business that has pledged to a zero-emissions target by 2050.

FedEx has set forth a commitment to incorporate EVs into its pickup and delivery vehicle fleet. The company aims to **achieve 25%** of its vehicle purchases as EVs **by 2025**, with a subsequent target of **100% EV** adoption by **2030**.

BluWheelz: Leading the Charge in India's EV Logistics Revolution

India's EV revolution is rapidly advancing, especially in commercial vehicles and two-wheelers. Among the new entrants is BluWheelz, a startup founded in January 2023. In just one year, BluWheelz has expanded to 17 cities, with a **fleet of 1,100 EVs** and over 40 clients, offering an **EV-as-a-service solution for the logistics sector**.

India's growing consumption is driving demand for distribution in sectors like FMCG, grocery, automotive, and infrastructure, boosting opportunities for new players. BluWheelz, founded by IIT graduate Sanjiv Gupta, leverages this trend with a focus on responsible distribution, with a background at Unilever, Coca-Cola, and SpiceXpress, is joined by logistics expert Chanpreet Singh Sethi and ex-banker Jaspreet Dhingra, bringing diverse expertise to the venture.

The surge in e-commerce and demand for faster delivery is reshaping India's logistics sector. Companies are increasingly adopting EVs for first- and last-mile operations due to their economic and environmental benefits. BluWheelz provides fleet-as-a-service solutions with EVs across various sectors, including **FMCG, Pharma, and food delivery**, on a monthly subscription basis. Their clients include major names like **Amazon, Flipkart, and Zomato**. Founder Sanjiv Gupta sees this model as a key opportunity to drive EV adoption and create entrepreneurial opportunities in logistics.

BluWheelz uses an **asset-light model, leasing vehicles** and covering costs for leases, drivers, and parking. They partner with Sun Mobility, Log9, and Charge Zone for vehicle and charging infrastructure. Plans include deploying 15,000 electric two-wheelers and 1,000 three-wheelers with Sun Mobility and adding 5,000 two-wheelers, 1,000 three-wheelers, and 500 four-wheelers with Log9.

BluWheelz plans to **expand into truck services for first-mile logistics** and support retrofitting internal combustion engine vehicles with electric motors and controllers. They have **partnered with Kalyani Powertrain** for heavy commercial vehicles and are collaborating with another major OEM for light commercial vehicles. Their goal is to become India's largest EV logistics company within the next two to three years.

The company **secured $1 million in bridge funding** from Venture Catalysts, with additional investments from FAAD, LetsVenture, and Chakra Growth Fund. The funds will be used to expand its EV fleet for logistics operations across India.

BluWheelz's low-cost franchise models, technology integration, and partnerships with OEMs like Eicher-Volvo and Tata Motors, along with strategic alliances for charging and parking, highlight its **commitment to green logistics** by improving efficiency, cost-effectiveness, and sustainability in transportation.





Leading EV Initiatives in India's Logistics Sector

amazon.in partners with Gentari to boost its EV fleet to 10,000 by 2025.

Gentari Green Mobility India has teamed up with Amazon to expand the e-commerce giant's electric vehicle (EV) fleet for last-mile deliveries, aiming to reach 10,000 units by 2025. This partnership will provide Amazon's delivery service partners access to more 3-wheeler EVs, supporting the company's goal to scale EV adoption across over 400 cities in India. Last year, Amazon India deployed over 7,200 EVs, and this collaboration is set to further accelerate its e-mobility efforts in the country.

magenta Mobility will deploy 500 EVs for last-mile deliveries from Bhiwandi's warehousing hub.

Magenta Mobility launched 'Project 302' with a new office and charging depot in Bhiwandi, deploying 500 EVs using the hub-and-spoke model. This move aligns with their vision to decarbonize logistics while expanding services to e-commerce, FMCG, and logistics sectors. Bhiwandi's robust infrastructure and strategic location make it an ideal hub for sustainable transportation solutions.



Magenta Mobility's EV Fleet

ZEVO is transforming India's logistics and supply chain sector with electrification efforts.

ZEVO is leading India's transportation sector toward a sustainable future with its comprehensive fleet of electric vehicles, ranging from two-wheelers to trucks. As a pioneering force in the electric vehicle revolution, ZEVO is reshaping logistics and supply chains across industries. Co-Founder & COO Dhruv Bhatia highlights the company's growth, strategic partnerships, and commitment to zero-emission solutions, positioning ZEVO as a key player in India's electric mobility landscape.

EVIFY India's first carbon-negative EV fleet operators

EVIFY, a tech-enabled startup providing green delivery services in Tier I, II, and III cities in India, has grown its fleet to over 350 vehicles in just 18 months in Surat and Ahmedabad. Using an asset-light model, EVIFY handles groceries, food, e-commerce, and hyper-local deliveries with low-maintenance, high-performance EVs. The company recently raised $200,000 in a seed funding round led by We Founder Circle, with participation from angel investors like Apurva Arora, Jayesh Gulabani, and Rajeev Mehta.



EVIFY carbon neutral EV Logistics Startup

In Conversation with Pentagon International Freight Solutions Pvt Ltd

Pentagon Freight X amicus

In our exploration of green logistics in the renewable energy sector, we interviewed the Chairman of Pentagon Freight, a leading freight forwarding company. Pentagon Freight plays a key role in supporting India's green energy initiatives by efficiently transporting raw materials required for the production of solar panels and other key components.

This interview offers insights into the company's strategies for overcoming logistical challenges, ensuring sustainability, and its vision for the future of renewable energy logistics in India, aligning with the themes of our green logistics report.



Mr. Paresh Bhanushali
Managing Director
Pentagon Freight

Can you describe Pentagon Freight's role in green logistics, particularly regarding solar panel production in India?

Pentagon Freight manages the logistics of raw materials needed to manufacture solar panels in India, ensuring their timely and efficient delivery. This supports the local production of solar panels and enhances India's green logistics framework & supports India's green energy infrastructure.

What challenges does Pentagon Freight face in the logistics of green energy, and how are you addressing them?

Key challenges include specialized handling and regulatory compliance. We address these by using advanced logistics technology, training staff in green practices, and partnering with regulatory bodies.

How does Pentagon Freight ensure sustainability in its operations?
Sustainability is at the core of our logistics operations. We optimize our supply chain to reduce carbon emissions, use eco-friendly packaging, and prioritize routes that minimize fuel consumption. By facilitating the import of electric vehicles (EVs) and components for renewable energy, we actively support the shift towards greener logistics solutions.

What role will Pentagon Freight play in India's renewable energy future?

We aim to be a leading logistics partner, scaling our operations to support large-scale solar and wind energy projects. We're also expanding our capabilities to assist in exporting finished goods made from the imported raw materials, reinforcing India's green logistics infrastructure.

Can you share any upcoming projects or initiatives that Pentagon Freight is involved in, aligning with the green logistics mission?

We are involved in key projects that support green logistics for solar and wind energy sectors across India. Additionally, we are expanding our international presence with branches in the Far East, Dubai, Kenya, and Vietnam, with plans to enter the USA and Saudi Arabia. These expansions underline our commitment to sustainable logistics.

In your opinion, what key factors will drive the success of green logistics in the renewable energy sector?

Success in green logistics will be driven by technological innovation to optimize operations, strong government support for sustainable practices, collaboration among logistics providers and energy producers, and a commitment to sustainability from all stakeholders.

Implementation of stringent environmental regulations

The implementation of stringent environmental standards and policies by governments and regulatory bodies worldwide has become a key driver of the green logistics market. These regulations cover various aspects of logistics operations, such as emissions control, waste management, energy efficiency, and sustainable sourcing. To comply with these regulations, logistic companies are adopting green practices and technologies in their operations. Improving logistics performance has become a crucial factor in effectively integrating into global value chains, sustaining economic growth, and boosting national competitiveness.

Recent instances highlight these efforts, for instance, in April 2023, the *U.S. Environmental Protection Agency* announced new exhaust emissions rules, which require **67% of new vehicles** registered in the U.S. to be all-electric **by 2032.**

In line with the *European Union regulations,* specific carbon emission guidelines have been implemented for different vehicle categories. These guidelines require a **15% reduction** in carbon emissions for new cars and vans **by 2025**, relative to the levels recorded in 2021.

Furthermore, a target of **55% reduction for cars** and **50% reduction for vans** by 2030 has been set, with the ultimate aim of achieving a 100% reduction in emissions by 2035.

With growing global environmental concerns, companies and policymakers are facing high pressure to reduce the negative ecological impact of logistics activities and make them more e**nvironmentally sustainable.**

Asia-Pacific is further investing in green supply market projects. For instance, India is committed to reduce emission intensity by **45% by 2030** and achieve net-zero emissions by **2070**. This commitment is **supported by $4,200 million (Rs 35,000 crore)** capital investment for energy transition, thus supporting the green logistics industry to reduce its environmental impact and embrace green mobility.

Moreover, logistic companies are bound to adopt green practices and technologies to comply with these regulations and contribute to global sustainability efforts. Thus, these efforts from various governments significantly contribute toward the growth of the global green logistics market.



International and Local regulations

Multi-Modal Logistics Parks

Development of MMLPs objective is to bring the logistics cost down. In India **about 50%** of the logistics cost lies in transportation, currently relying on roadways, which is expensive and time-consuming. A gradual **shift from road to rail** can bring down the transportation cost **by 45%** and travel time **by 50%.**

MMLP outcomes and benefits

Reduced Transportation Costs

•Logistics parks would provide a **10% reduction** in transportation costs for the top 15 nodes

• It will improve the inter-fleet mix by enabling freight movement on higher sized trucks and rails

Reduction in CO2 emissions

• Increased freight movement by larger sized trucks and rail will enable **12% reduction** in CO2 emissions for top 15 nodes

• Freight movement by rail has **65% less CO2 emission** compared to **road freight on a per ton per km basis**

Congestion reduction

Increased freight movement on higher-sized trucks and rails will result in a **~20% reduction** in freight vehicles catering to the demands of the top 15 nodes, significantly contributing to green logistics by lowering fuel consumption and reducing carbon emissions.



Environmental Protection Agency (EPA)

The EPA is addressing climate change by reducing GHG emissions from the transportation sector. These actions not only cut carbon but also decrease fuel consumption, reducing dependence on foreign oil and saving consumers money.

Setting GHG Emissions Standards for Cars and Trucks

Environmental Protection Agency (EPA) and Department of Telecommunications (DOT) issued a joint rule-making that set GHG emissions and fuel economy standards for the largest sources of greenhouse gases from transportation, including cars, light trucks, and heavy-duty trucks.

Light-duty GHG regulations for passenger vehicles and trucks are projected to:

- Cut **6 billion metric tons of GHG emissions** over the lifetimes of the vehicles sold in model years 2012-2025 and allowing manufacturers flexibility in meeting the standards;
- Nearly double the fuel efficiency while protecting consumer choice; and
- Reduce America's dependence on oil and provide significant savings for consumers at the pump.

Heavy-duty GHG regulations are projected to:

- Reduce **CO2 emissions by about 270 million metric tons** over the life of vehicles built under the program, saving about 530 million barrels of oil; and
- The proposed "Phase 2" program includes standards that would further reduce GHG emissions and improve the fuel efficiency of medium and heavy-duty trucks.

The Paris Agreement

The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well **below 2 degrees** Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further **to 1.5 degrees Celsius.**

For the first time, global warming has exceeded 1.5C across an entire year, according to the EU's climate service.

What did the Paris Agreement say?

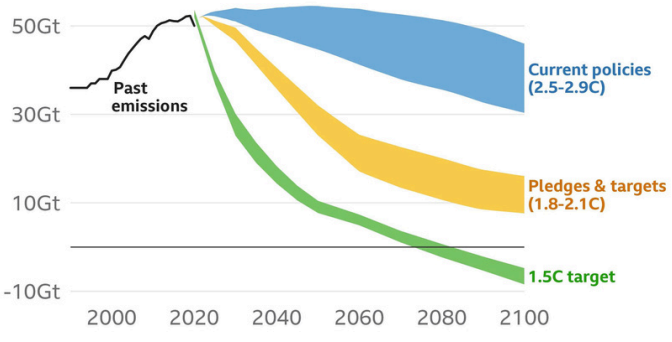
The agreement lists a series of commitments:

- To "pursue efforts" to limit global temperature rises to **1.5C**, and to keep them **"well below" 2.0C** above those recorded in pre-industrial times
- To **limit greenhouse gas emissions** from human activity to the same levels that trees, soil and oceans can absorb naturally known-as **net zero between 2050 and 2100**
- Each country to set its own emission-reduction targets, reviewed every five years to **raise ambitions**
- Richer countries to help poorer nations by providing funding, known as **climate finance**, to adapt to climate change and switch to renewable energy

The **1.5C target** is generally accepted to mean a **20 year average**, rather than a single year.

How close is the world to its 1.5C target?

Projected greenhouse gas emissions and future warming levels vary by actions taken



Emissions measured in gigatonnes of carbon dioxide equivalent

Why does keeping global warming to 1.5C matter?

Scientists say that every 0.1C of temperature increase brings with it greater risks for the planet - longer heatwaves, more intense storms and wildfires.

The 1.5C target was agreed because there is very strong evidence that the impacts would become much more extreme as the world gets closer to 2C. Some changes could become irreversible.

The science is not completely certain, but the **consequences of 2C global warming versus 1.5C, external** could be:

- Extreme hot days would be on average 4C warmer at mid-latitudes (regions outside the poles and tropics), versus 3C at 1.5C
- Sea-level rise would be 0.1m higher than at 1.5C, exposing up to 10 million more people to more frequent flooding
- More than 99% of coral reefs would be lost, compared with 70-90% at 1.5C

India is one of the few countries on track to achieve its Nationally Determined Contributions under the Paris Agreement, having already achieved 21 per cent of its pledge to reduce emissions intensity of GDP by 33-35 per cent by 2030. In fact, it is just two per cent short of the 2030 target of 40 per cent of installed non-fossil fuel electricity capacity

GOVERNMENT INITIATIVES

Bharatmala Pariyojana

The Government of India launched "Bharatmala Pariyojana" in 2017, a new umbrella program for the highways sector that focuses on optimizing the efficiency of road traffic movement across the country by bridging critical infrastructure gaps. The project covering a whopping **34,800 km** of the road would be completed in a phased manner

. • Under the Bharatmala **Phase-I**, a total of 34,800 kms of highway is to be constructed **(24,800 km through Bharatmala** and **10,000 km through National highways development project (NHDP))**
•The first phase was scheduled from 2017 to 2022 and work on phase 2 was to be **completed by 2028.**

Bharatmala Pariyojana is a significant infrastructure project initiated by the Government of India, aiming to enhance the country's highway network. Beyond its primary goal of optimizing road traffic efficiency, the project also contributes significantly to green logistics.

Here's how the government is helping achieve green logistics through Bharatmala Pariyojana:

Reduction in Fuel Consumption

- **Efficient Routes**: By constructing new highways and improving existing ones, Bharatmala Pariyojana helps in reducing travel distances and times. This efficiency translates to less fuel consumption for vehicles, contributing to lower greenhouse gas emissions.
- **Bypass Roads:** Creation of bypass roads around congested urban areas helps in reducing idling and stop-and-go traffic, further conserving fuel.

Integrated Multi-Modal Logistics Parks
Centralized Logistics: Bharatmala Pariyojana includes the development of MMLPs which act as hubs where different modes of transport like road, rail, and waterways converge. This integration minimizes the need for long road hauls and encourages the use of rail and waterways, which are more environmentally friendly.

Efficient Freight Movement
Dedicated Freight Corridors: The project includes dedicated freight corridors that facilitate faster and more efficient movement of goods. These corridors are designed to handle large volumes of freight, reducing the need for multiple smaller trips, which are less efficient.



BHARATMALA
ROAD TO PROSPERITY

Sagarmala

Sagarmala Programme for port-led development comprises **1,537 projects and the capital expenditure outlay of US$81b (INR 6.5 Lac cr.**) by GOI. The program will modernize existing ports, set up new mega ports, and establish Coastal Economic Zones and Units. The prime objective of the Sagarmala project is to promote port-led direct and indirect development and to provide infrastructure to transport goods to and from ports quickly, efficiently and cost-effective.

Sagarmala Project Vision T**o reduce logistics cost for both domestic and EXIM cargo with optimized infrastructure investment.** Sagarmala aspires to reduce logistics costs for EXIM and domestic cargo leading to overall cost savings of **~US$5b (INR 35,000 to 40,000 cr.)** per annum

By enhancing port infrastructure, setting up new mega ports, and establishing Coastal Economic Zones and Units, the Sagarmala project significantly contributes to green logistics in several w**ays:**

Reduction in Logistics Costs and Emissions

- **Efficient Cargo Movement:** By modernizing ports and improving the efficiency of cargo movement, the Sagarmala Programme aims to reduce logistics costs. Efficient ports lead to faster turnaround times for ships, reducing fuel consumption and emissions.
- **Direct Port Delivery (DPD) and Direct Port Entry (DPE):** These initiatives reduce dwell time and congestion at ports, leading to lower emissions from idling trucks and equipment.

Modal Shift from Road to Coastal and Inland Waterways-

- **Coastal Shipping:** The program encourages the use of coastal shipping, which is more fuel-efficient and environmentally friendly compared to road transport. Coastal shipping can reduce congestion on roads and cut down greenhouse gas emissions significantly.
- **Inland Waterways:** Development of inland waterways as part of the Sagarmala Programme provides an alternative to road and rail transport. Waterways are energy-efficient and emit fewer pollutants per ton-kilometer compared to road transport.

Development of Coastal Economic Zones: CEZs integrate manufacturing, logistics, and port operations, reducing the distance goods need to travel and optimizing the supply chain. This integrated approach reduces overall fuel consumption and emissions.

SAGARMALA
PORT-LED PROSPERITY



Driving Green: How DHL is Leading the Charge Towards Zero Carbon Emissions with Mission 2050

DHL's Mission 2050

DHL's Mission 2050 aims to guide the logistics industry toward a sustainable future and **achieve zero carbon emissions by 2050.** The main goals of this mission include:

- **Investing €7 billion** to reduce carbon emissions **by 2030** and committing to **zero emissions** by **2050**.
- To create **carbon-neutral buildings** that use solar power for their power needs.
- To decarbonise logistics operations using **sustainable fuels in aviation.**
- To use **green energy to run fleets** and facilities to enhance the decarbonisation process.
- To plan routes and networks more efficiently.
- To operate **70% of first** and last mile services with clean pick-up and delivery solutions using bicycles and electric vehicles, that work on decarbonising engines, by the year 2025.
- To incorporate **green solutions** in **50% of sales** by the year 2025.
- To train 80% of employees and involve them in environmental and climate protection activities by 2025.
- To plant **one million** trees each year.



DHL's GoGreen initiatives

Emphasising the importance of sustainable logistics for customers and businesses, DHL Express' **GoGreen initiative** offers climate-neutral shipping solutions that guide companies on how they can decarbonise and achieve their sustainability goals.

GoGreen Climate Neutral

Companies can offset their logistics greenhouse gas emissions by calculating the estimated CO2 emissions based on a shipment's weight and distance travelled. Then, they buy carbon credits via DHL Express from recognised climate protection projects to offset these emissions.

GoGreen Carbon Emissions Reporting

Through carbon emissions reporting, businesses can track and assess the impact of their shipments on the environment. This detailed information allows them to develop sustainable goals in ways that bring overall emissions down, while creating greater transparency with stakeholders and customers.

GoGreen Annual Certificate

The GoGreen initiative also provides an annual certificate to businesses that acknowledges their sustainability efforts. This certificate captures the amount of estimated carbon emissions your business neutralised on GoGreen shipments through environmental protection projects. The added benefit is that it reassures your customers that you are a business committed to creating a greener future.

DHL Group commitments to reduce Carbon Footprint until 2030

"Based on SBTi, our goal is to reduce our GHG emissions from 40 million metric tons CO2e to under 29 million by 2030. We plan to achieve our target through the following aspirations:"

Clean Operations For climate protection



Sustainable Aviation Fuels

Blending ratio of >**30% SAF** by 2030



Carbon neutral buildings

Starting in 2021, **all new** (owned) buildings built to be **climate neutral**



Sustainable Marine Fuels

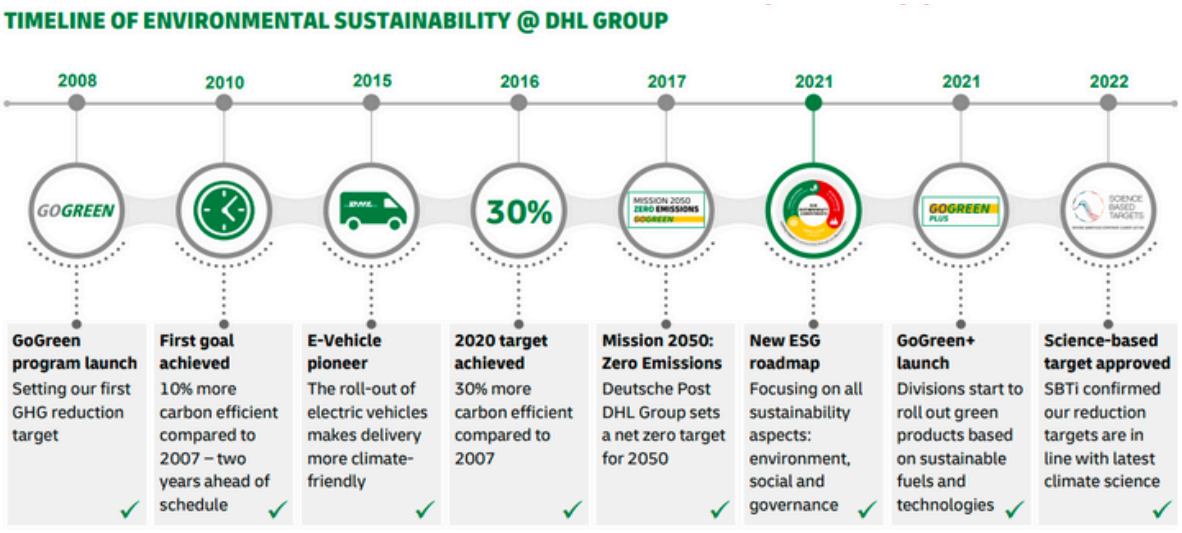
Sustainable Maritime Fuel blending



Green last-mile delivery

Electrify 60% of last□mile delivery vehicles by 2030

DHL Group been focused on environmental sustainability for many years



GreenLine Pioneers Sustainable Freight Solutions: Advancing India's Decarbonization with LNG & EV Trucks

To decarbonize heavy freight transportation in India, resulting in 1 mn ton CO2 emission reduction in 3 years by deploying 10,000 LNG & EV vehicles is the vision of Greenline.

GreenLine is a pioneer in clean fuel logistics, specializing in the safe and efficient delivery of LNG and CNG to off-gas-grid industries across India.

As a leading **LNG transporter**, GreenLine is now advancing green mobility by helping corporates transition to cleaner freight transportation. By switching to GreenLine's LNG-powered trucks, companies can decarbonize heavy trucking, reduce toxic emissions, enhance ESG performance, and gain economic advantages on their journey to Net Zero.

Mr. Anand Mimani, CEO, GreenLine said, "We are committed to enabling the ESG agenda of Indian corporates, and our green certificate program is part of our commitment to promoting sustainable mobility and reducing our collective carbon footprint"

GreenLine has collaborated with multiple organizations to create India's first & only integrated ecosystem to make low-emission LNG trucking a reality in India.

GreenLine is on a mission to decarbonize heavy trucking in India and is paving the way for the widespread adoption of LNG-powered freight transportation by showcasing its immense advantages for corporations.

Modern LNG-powered vehicles from **Blue Energy Motors** that are part of GreenLine's fleets have significantly lowered its clients' individual logistics businesses' carbon footprints by up to 30 per cent when compared to diesel-powered trucks.

How does GreenLine reduce carbon emissions and boost environmental sustainability?

GreenLine leads in sustainable transportation, deploying LNG trucks that achieve significant emission reductions:
30% less CO2, 59% less NOx, 70% less CO, 100% less SOx, and 91% less Particulate Matter compared to diesel.
This initiative has already cu**t 3,826 tonnes of carbon emissions,** equivalent to the carbon absorption capacity of **153,086 trees.**

GreenLine to invest ₹5,000 cr to acquire LNG trucks for green logistics

GreenLine has announced a substantial investment of ₹5,000 crore to enhance its green logistics operations by acquiring LNG-powered trucks. The company plans to add **1,000 LNG trucks** to its fleet with an investment of **₹850 crore** and expand by an additional **5,000 trucks in FY25** with a further ₹4,000 crore investment.

The company is also exploring the deployment of electric trucks for short-haul operations and is supported by its sister company, Ultra Gas and Energy, which is setting up 10 LNG retail stations across India to facilitate this growth.



GREEN CERTIFICATE BY GREENLINE

GreenLine, a leader in green mobility, has become India's first freight transportation company **to issue CO2 emissions reduction certificates** to clients JK Lakshmi Cement, UltraTech Cement, and Dalmia Cement. This initiative, in collaboration with ESG Risk Assessments & Insights Ltd., allows these clients to officially account for emissions reductions in their statutory and ESG reporting.

We are committed to enabling the ESG agenda of Indian corporates, and our green certificate program is part of our commitment to promoting sustainable mobility and reducing our collective carbon footprint. We believe that by working together, we can create a cleaner, healthier, and more sustainable future for everyone. I would like to congratulate our green mobility clients on their achievements and thank them for their commitment to sustainability. We hope that their example will inspire others to take similar actions and contribute to a greener, more sustainable future.
Mr. Anand Mimani, CEO, GreenLine

GreenLine has announced a substantial **₹4,000 crore investment** to support India's Fortune 500 companies in achieving their sustainability goals. This expansion will significantly boost our fleet of LNG trucks, purpose-built for heavy-duty, long-haul freight, offering a cleaner alternative to traditional diesel. By partnering with GreenLine, companies can reduce Scope 3 emissions and advance their net-zero objectives, positioning us as a key player in driving India's transition to sustainable transportation.

Greenline Mobility proudly received the Green Logistics Shakti Award at the Logistics Shakti Summit, recognizing their commitment to sustainability and innovation in logistics.

Leading the Way: GreenLine and GHCL Partner for Sustainability

GreenLine has announced its inaugural collaboration in the Chemical Industry with GHCL Limited, marking a significant milestone in its journey toward sustainability. This partnership represents a pivotal step toward decarbonization and aims to reduce Scope 3 emissions, showcasing GHCL's strong commitment to a greener future.

GreenLine and GHCL are dedicated to surpassing environmental standards and advancing sustainability through innovative solutions and strategic partnerships.





Strategic Recommendations

These recommendations are designed to help logistics companies navigate the challenges of sustainability while maintaining efficiency and profitability. By implementing these strategies, businesses can contribute to a more sustainable future for the logistics industry.

1. Adoption of Green Hydrogen for Heavy Freight

While EVs are popular for short deliveries, green hydrogen offers a promising solution for heavy freight. Logistics companies should invest in green hydrogen technologies and partner with energy providers to develop dedicated fueling infrastructure for long-haul transport.

2. Deployment of AI-Driven Predictive Analytics for Carbon Offsetting:

Logistics companies should use AI-driven predictive analytics to forecast carbon footprints across operations. This approach enables proactive carbon offsetting strategies, like dynamic pricing models that incentivize low-emission routes based on real-time data.

3. Optimizing Last-Mile Deliveries:

Logistics firms should consider innovative last-mile delivery solutions, such as the use of micro-mobility vehicles, dynamic route allocation, and parcel lockers. These approaches can help reduce urban congestion and lower the carbon emissions associated with last-mile logistics.

4. Investing in Next-Generation Biofuels:

Encourage investment in next-gen biofuels like algae or waste-based fuels to power heavy vehicles with minimal carbon emissions, providing a sustainable alternative to traditional fossil fuels.

5. Investment in Smart and Sustainable Warehousing:

Companies should invest in energy-efficient warehousing solutions like solar power, high-efficiency lighting, and advanced insulation. These measures reduce operational costs and lower the carbon footprint of logistics operations.

6. Integration of Circular Economy Principles:

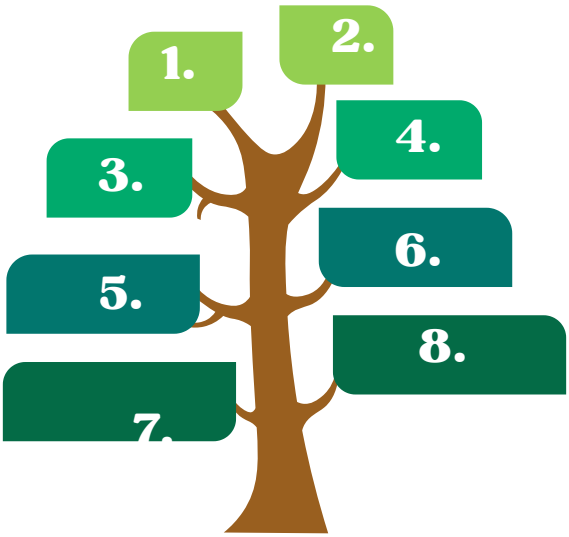
Logistics companies should go beyond reducing waste by actively engaging in the circular economy, redesigning supply chains for material reuse, refurbishment, and recycling. This involves developing reverse logistics systems to reintegrate products at the end of their lifecycle, minimizing waste and creating new value streams.

7. Commitment to Government Regulations and Standards:

Companies should proactively support stringent environmental regulations by reducing GHG emissions, improving fuel efficiency, and adhering to international sustainability standards.

8. Continuous Innovation and Employee Training:

Companies should foster a culture of innovation and sustainability through ongoing employee training, ensuring staff are engaged and knowledgeable about environmental protection to support long-term green logistics.





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THANK YOU

Do you have Any Questions?

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