LOGISTICS TREND RADAR 7.0

Insights. Shaping Tomorrow.

Your guide to innovation in logistics.
AI & Sustainability in focus.

DHL TREND RESEARCH

CONTENTS

The DHL Logistics Trend Radar is an invaluable strategic resource for our customers and the logistics community. It consolidates key logistics trends, with AI and sustainability taking the lead in this edition, driving the evolution of businesses, consumers, and technologies over the next decade. This empowers our customers and us to stay competitive in a demanding landscape.

KATJA BUSCH
CCO AND HEAD OF
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Insights. Shaping Tomorrow.

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Today's professional climate is often called the "new normal," implying our world has changed significantly since the global pandemic. But this new state is not static. We are living in a period of constant transformation in society, business, and technology. Successful logistics organizations are responding powerfully to this by putting customers at the center of every action, aiming for supply chain excellence that is global, resilient and, above all, sustainable.

Over more than a decade, the DHL Logistics Trend Radar™ has become a recognized benchmark for strategy, innovation, and education, helping logistics professionals navigate ever-evolving landscapes and seize new opportunities. With this seventh edition, our commitment remains the same – to provide DHL customers, colleagues, and partners with valuable insights that reflect the direction of societies, businesses, and technologies, enabling the logistics community to shape tomorrow.

Shaping tomorrow requires innovation and collaboration. The DHL Logistics Trend Radar underscores the significance of both, enabling a deeper, shared understanding of emerging trends, anticipating future disruptions, and encouraging organizations to foster partnerships. Collaboration within and outside the industry is the most effective way to create and co-create groundbreaking solutions and proactively adapt strategies to stay ahead of the curve.

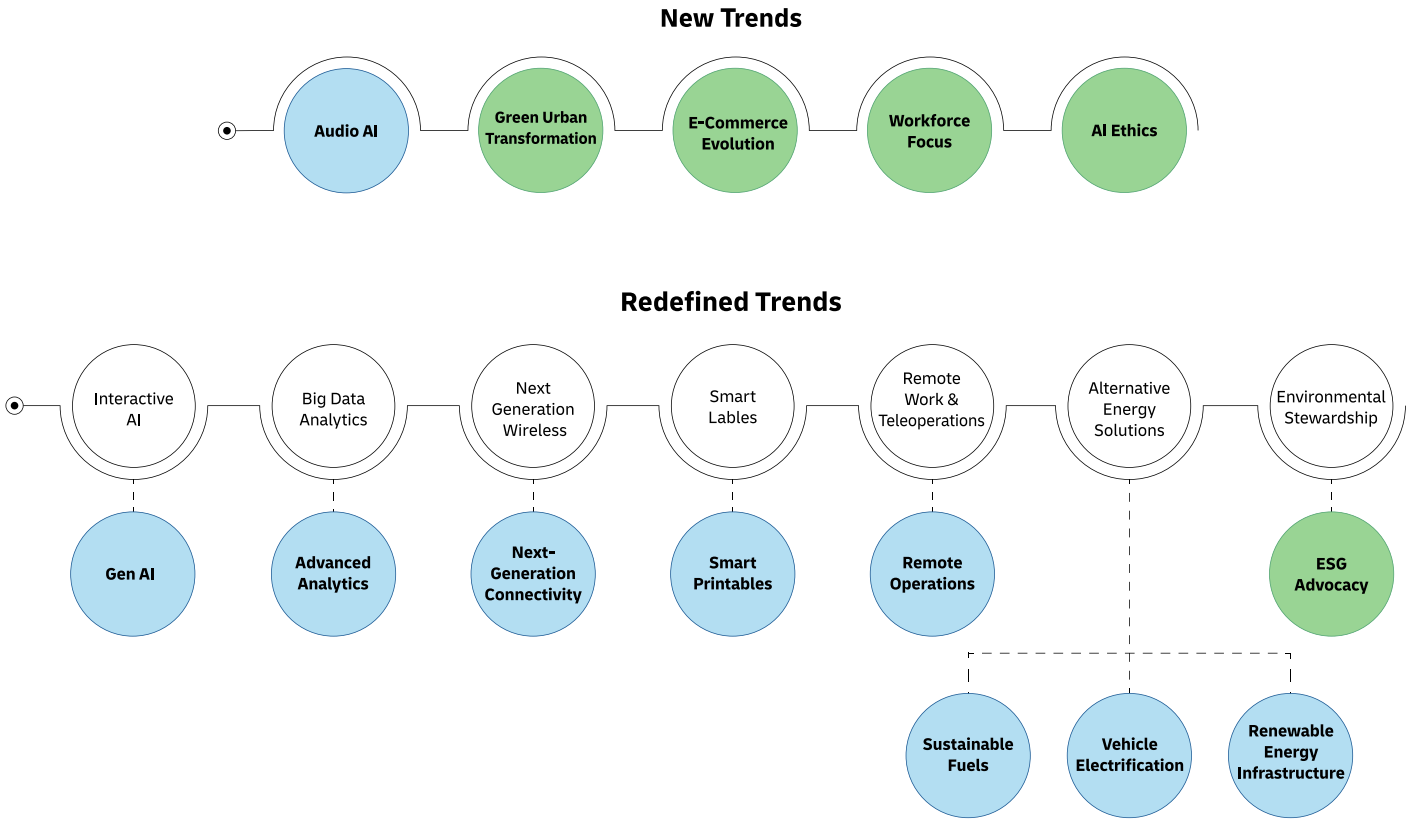
Please enjoy the discovery and inspiration of the latest trends influencing logistics. We welcome you to connect with the open DHL innovation ecosystem, and we look forward to shaping tomorrow together through true innovation – beyond potential.

The DHL Trend Research team has been closely monitoring key technology as well as social and business trends for over a decade. Every two years, the team updates the Logistics Trend Radar to reflect our perspectives on the development of existing and newly emerging trends, and how they impact logistics as a whole.

Since publication of the previous edition of the Logistics Trend Radar in 2022, we have witnessed several relevant developments that have influenced both, trends' adoption and impact on logistics, i.e. changing the position of trends on the radar. Additionally, through countless engagements with customers, colleagues, and partners, we have identified new trends to drive enhanced discussions and accelerate collaboration on logistics innovation. Overall, this has altered the composition of this latest publication, the Logistics Trend Radar 7.0. There is more focus on trends identified with an adoption timescale of five years or less, as well as showcasing noteworthy developments in artificial intelligence (AI) and in sustainability.

The basis of the Logistics Trend Radar is DHL's customer-centric, integrated approach which empowers us to harness the perspectives of our valued customers along with those of DHL colleagues who are on the ground daily, driving and experiencing the transformation of logistics. We complement these insights using classic research methodologies and incorporate the viewpoints and assessments of multiple experts, including key opinion leaders from influential think tanks, renowned consultancy firms, and top-tier academia from around the world.

LOGISTICS TREND RADAR 7.0
Overview of changes vs. 6.0



Graphic source: **DHL (2024)**

OUR INNOVATION APPROACH

It is our core belief that delivering impactful innovation in logistics can only be achieved by staying close to customers, close to technology, and close to operations.

We cultivate open conversations and engagement with our customers about business strategies, future needs, and challenges in order to validate ideas, develop use cases, and leverage technologies and expertise. We achieve success through strong customer buy-in and close collaboration across our innovation ecosystem.

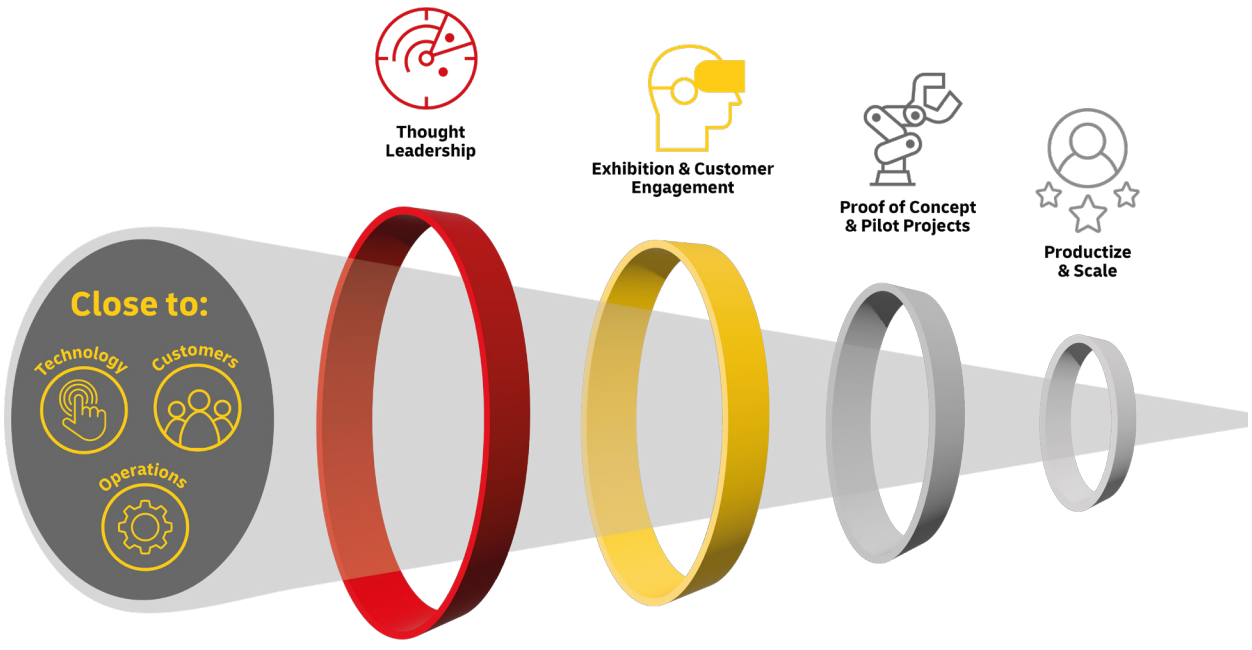
We are driving the transformation of logistics by tracking and engaging visionary developers and providers across industries and by staying at the forefront of emerging technology and supply chain innovation. This enables us to identify and co-create new solutions beneficial to our customers.

We leverage our own global DHL logistics operations to improve efficiency, quality, sustainability, and safety. Our commitment to spending substantial time on-site with facility managers and workers is testament to our dedication in visualizing and implementing solutions that yield benefits for both our valued customers and colleagues.

Our end-to-end innovation approach starts with thought leadership and continues through customer engagement, technology scouting, and research, all of which enables us to identify and understand technological breakthroughs.

This is the foundation of the Logistics Trends Radar and of many other DHL thought leadership trend reports. With a finger on the pulse of relevant trends, we run proof-of-concept projects in real-world supply chain settings with our customers and within the DHL network of operations to fully understand application benefits and challenges. Successful projects open up opportunities for productization and scaling, so that these solutions are available internally across DHL operations and commercially to our customers.

DHL Trend Research Innovation Funnel



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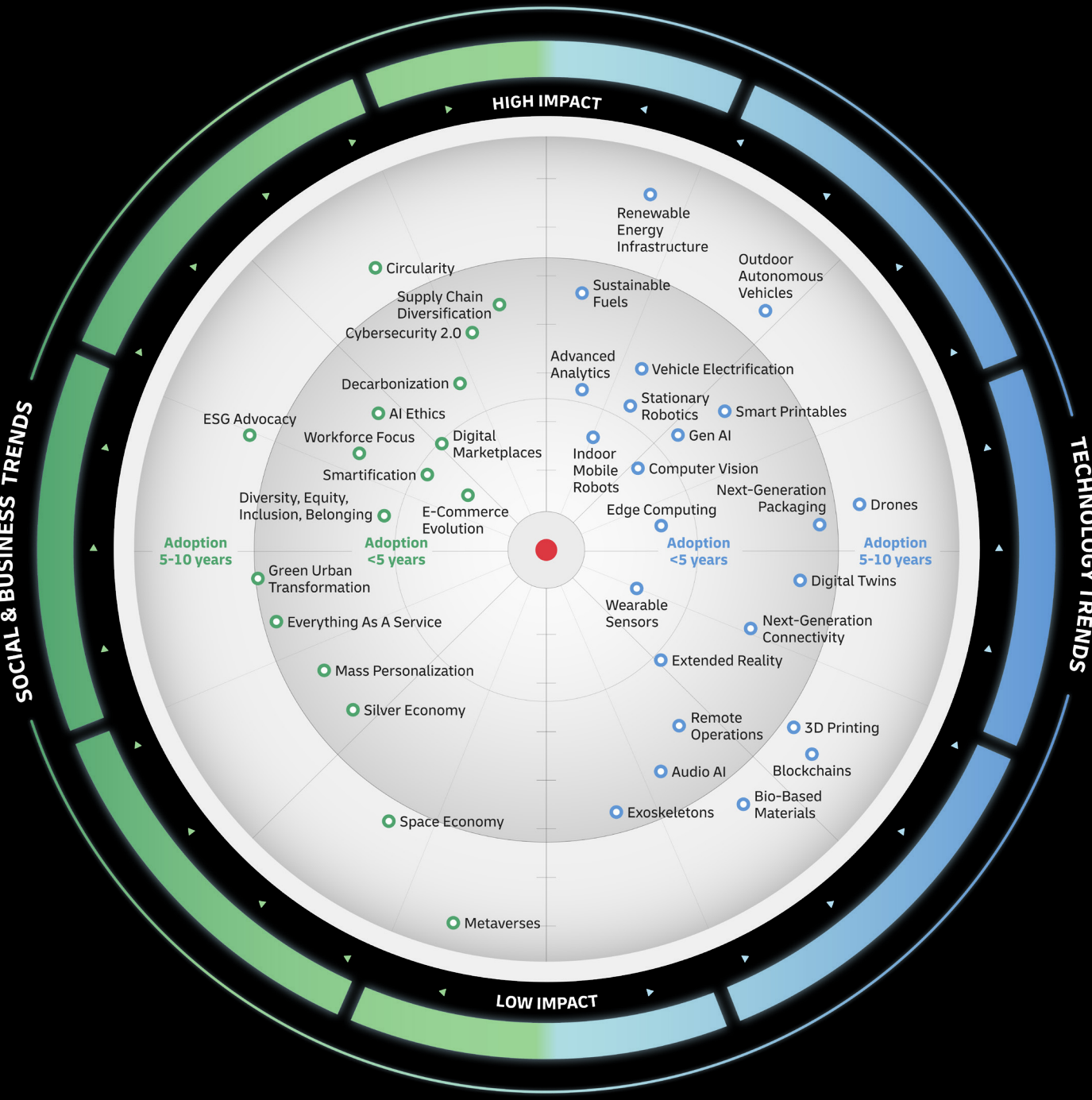
THE DHL LOGISTICS TREND RADAR 7.0



HIGH IMPACT
Revolutionary applications that are potentially disruptive.

LOW IMPACT
Evolutionary changes with incremental improvements.

ADOPTION
The common way of operating and doing business in logistics.

Section Contents

Circularity

The trend of Circularity aims to eliminate waste and pollution by considering the full product lifecycle in advance, designing and utilizing each item and its constituent parts to be returned in the supply chain. This trend seeks to reuse, repair, remanufacture, and recycle products as much as possible and, when these processes are no longer achievable, products are broken down into reusable components and raw materials and ultimately biodegraded.

There is gradual but unsteady progress towards a circular economy. Although 55% of large businesses have committed to circularity, more than half of their initiatives are narrowly confided to recycling or waste management. Many companies' strategies are not yet encompassing the full range of technologies and business models for a circular economy, for example, re-engineering products to last longer, embracing repairability, adopting leasing models, reducing virgin material use and providing complimentary services throughout the lifecycle of a product.

> *The Circularity Gap Report reveals the vast majority of materials entering the economy over five years to 2023 were virgin, with the share of secondary materials declining from 9.1% to 7.2%.*

However, new legislation is likely to strengthen progress. A good example of this is the European Commission's new rules on the 'right to repair' for consumers, which may incentivize companies to implement more sustainable solutions. Circularity concepts require dramatic transformation of the processes of product design, production, and recycling, which is why the supply chain is a key enabler of this trend managing and moving flows of raw resources, goods, returns, and waste among a new network of users in a sustainable, circular manner. Circularity as a trend is therefore likely to significantly impact the logistics industry, with logistics players becoming essential sources of knowledge for the transfer of best practice across sectors. But current momentum to explore, invest in, and adopt circular products and solutions appears lacking. Hence, it will take considerable time for circularity to achieve maturity and widespread adoption along the supply chain.

The Rise of Recommerce

Industrial sectors, especially retail, are witnessing the rise of recommerce (also known as reverse commerce), in which previously owned products, new or used, are sold and shipped to buyers who then repair, reuse, recycle, and/or resell them, extending the lifespan of the product. This not only promotes sustainability but also reduces emissions associated with manufacturing new products. This trend is evident in the smartphone sector, with the market for new smartphones falling by 3.2% in 2023. In contrast, International Data Corporation (IDC) estimated that global shipments of used smartphones, including officially refurbished and used smartphones, would reach 309.4 million units in 2023. This corresponds to an increase of 9.5% compared to the 282.6 million devices shipped in 2022. This development is also evident in the e-retail and fashion sector; however, things are a bit more complex. While customer-to-customer (C2C) platforms like Vinted are growing, it remains uncertain whether large companies are committed to transitioning to a circular business model or if they view second-hand platforms as additional income sources only. In contrast to fast fashion giants, renowned for their mass production and affordability but often lacking a clear and dedicated recommerce strategy, the luxury sector has demonstrated notable advancements in this domain. Esteemed platforms like Vestiaire Collective, which is funded by luxury group Kering among others, are gaining increasing popularity by offering second-hand luxury goods such as bags and clothing. Furthermore companies like Patagonia embrace recommerce as part of the business model, prioritizing circularity and sustainability. As the industry evolves, it is crucial for companies to consider the long-term environmental impact of their business models on the future of fashion. Recommerce business models present challenges for all industries, especially in terms of goods inspection. Currently, this task is labor-intensive, although digital solutions, such as computer vision technology, may help in the future. However, used items typically have low profit margins, raising questions about the long-term viability of these business models.

The rise of recommerce impacts logistics in several ways. Instead of traditional return logistics, recommerce supply chains redirect return shipments to in-market repair, recycle, and/or resell channels, leading to more localized, yet complex supply chains.

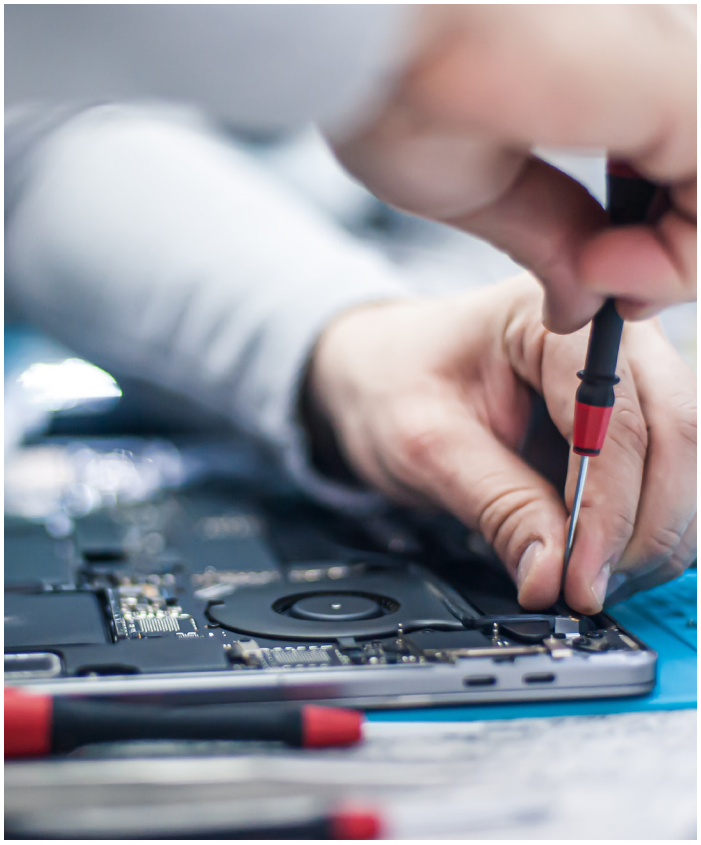
Circular Packaging

In the context of circular packaging, plastic remains a significant concern. Over 90% of the 400.3 million tons of global plastics produced in 2022 was fossil-based. In the five preceding years, greener alternatives – mechanically recycled, chemically recycled, bio-based plastics, and carbon-captured plastics – increased only

slightly from 8.4% to 9.4%. Targets for minimum recycled content in plastic packaging are under discussion – the Packaging and Packaging Waste Regulation (PPWR) of the European Union seeks 30% by 2030 and 50% by 2040 for contact-sensitive plastic packaging, excluding single-use plastic beverage bottles. Compostable plastic packaging and packaging with less than 5% plastic content are also included in the targets. Existing solutions like refillable options for consumer goods and compostable, bio-based packaging in the e-retail and fashion sectors demonstrate the potential of circular packaging but are not widely implemented.
What's needed are convenient and incentivized takeback processes that are as convenient as discarding the packaging. In logistics, implementation of circular packaging requires comprehensive visibility of supply chain processes to ensure the appropriate distribution of packaging across warehouses and production facilities. Also, existing transportation capacity must be fully utilized, leveraging existing delivery routes to minimize carbon emissions and costs.

Forming win-win partnerships across the value chain helps de-risk circularity investments. Key challenges include significant upfront costs and the costs of returning and cleaning circular packaging, both of which limit solution scalability. Clearly, price points remain a crucial barrier to widespread adoption of circular packaging.

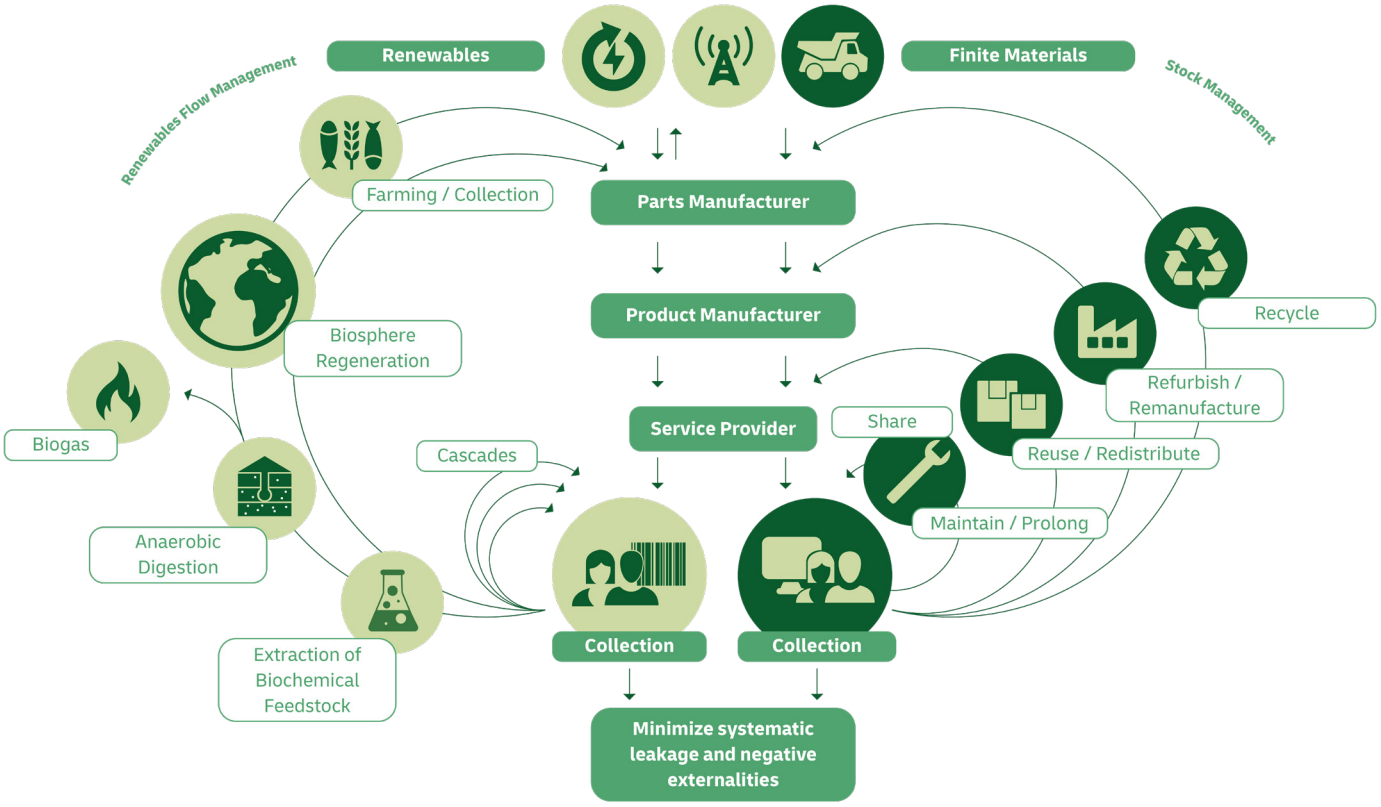
Reverse Logistics



As more companies around the world join the circular economy to reduce waste and save costs, they will be reexamining and redesigning their supply chains to conform to circularity principles. For organizations in logistics, from those handling storage to those delivering in the last mile, this can mean sizeable shifts in operations and a focus on so-called reverse logistics offerings. Next to running warehouses and moving goods, logistics providers may see increased demand for value-adding services for products and materials they currently do not carry.
As mentioned above, circularity is boosted by the European Commission's legislation giving consumers the 'right to repair'. Consumers can save costs, as the law entitles them to repair during and after the legal guarantee period and are allowed to repair products themselves. For logistics and supply chain managers, this increases the need for accessible spare parts, repair manuals, and information on reparability, while considering business concerns about intellectual

property rights and professional repair services. Additionally, warehouses may see a greater throughput of secondary raw materials like fabric scrap or reprocessed lubricants and may need to reconfigure facility floorspace and operations to unload, store, and load more of these products.

Taking the complex example of damaged electric vehicle (EV) lithium batteries, logistics service providers must establish specialized expertise in reverse logistics to ensure compliance with local, regional, and global regulations on transportation. This entails comprehensive considerations for battery management, storage, and handling to guarantee adherence to regulatory requirements. Overall, circularity and in particular the demand for reverse logistics solutions will bring changes and value-adding opportunities to local and global supply chains. The logistics industry needs to anticipate and prepare for this.



Source: **DHL Group (2024): Era of Sustainable Logistics Whitepaper**

Graphic source: **DHL Group (2024): Era of Sustainable Logitics Whitepaper**

SUMMARY & TREND OVERVIEW

Challenges

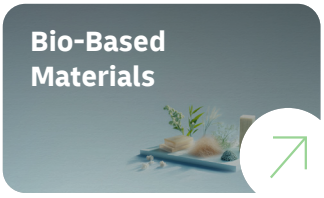
- Most products are not currently designed for reuse and recycling, limiting their ability to achieve circularity principles.
- The inhibition threshold for end customers to change their own lifestyle and actively participate in circularity is high.
- Coordinated visibility and transparency of products and their components is crucial for redirecting waste as raw materials, but data is currently severely limited, hampering attempts to close loops across supply chains.
- Changes in the supply chain set-up for companies to implement, such as circular packaging solutions, can be complex, very expensive, and take time.
- Smart, affordable, and convenient return solutions are not available everywhere, so recycling can be more expensive than using primary raw materials.

Outlook

As the right to repair becomes ratified by legislation, companies must prioritize repairable, sustainable product design, provide spare parts and repair information, and encourage consumer engagement in circular practices. Supporting all this is the logistics industry as the backbone of circularity. Logistics service providers must adapt their capabilities, invest in technology, and collaborate to facilitate repair, refurbishment, and recycling. This also includes the development of new logistics service offerings.

This trend should be actively monitored with developments and use cases on the horizon.

Related Trends



DHL Resources

Return to sender? Reverse logistics explained

Whitepaper: Delivering on Circularity

Sources

Bain & Company (2023): 55% of large businesses have made circularity commitments, but linear mindset is holding back progress
Circle Economy Foundation (2024): The Circularity Gap Report
International Data Corporation (2024): Worldwide Market for Used Smartphones Is Forecast to Surpass 430 Million Units with a Market Value of $109.7 Billion in 2027, According to IDC
Plastic Europe (2024): Plastics – the fast Facts 2023