Efficient warehouses fit sustainable operations

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Sustainability has become an important issue for warehouse management in the US. Reducing the environmental impact of operations is a big challenge that can be overcome by improving process efficiency. In many cases, this is achieved by implementing warehouse automation. Efficient, automated processes need less energy, emit fewer greenhouse gases, and can do more within compact facilities. However, by choosing an automation partner that also champions sustainability, warehouse operators can truly maximize these benefits.

Hans Jongebloed, Senior Postal and Parcel Expert at Prime Vision, a global leader in computer vision integration and robotics for logistics and e-commerce, looks at sustainability challenges facing US warehouses and how the company reduces environmental impact.

Sustainability considerations for warehouses

A good place to start the journey to a sustainable warehouse is the facility itself. Solar panels, modern insulation, and a renewable energy supplier can greatly reduce the carbon footprint of operations. Placement is another factor to consider. A giant warehouse in an area of great natural value is undesirable aesthetically and ecologically, but logistics also play a part. Locating a compact warehouse in an optimal area for local deliveries, with good road connections, away from nature hotspots, minimizes environmental damage and traffic pollution.

Sustainability also applies to people. Thankfully, the days of warehouse workers walking miles carrying heavy loads week after week are almost behind us. With robots and other material handling solutions, personnel are no longer subjected to this level of manual labor, ensuring a happier, healthier workforce that is more willing to stay on.

While these sustainability goals can be reached, a particular industry challenge illustrates how warehouses can further improve the efficiency of operational processes and reduce environmental impact.

The point of no return

We've all indulged in clothes shopping at some point, and many of us choose to do it online. However, while an outfit can be easily tried on at the store, e-commerce customers do that at home, presenting warehouses with a big sustainability problem: returns. Millions of them.

One US logistics company stated that the CO_2 cost of returning e-commerce purchases was similar to the output of 3 million cars.[1] While e-commerce returns have dropped slightly compared to 2020 and 2021, they still amounted to $ 203.22 billion in 2022 (18% of total online purchases). The decline is expected to continue, hitting 14.7% in 2026.[2] Despite this trend, returns will continue to be a challenge for e-commerce businesses in the US.

Returns are a big sustainability issue for e-commerce, as they constitute a high volume of products swimming against the stream of the normal shipping process.

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[1] Buy. Return. Repeat … What really happens when we send back unwanted clothes? – The Guardian

[2] https://www.insiderintelligence.com/press-releases/retail-returns-will-surpass-620-billion-in-2023/

First, the item needs to travel back to a distribution center (often different from where it came from), generating transport emissions. Then, it is a long, cumbersome manual procedure to identify the product, check its condition, and sort it properly. This often requires large numbers of personnel, generating extra CO_2 from commuting. If an item can't be recycled or resold, it ends up as landfill, producing unnecessary waste. Needless to say that in the era of unlimited free returns, all these processes can also create extra costs for sellers.

This is clearly an area for improvement. However, enhancing the efficiency of the process flow offers a solution not just for returns, but any warehouse operation.

Automation equals efficiency

Naturally, automation is one of the main answers to this efficiency challenge, and thankfully, increasing efficiency always has a positive impact on sustainability.

Using the returns example, being able to quickly check products with computer vision systems, transport goods to appropriate areas for resale or recycling with robots, plus spot trends and areas where processes can be improved with analytics software can greatly expedite operations. Furthermore, it requires fewer personnel to function. By harnessing renewable energy to power automated equipment, warehouse operators can also mitigate the impact of the electricity demand, delivering these efficiency benefits sustainably.

Automating warehouse processes in this manner allows fulfillment and returns to be conducted on a reduced timeframe, within a more compact site, all while minimizing emissions, energy consumption and, effectively, lowering the operating costs. This means that sustainability goals can be met at every level of operations. However, choosing the right solutions can also bring additional benefits.

Sustainable approach to automation

At its facility in Richmond, Virginia, Prime Vision is working not just to provide products that enable the efficient, sustainable running of warehouse operations but is also reducing the carbon cost of the solutions themselves.

Robots are a critical component of a modern automated warehouse but are complex pieces of equipment that are intensive to produce. Consequently, Prime Vision focuses on reducing the impact of maintaining robots. A repair-rather-than-replace approach helps improve sustainability, but when a robot is beyond repair, Prime Vision rescues as many parts as possible to be used as spare components. Good-quality parts are fitted to other robots or used for in-house research - effectively recycling the components. Inspections identify and separate sub-par components, so there is no risk of fitting the robots with inferior parts. Localized repair facilities further ensure that spares and maintenance personnel can reach customers without generating the excessive carbon emissions associated with long-distance travel.

Software is another area of focus. Maintenance can be carried out remotely, so nobody needs to drive to site to carry out updates. Prime Vision also continually optimizes its software to run more efficiently, which reduces the number of servers required. Expanding on hardware and helping customers to collate facility computing power in an optimal, well-monitored space can save additional energy during installation and operation. Prime Vision applies new IT developments too, like hyper-converged infrastructure. Such cloud-style solutions with high scalability and efficiency can eliminate the need for large quantities of servers on-site, allowing customers to downsize infrastructure while adding the required flexibility.

Choosing the right partner

Ultimately, to save the planet, the whole supply chain must work together to achieve the most sustainable logistics operations. This includes cooperation between warehouses and the companies that supply automation solutions to them. While the

increased process efficiency enabled by robots, computer vision, and analytics software can greatly reduce the carbon footprint of warehouse operations – there is the provider to consider too.

Prime Vision is dedicated to reducing the environmental impact of its products and operations. A dedicated sustainability team continually assesses carbon footprint, identifying focus areas and actively lowering the company's emissions. Along with its solutions and local presence, this ensures that while Prime Vision contributes to improving the sustainability of US warehouse operations, like its customers, it is also working on reducing the impact of the overall supply chain.

Image captions:

Image 1: A compact warehouse equipped with solar panels, modern insulation, and located in an optimal area for local deliveries can greatly reduce the carbon footprint of operations.

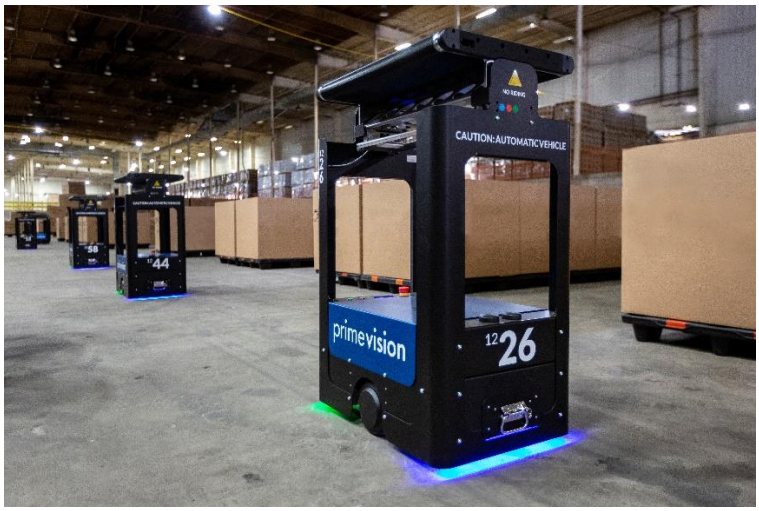

Image 2: Prime Vision focuses on sustainable practices of recycling robot parts and using them for in-house research.

About Prime Vision

Prime Vision is a global leader in computer vision integration and robotics for logistics and e-commerce. As an award-winning company, Prime Vision designs and integrates solutions using the latest recognition, identification, and robotics techniques to optimize the automation of sorting processes.

With offices based in Richmond, VA and Delft, The Netherlands, more than 170 Prime Vision experts provide comprehensive market and domain knowledge to companies around the world.

For more information, visit https://primevision.com/.

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