

The future of roll warehousing is carbon-neutral

Pesmel’s automated warehousing solutions do not just increase efficiency and productivity. They are also an integral part of the company’s comprehensive carbon-neutral solution for sustainable intralogistics.

For over 40 years, Pesmel has been providing customers with many benefits such as improved energy efficiency, shorter turnaround times, and space optimization. Today, the unique high-bay automated storage and retrieval system (ASRS) also allows the establishment of carbon neutral warehousing, improving the overall sustainability of customer’s operations. Because warehousing and logistics are a key element of any paper supply chain, creating carbon neutral warehousing and logistics has a big role to play in reducing the environmental impact.

“Pesmel’s unique high-bay ASRS allows the establishment of carbon neutral warehousing.”

Examining the possibilities

To fully understand the contribution that can be made with sustainable warehousing, Pesmel prepared a new climate impact summary examining the carbon footprint of Pesmel solutions. An ASRS of a mid-sized paper mill producing 820,000 metric tons annually with two stacker cranes and a lifecycle of 40 years was evaluated. The life cycle greenhouse gas emissions of this scope of supply were calculated at just under 17,000 metric tons of CO₂e, the majority of which comes from two sources – the steel required for manufacture and the operational energy consumption. The calculation includes materials, manufacturing, use of the system, and disposal.

Steel is the main material used in ASRS, making up approximately 95% of all materials in the racking, cladding, and stacker cranes. In our example, this amounts to about 4,140,000 kg of steel. The rest consists primarily of mineral wool and zinc for cladding, and fuel used during installation. Although the production of steel requires significant energy outlay, it holds an important position in the circular economy. It is the most recycled material in the world and can be recycled many times without reducing its quality while using only one third of the energy needed to make virgin steel. For every one kilogram of steel that is recycled over the product’s life, a saving of 1.5 kilograms of CO₂e is realized.

Sustainable stacker cranes and solar solutions

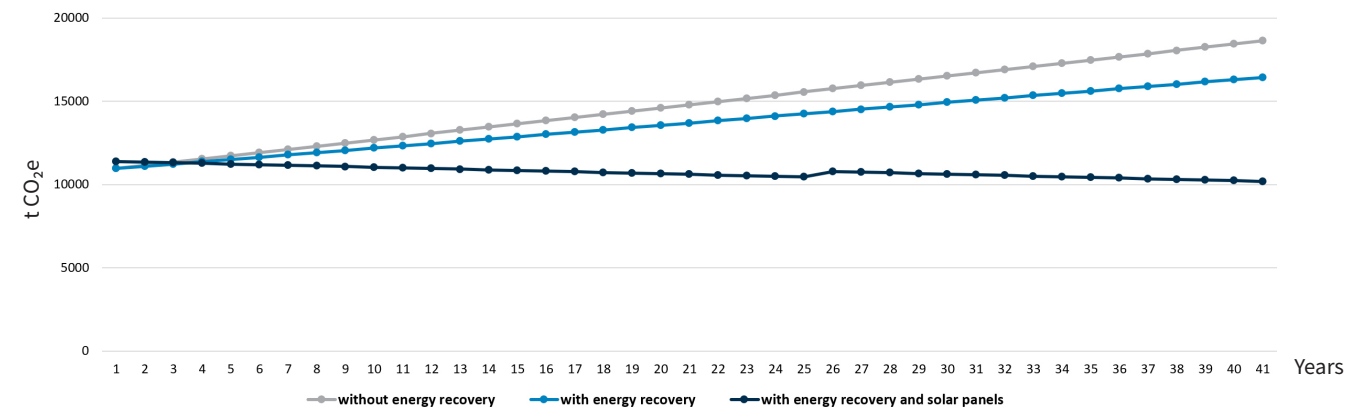
The other main way in which CO₂ emission reductions can be made is by increasing the energy efficiency of the ASRS. The ultimate goal is to create a solution whereby more energy is produced than consumed. For many years, Pesmel has included regenerative drive technology in stacker cranes as a well-established and easy way to reduce energy use. Included in the standard offering, braking energy is collected and fed back into the power grid. This technology is paired with energy efficient operating devices that are optimized according to usage requirements.

To minimize carbon dioxide emissions, Pesmel recommends the use of rooftop solar panels. As on the accompanying graph, harvesting renewable energy on-site to meet energy demand makes a big difference, as it covers, and even compensates, the CO₂ emissions of energy consumption during operation, assuming the EU’s average solar energy potential. The ASRS’s electric infrastructure can also be utilized for rooftop solar power grid. The solar energy system can be included by Pesmel as part of the delivery.

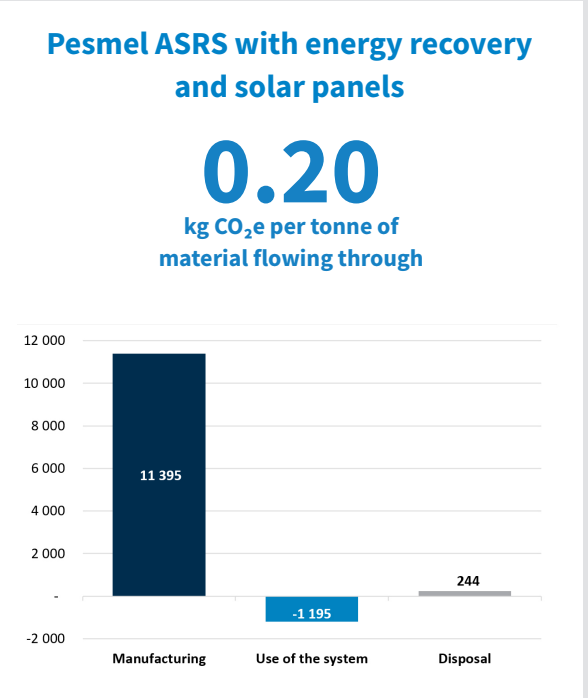
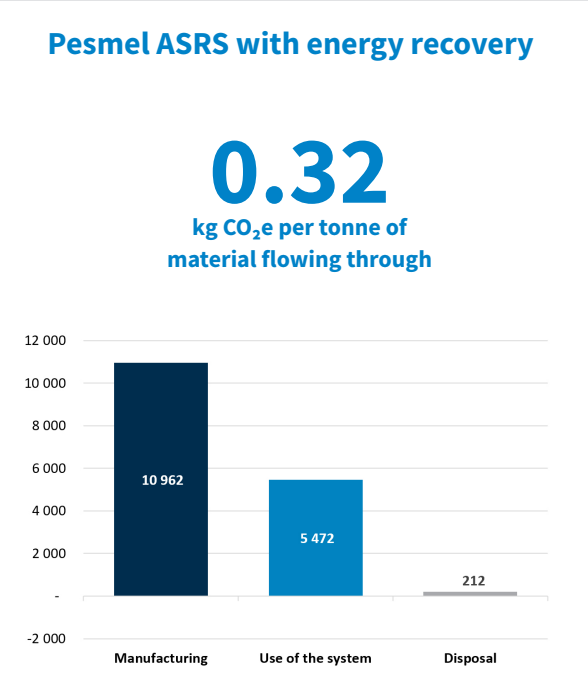
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The climate impact summary showed that using the specified solution results in carbon dioxide emissions per handled tonne of paper of 0.32 kg when solar panels are not installed. With their installation, CO₂ emissions drop by about 37,5 % to only 0.2 kg per handled tonne.

By giving the possibility for carbon-neutral warehousing, Pesmel’s ASRS has become an essential part of a sustainable logistics ecosystem.



CO2 emissions of the example ASRS over 40-years lifetime with different energy supply and recovery alternatives.*



Climate impact over 40-years lifecycle including manufacturing, usage and disposal phases in alternative ASRS solutions.*

*Third party verification: Streamlined life-cycle assessment verified by Ilmastoapu Oy (www.ilmastoapu.fi)