The Waste
We Don't See

Could RFID Help Unlock Intelligent
Recycling at Scale?

You finish your snack and toss the wrap into the recycling bin. It's a small act, but one you feel good about. The expectation? That the packaging will be sorted, recycled, and reborn as something new. In reality, however, it is far more complex.

In Europe alone, the most recent data from 2022* revealed 16.16 million tonnes of plastic packaging waste was generated, yet only 40.7% was recycled . Contamination, mis-sorting, and inefficient infrastructure often derail good intentions. For consumers, this is frustrating. For the planet, it's unsustainable. And for businesses and communities tasked with managing waste, it's demanding innovation.

A System at Capacity

Recycling systems are under pressure. A single item in the wrong stream is lost material and it can downgrade an entire batch of recyclables. The problem is compounded by increasingly complex packaging, which often features a mix of plastics, films, and labels that are difficult for both consumers and sorting machines to identify and process correctly.

Meanwhile, brands face growing scrutiny from regulators, investors, and consumers who are increasingly demanding accountability for environmental impact. This heightened focus is driving the adoption of new policies like Extended Producer Responsibility (EPR) schemes, which are gaining momentum and requiring producers to verify that their materials are recoverable and responsibly managed.
Waste managers are facing increasing pressure to do more with existing systems. However, their current methods rely heavily on visual identification, optical sorters, and manual labor, which are proving difficult for the scale of today's challenges. To keep pace, the industry needs to innovate and integrate scalable solutions for material identification and sorting.

* Plastic waste and recycling in the EU

RFID as a Sorting Solution

What if waste sorting facilities can know exactly what a package is, what it's made of, and where it should go? Radio Frequency Identification (RFID) is an established technology with new potential in the recycling process. By embedding RFID tags in packaging, every item can carry a unique digital identity that can be read at high speed and in real-time. But it's not just about technology. It's about how it's applied and the total system.

Veolia's: A Real-World Example of RFID in Action

At one of Veolia's advanced sorting centers in Europe, RFID is already making a measurable difference. Working with Turck Vilant Systems, a leading RFID system integrator, the facility was outfitted with 32 RFID antennas and 9 industrial-grade readers, embedded throughout key points in the waste sorting process to identify how plastic packaging performs in sorting.

From the moment tagged packaging items enter the system, passing through bag openers, ballistic separators, and conveyor belts, the RFID readers detect their presence and identity in real time. This enables the facility to track packaging with precision never before possible.

This data informs brand owners on the sorting efficiency of their packages. They are able to improve their design if needed to achieve higher sorting rates, and in turn increase the potential of recyclability. „If packaging can't be sorted, it's not recyclable", says David Wardle, Packing Engineer at CIRCPACK by Veolia. Ensuring and improving a packaging's sortability is vital and even a small improvement in packaging sorting can translate to tonnes of waste diverted from incineration every week.

"We are proving this is possible. Imagine this solution working at scale across the entire waste management industry in Europe?"

David Wardle, CIRCPACK by Veolia.

For Business and Sustainability Leaders: What RFID Enables

RFID-enabled sorting isn't just a tool to improve recycling targets. It's a foundational technology for building a smarter, more transparent, and truly circular economy.

1. Enhanced Operational Testing Efficiency

By enabling automated item-level material identification using RFID, the testing process is dramatically faster and more accurate.

2. Design Feedback for Brands

The system generates insights into how different types of packaging perform during sorting. Brands can leverage this data to optimize their packaging for recyclability, creating a powerful feedback loop between product design and its end-of-life performance.

3. Integrate with Sustainability Reporting

When brands can verify that their packaging is recovered and recycled effectively, they can make credible and data-backed sustainability claims. This is more important than ever, as consumers are increasingly demanding proof, not just promises.

A Model of Collaboration

The success at **CIRCPACK by Veolia** is a testament to what's possible when technology, expertise, and shared purpose come together. **Avery Dennison** brings decades of leadership in materials science and RFID innovation, and **Turck Vilant Systems** ensures that the technology is seamlessly integrated into complex industrial systems. Together, we exemplify what can be achieved through collaboration and innovation.

Scaling the Circular Economy

What if every packaging item had a digital passport? What if every recycling facility could sort with 90%+ accuracy   ? What if RFID could give packages a second life? What if brands, consumers, and waste managers were connected by a common digital infrastructure that kept materials in the loop? That's the vision RFID enables.
At Turck Vilant Systems, we see this not just as a technological advance, but as an opportunity to create measurable value for businesses working for a better tomorrow. By harnessing collaboration across partners like Veolia and Avery Dennison, and by leveraging our RFID and tracking expertise, we're helping to build circular systems that reduce waste, improve transparency, and accelerate sustainable growth. Together, we can reimagine business and close the loop.

Achieving a flawlessly digitized supply chain requires external consulting from a vendor or supplier of RFID, RTLS or Active Tracking systems. At best, a turnkey supplier and system integrator that offers and knows more than just one of these technologies.

A partner who develops hardware and software. A consultant who understands the logistics and production processes and challenges in your industry and sector. Someone with a proven track record in projects of various sizes in numerous countries. Someone, who has the best partners in the world.

We at Turck Vilant Systems feel that we, alongside with experts like Avery Dennison are the right partner to deliver a digital future.

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