



## Reverse Vending

The smart network that turns waste into data.

# Rethinking recycling:

The implementation of the deposit, return and refund system (SDDR) transforms waste management into a distributed digital infrastructure, where reverse vending machines (RVMs) act as smart nodes connected in real time.

**41% Current collection rate**

Spain needs to almost double its current plastic bottle recovery rate to comply with new legal frameworks.

**+90% overall success rate**

Norway and Lithuania have already achieved this return rate thanks to the digitalisation of the incentive scheme.

**+10% annual growth**

Forecast expansion of the RVM market until 2030, driven by regulation and IoT.

## RVM Anatomy

### Reverse Vending, the heart of this new system

Reverse Vending machines are high-precision devices that combine advanced hardware to ensure the purity of the collected material:



**Machine vision identification:** Instant recognition of containers via barcode scanning and visual pattern recognition.



**Validation sensors:** Advanced sensors that verify the weight, shape and material of the container in seconds.



**Smart compaction:** Internal mechanisms that reduce the volume of waste, optimising storage capacity and minimising collection visits.

# Use cases

Solutions designed for every environment.

The versatility of RVM allows for integration across multiple scenarios:



## Retail and supermarkets

It allows for integration with dynamic loyalty programmes and the automated management of incentives to enhance the customer experience at the point of sale.



## Events and festivals

The use of portable, connected infrastructure designed to handle large spikes in usage over short periods, enabling real-time monitoring of cleaning operations during the event.



## Public spaces and Smart Cities

The installation of municipal nodes that facilitate the optimisation of collection routes based on real-time data, reducing the carbon footprint of the urban cleaning service.



## Campuses and businesses

The promotion of sustainable habits through gamification and the collection of aggregated participation data for companies' sustainability (ESG) reports.

# The digital infrastructure

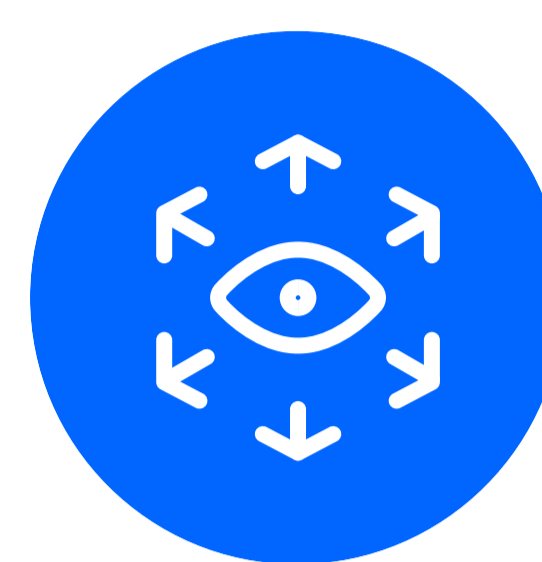
A national network connected in real time.

The success of the SDDR lies in its ability to operate thousands of distributed nodes as a single coordinated system:



## Multi-technology connectivity

Use of 4G/5G, fibre and NB-IoT networks to ensure stable and secure data transmission.



## Remote monitoring (IoT):

Platforms that enable centralised monitoring of fill levels, technical incidents and usage patterns.



## Service availability:

Application of predictive maintenance to anticipate failures, ensuring that machines are always operational for the public.



## Structural cybersecurity:

End-to-end encryption and secure identity management to protect critical infrastructure exposed in public spaces.

