Stargate
within EU Green Deal

Project Fact Sheet

Smart waste flows

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement GA101037053

01 BASIC PROJECT INFORMATION

Project name	**Smart waste flows**
Partners involved	**Brussels Airport Seenons Vebego**
Implementing airport / site	**Brussels Airport (Terminal zone)**
Period tested	**2025-2026**
Project lead / contact	**Brussels Airport Company**

02 OBJECTIVE

What are we trying to solve or tackle with this project?

Understand what passengers throw away, where sorting goes wrong and how bin design, clear instructions and collection set-up can improve sorting and collection.
Combining a data driven approach with small scale impact testing to establish a clear view on patterns and behaviours that provide input for long term roadmap to reach sustainability goals.

The project focused on organic waste in residual bins, disposable cups contaminating recycling, and liquids or full bottles making PMD bags wet and heavy.

Success criteria

Identify waste hotspots and problem items.
Test small scale actions and identify the direct impact.
Improve sorting, reduce contamination and support safer and more efficient collection.

03 APPROACH (HOW WE TESTED)

Test set-up & method

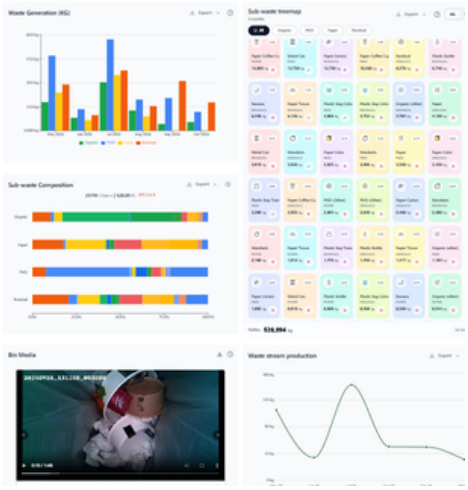
Perform manual waste scans to set a baseline.

Install monitoring equipment including 'smart technologies' and artificial intelligence software to define patterns, behaviour and detailled waste flows.

Trial small scale actions, focussed on specific behaviours on pre-determined locations. Asses the impact of the action. Determine the large scale potential.

Actions deployed were a.o: include fourth organic fraction, apple shaped organic lid, visual nudging, cup-specific signs, dedicated cup bins and liquid-station signs at airport locations.

Data & measurement



Total items collected by AI-camera's: 226,174 items valid
Main measurements: item sorting rate, fraction contamination, weight and volume measurement.

Risks & mitigations

A data driven approach is based on adequate and representative data.

Legacy systems provide a challenge to installing detection and monitoring equipment on existing infrastructure.

Limitations

Extracting results from small scale testing provides high level insights but is limited and subject to changes over time and locations.

Current infrastructure can provide limitations for full scale roll-out potential.

04 RESULTS & IMPACT

Key results

The study recorded 226,174 valid items. Overall sorting increased to 57.0% correct selective sorting rate.

Adding an organic bin raised median daily organic sorting to 89.6%, while a shaped lid cut organic-bin contamination by 25.3 percentage points.

Cup-specific signs raised correct cup sorting from 36.1% to 48.7%.

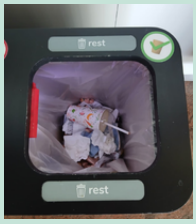
Full signage was linked to 47% higher measured use of liquid-emptying stations, but scans did not confirm less liquid in PMD fraction.

Broad signs and a 3D stand were inconsistent.
The main lesson is to combine the right bin set-up, restrictive openings and short, item-specific messages for each location.















05 RATINGS (QUICK ASSESSMENT)

Deployment Approach

How standardised is the solution: can it be deployed off the shelf, or does it require extensive customization?

Off The Shelf — Custom-Built

Investment Magnitude

From low-cost deployment to major investment.

Low Investment (less than €10k) — High Investment (more than €15mio)

OPEX ■ □ CAPEX

Sector Readiness

From non-existing or emerging standards, regulations, and certification pathways to fully established industry practices.

Emerging Framework — Established Framework

Innovation Maturity

How does the solution score in terms of maturity, from low TRL experimental/pilot-stage to high TRL market-ready.

Experimental — Market-Ready

Operational Impact

Does the innovation deliver targeted improvements or rather drastically transform processes and/or operations.

Incremental Improvement — Transformational Change

Notes

Infrastructure and technology is readily available. Setup should be backed up by deliberate actions and holistic framework to ensure succes on large scale.

06 NEXT STEPS / RECOMMENDATION

Recommendation

Adopt a data driven approach as a baseline for future actions to achieve set goals and ambitions.

Proceed with targeted roll-out: add organic bins with shaped openings where suitable, retain clear cup and bottle signs, and place cup and liquid facilities at the hotspots where these wastes arise.

Next steps

1) Adopt a data driven approach to provide objective measurements.

2) Divide the airport in different zones, define dedicated patterns and hotspots.

3) Focus on low effort - high impact actions to tackle location specific flows.

4) Coordinate with all stakeholders to establish a framework of ownership and long term roadmap to reach ambitions.