



PLASTICIRCLE SUSTAINABLE BUSINESS MODEL TO FOSTER CIRCULARITY

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61,8 M t
57,9 M t



16%



29,1 M t
50%



24,9%

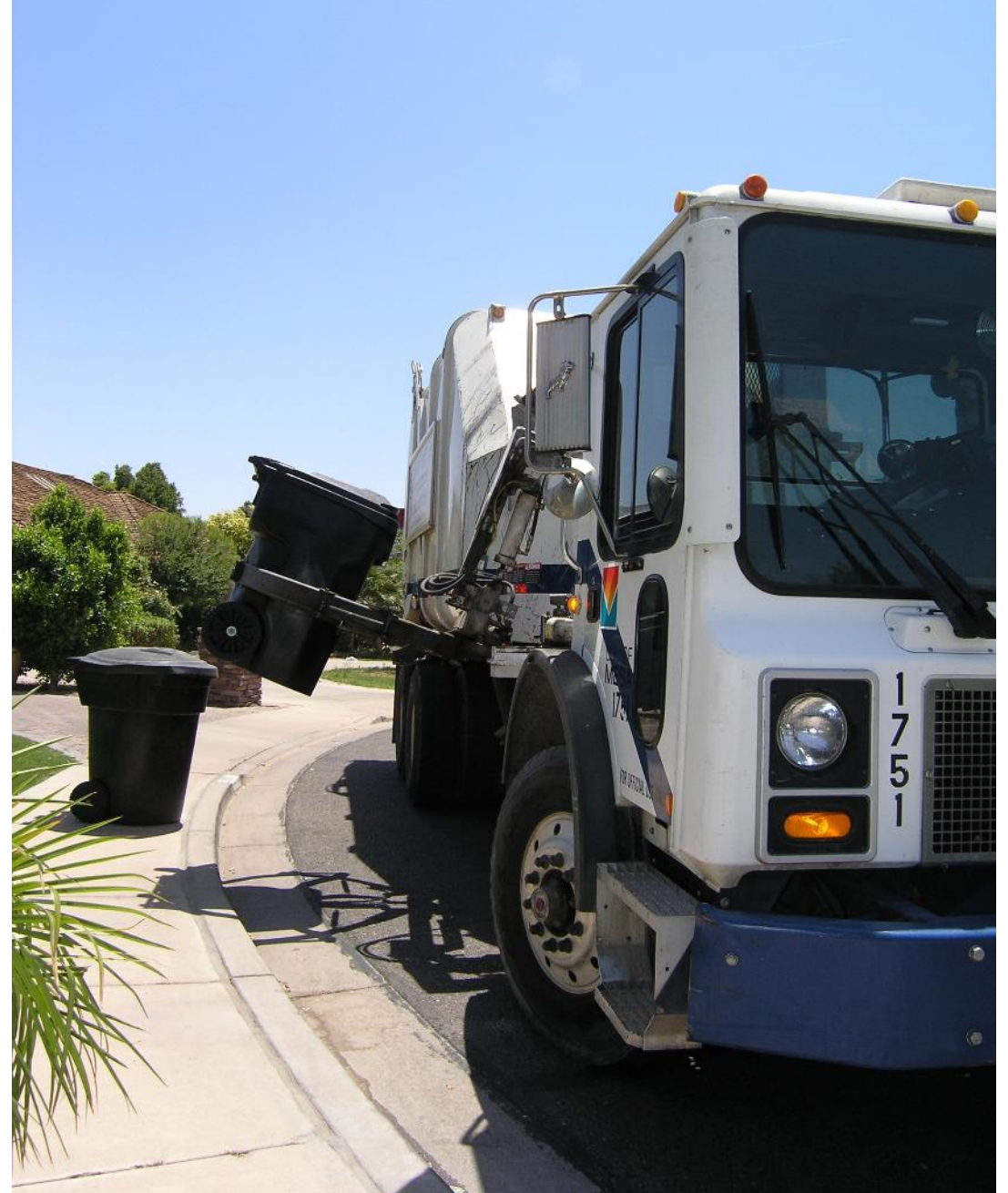


17,8 M t
61%



39,5%

Integral System of Smart Waste Management



MODULAR



ECONOMIC



EASY TO INSTALL





COLLECTION

Identification Module
for Smart Container

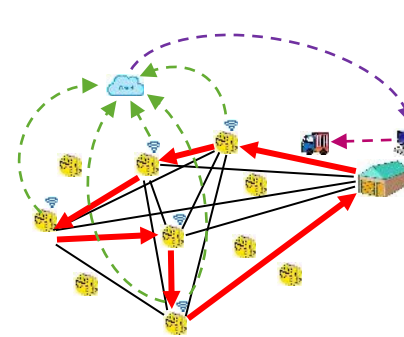
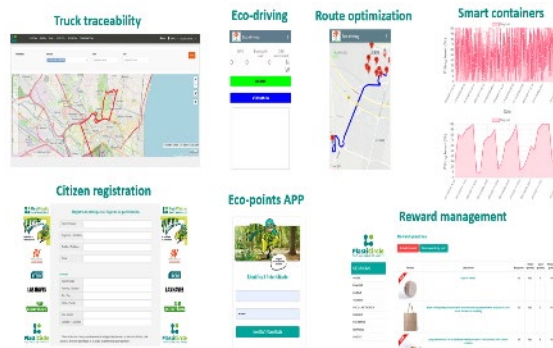


PAYT System



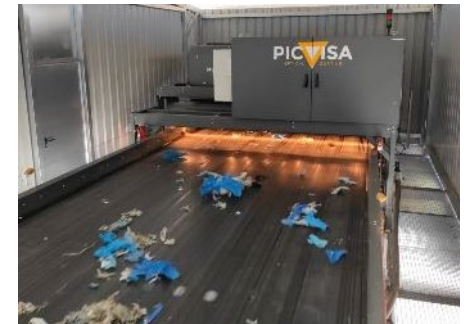
TRANSPORT

Route Optimization
Eco-Driving



SORTING

Optical technologies
Film Stabilising conveyor





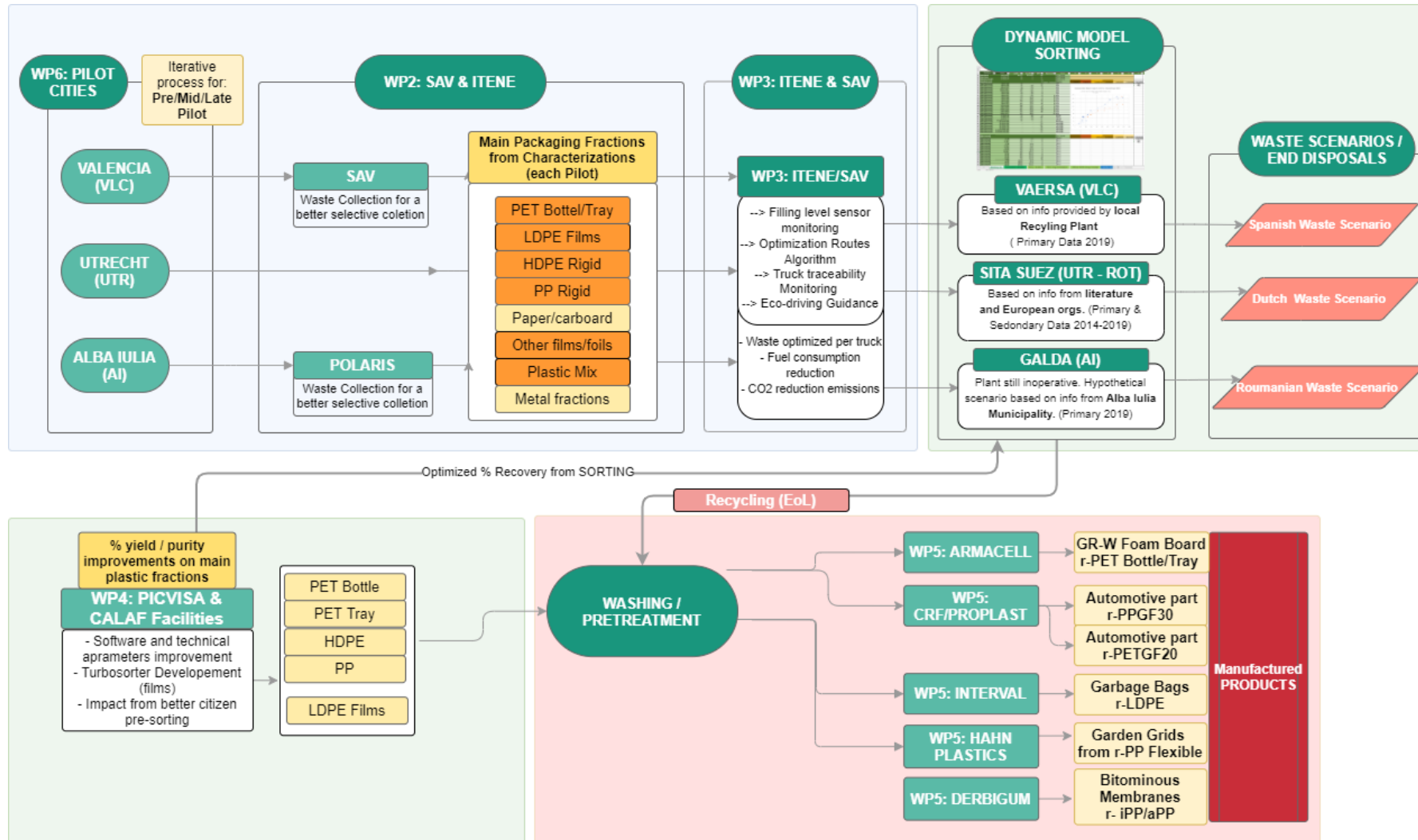
- Increase awareness of citizens
- Reduce CO2 emissions
- Increase recovered plastics





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PLASTICIRCLE DIRECT IMPACTS (Life Cycle Assessment)



IMPACTS EVALUATION – Methodology LCA / LCC / S-LCA

- Acknowledging actual impacts from a **better selective collection strategy**.
- Evidencing the impact from a **waste transport optimization**.
- **Yield recovery fraction of sorting** of certain plastics based on PC developed.



LCA - Environmental



LCC - Cost



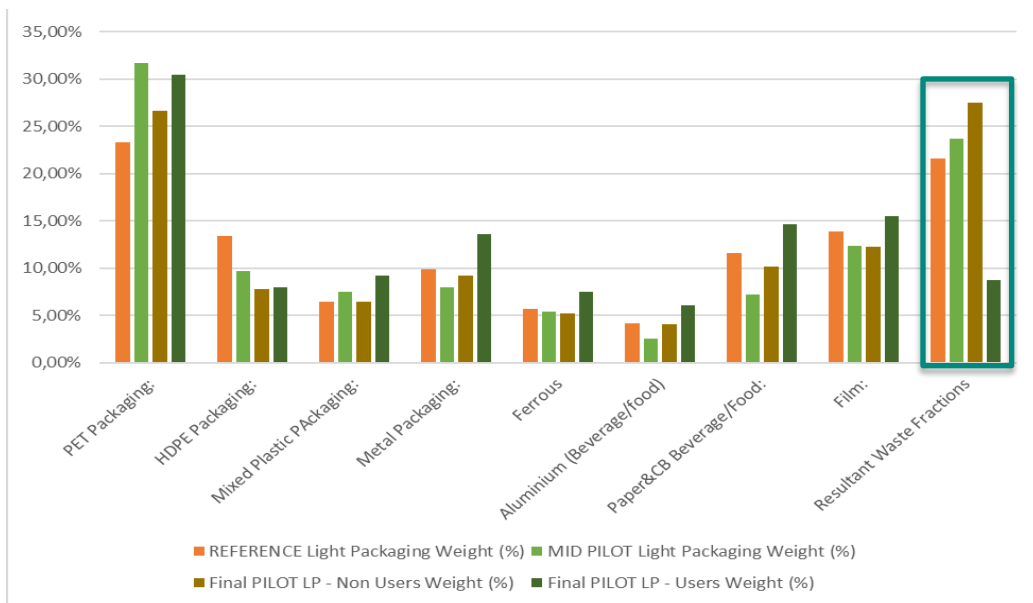
S-LCA - Social

Let's talk about Valencia Study Case!

PLASTICIRCLE SELECTIVE COLLECTION =

Improve quantity and quality of packaging waste collected

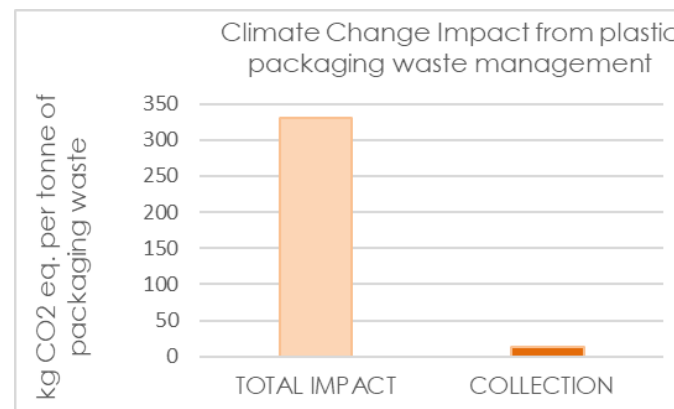
Composition of Waste Packaging	PlastiCircle Pre-Pilot	PlastiCircle Late-Pilot
Unwanted items/Other Waste	21,59%	8,71%



Characterisations results from Valencia pilot

COLLECTION

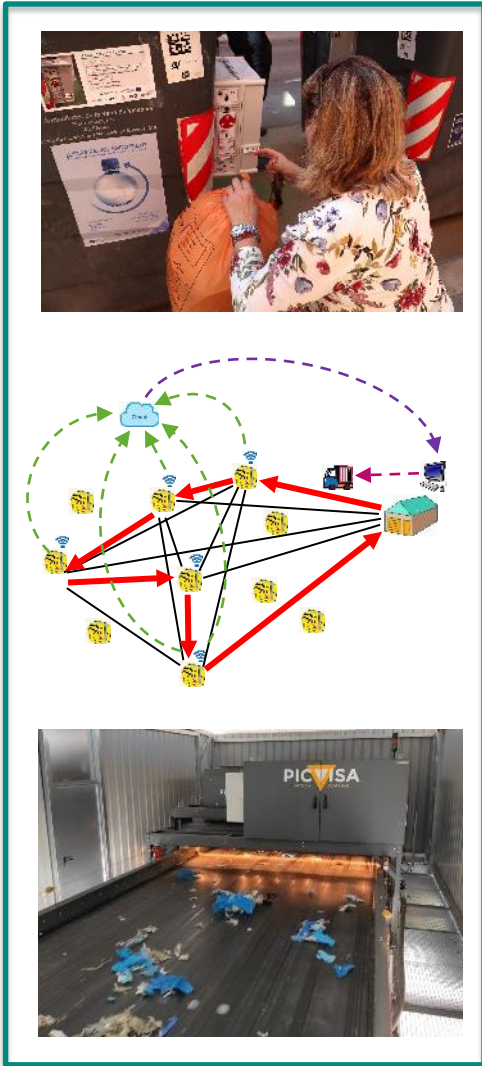
Installation of PlastiCircle Technologies has also been assessed (i.e use of NFC plastic cards or embeded energy on devices)



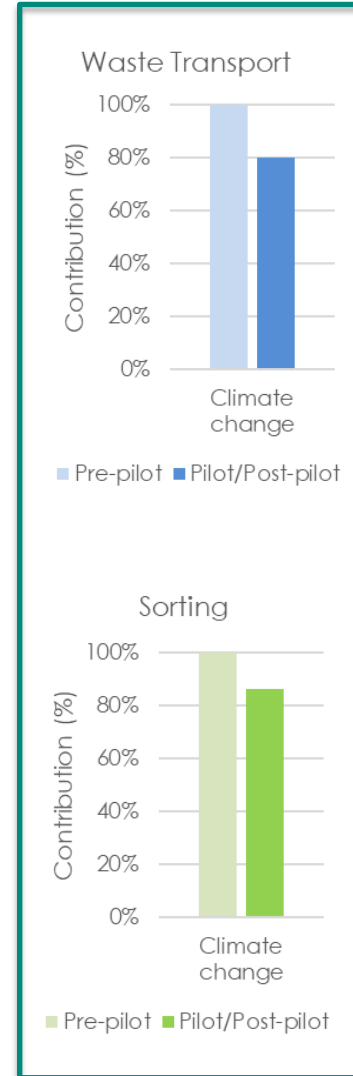
Representing less than 5% of total impact on collection to recycling value chain

PLASTICIRCLE TRANSPORT AND SORTING=

Improved distances travelled and sorting energy used



PlastiCircle technologies and strategies have a direct impact on different environmental categories



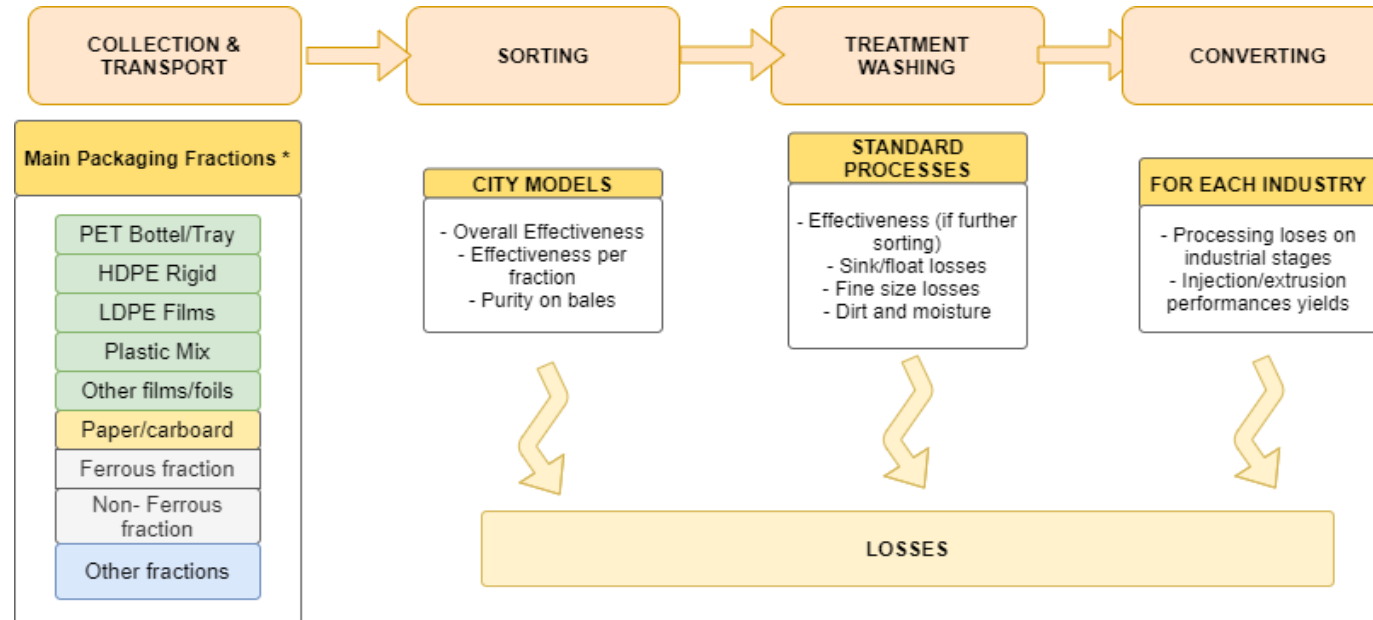
Valencia Pilot:

Saves on 20 % and 14 % for Transport and Sorting, respectively, on **Climate Change** Category



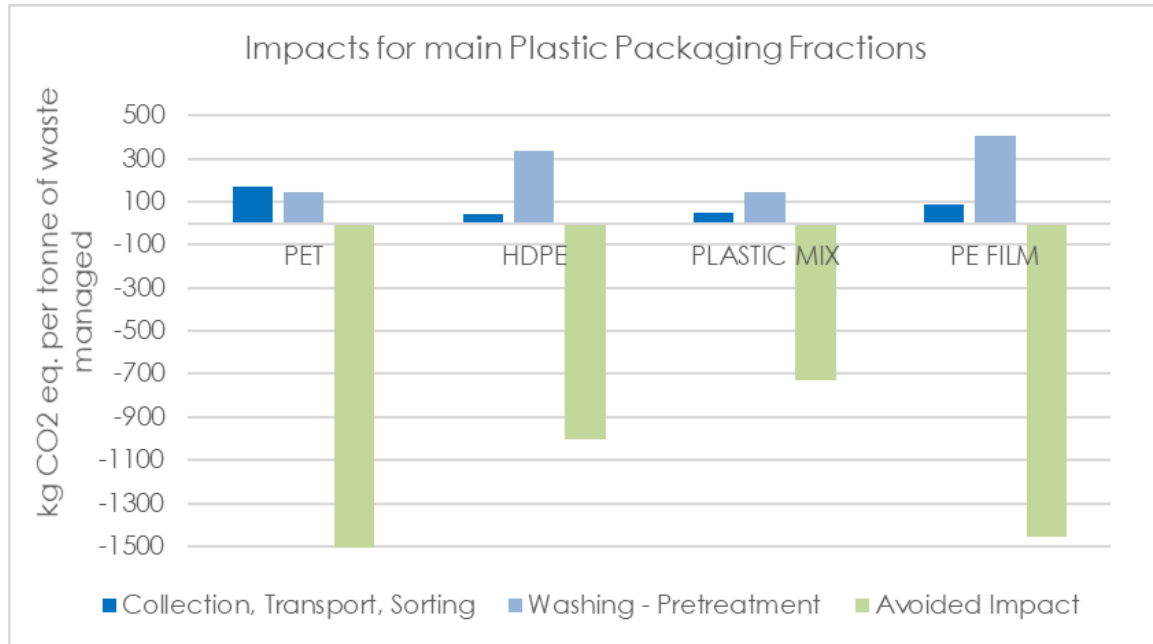
PLASTICIRCLE IMPACTS=

Contribution from plastic recycling strategies



Material losses and mass flow considerations:

Substitution factor of recycled material is not 1:1. Adjusted factors have been considered (0,40 - 0,75 depending on the type of fraction).



Own calculations from PlastiCircle Project

Per **each tonne of Plastic Packaging** Waste converted into pellets/flakes, we are saving around 900 kg CO₂eq.



- Emissions of 390 L of fuel consumed



- Emission by charging 114,779 Smartphones

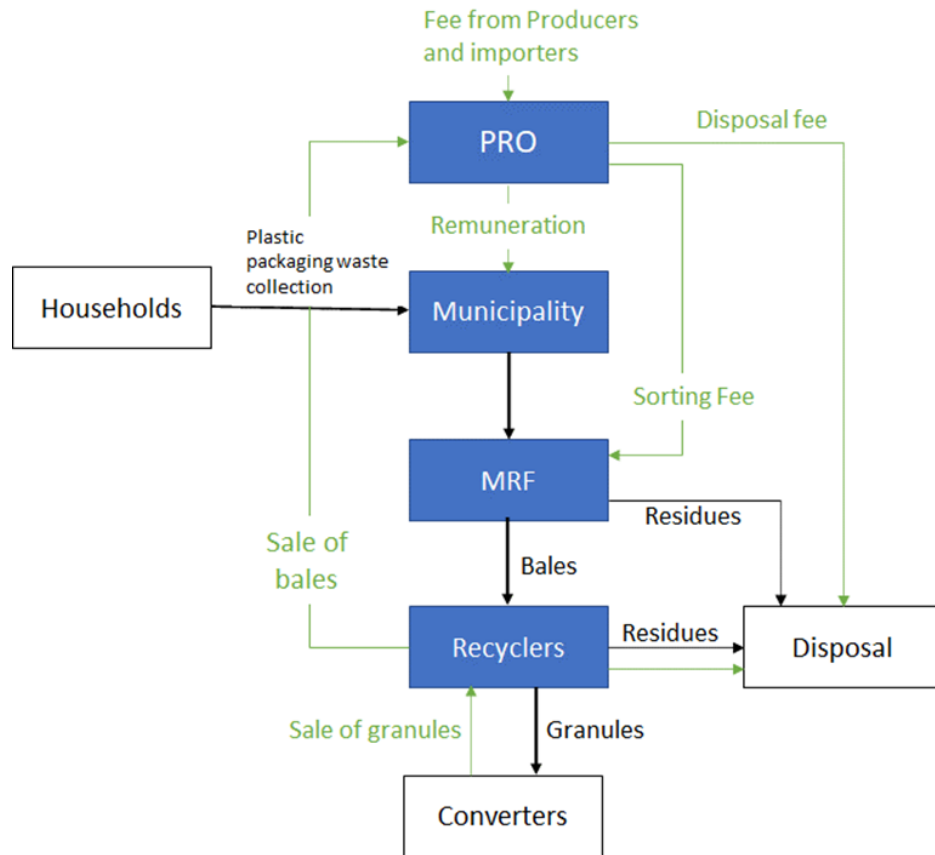


Equivalences from EPA Greenhouse Gas Calculator



**POTENTIAL
IMPACT &
OPORTUNITY**

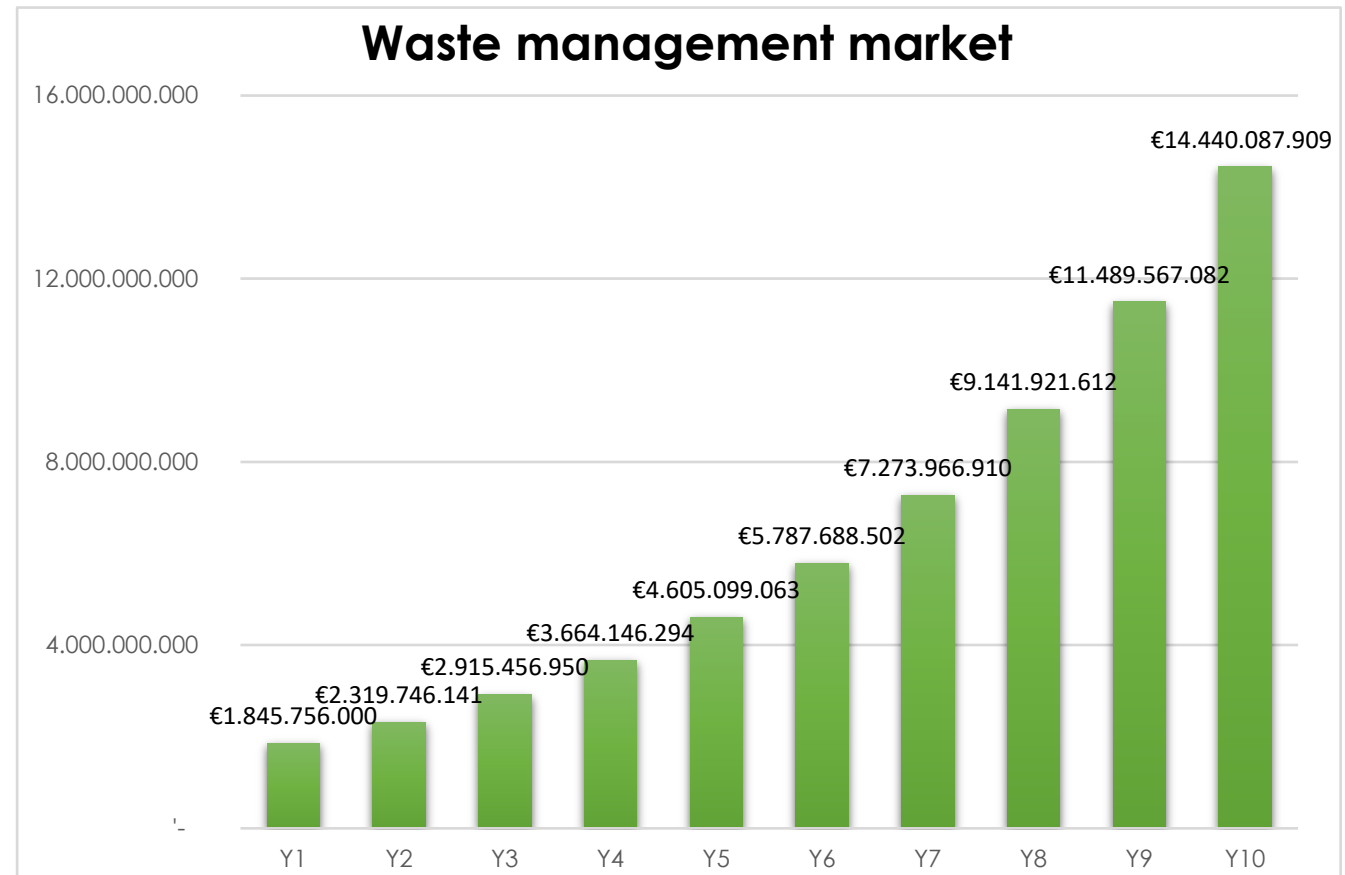
Valencia selectively collected
25.899,10 tons of Packaging Waste



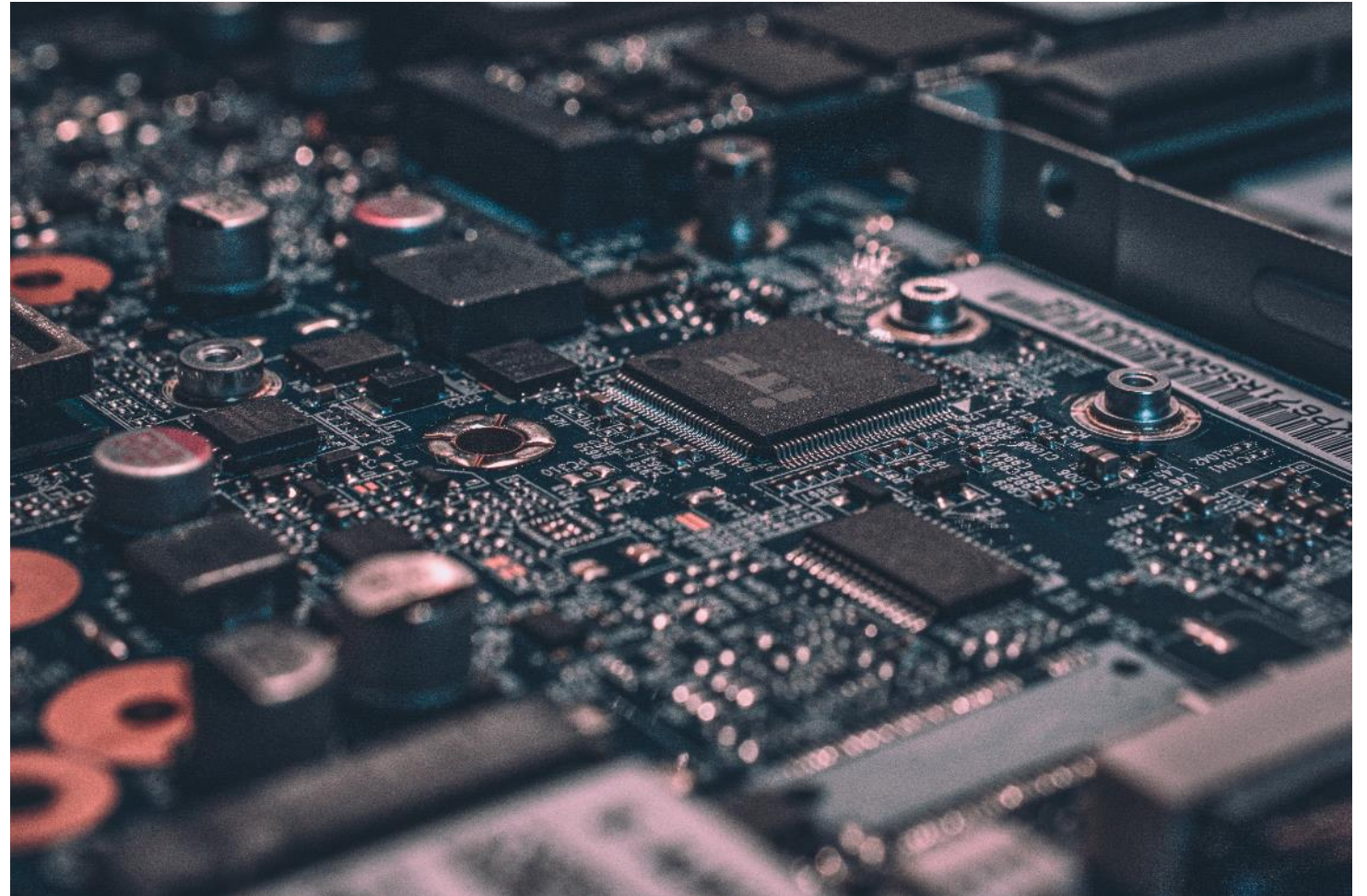
- Main stakeholders impacted → **municipalities, waste managers/MRF and recyclers.**
- **Investment on IoT devices** are compensated by reductions on fuel consumptions.
- The **higher volumes collected** caused higher management costs which are compensated by higher remuneration from the PRO.
- Improving recycling rates, **reduces landfilling/incinerations fees** (with upraising tendency)
- Improving **quality flow streams** directly affects **recyclers feedstock** and operational costs.

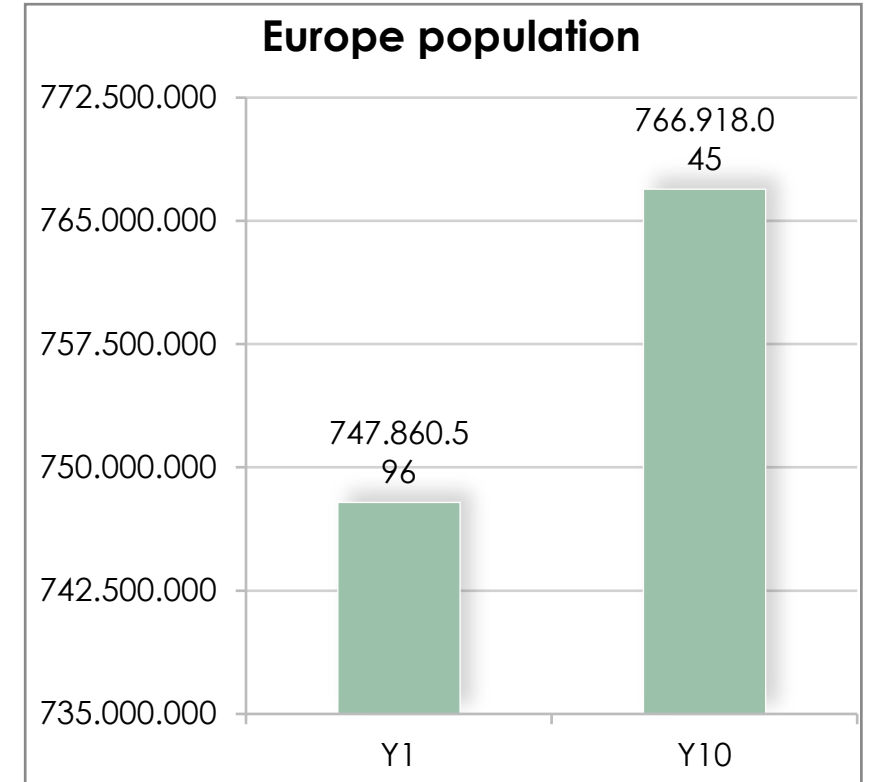
PLASTICIRCLE BUSINESS MODEL

TAM



- ✓ Smart City initiatives
- ✓ Sensor technologies
- Lack of efficient connectivity





Packaging waste 2018: 174 kg / hab



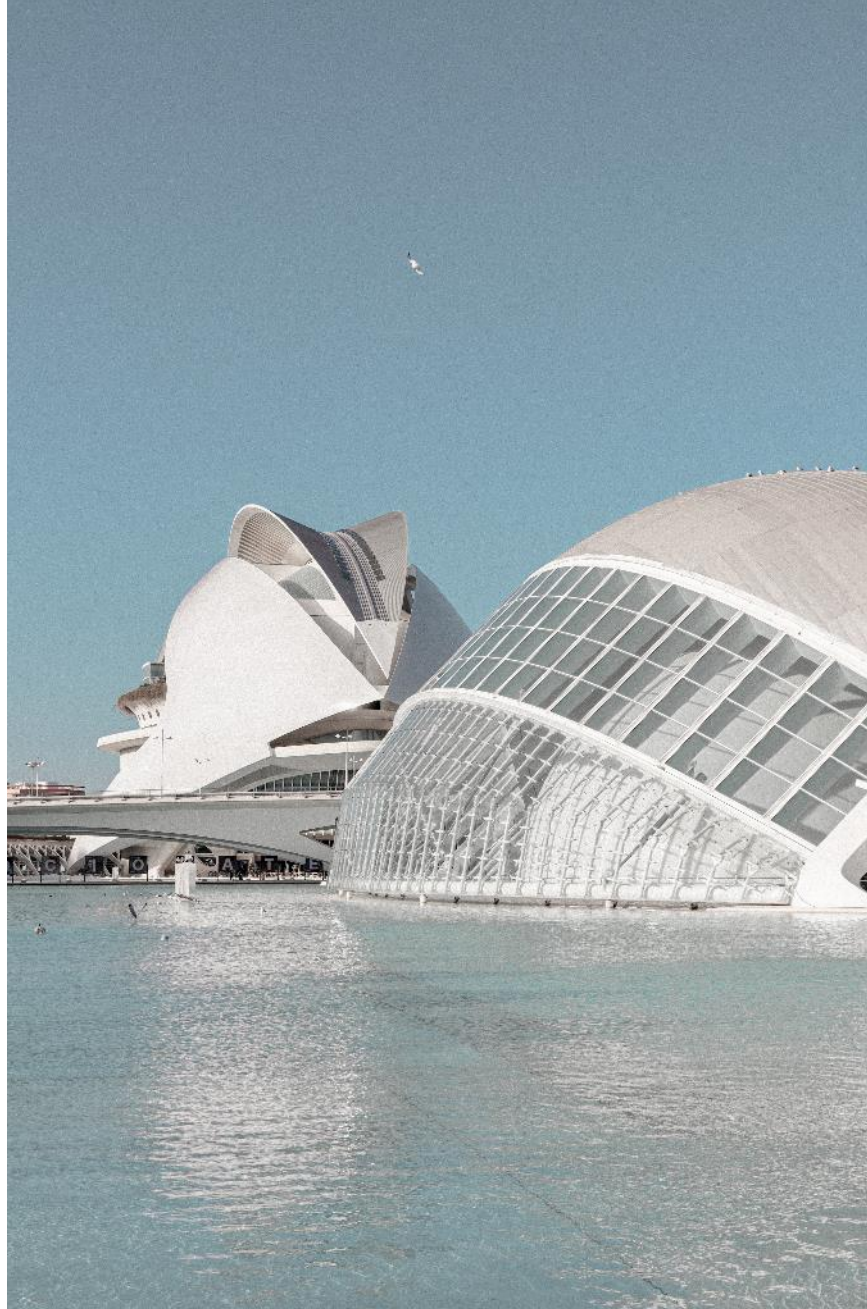
SOM

Population Spain 46.763.700 hab

Package waste generated in Spain 7.528.955,7 ton/y

Population Valencia 833.724 hab

Package waste generated in Valencia 271.877,4 ton/y



TARGET MARKET





PAYT system

Sorting facilities

Modular

IoT platform

Own sensor technologies

Digital solutions

Compensation procedure

Waste transfer terminal

Adaptable to each city

Underground collection network



Adaptability to different
waste management models

S

Growth potential in countries
with low recycling rates

O

W

Limited initial investment to
commercialise the system

T

High number of competitors



◉ Waste Management Contracts

◉ Post-consumer recovered plastic sales

	Y1	Y2	Y9	Y10
Waste Management Contracts	1.063.899 €	31.821.828 €	1.727.321.181 €	2.229.873.657 €
Sale of recycled Plastic	21.643 €	647.369 €	35.139.848 €	45.363.551 €
Total Revenues	976.988 €	29.222.278 €	1.586.214.927 €	2.047.713.487 €



Post-consumer recovered plastic

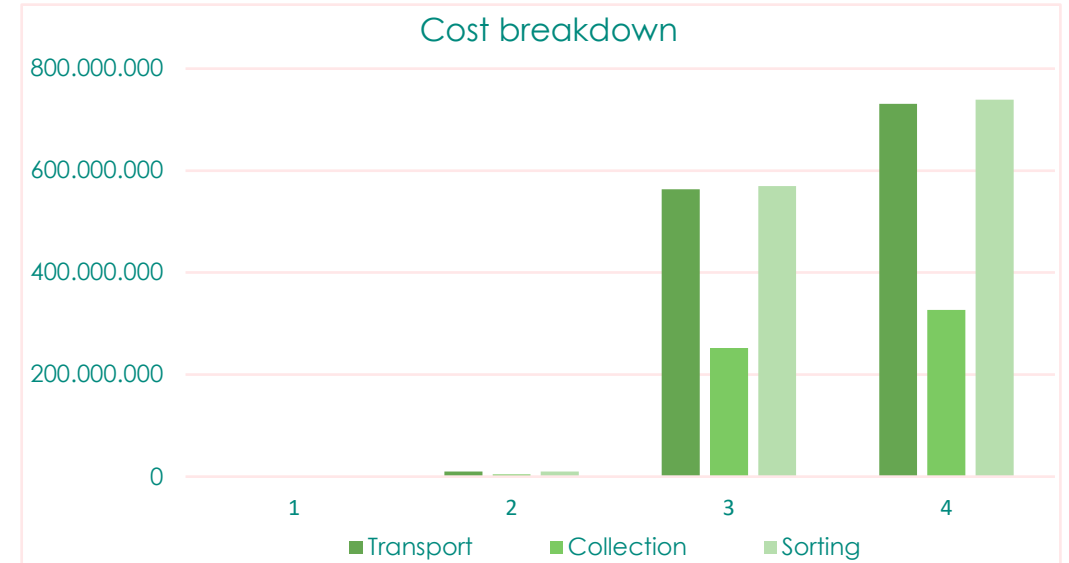
Package waste generated	Y1
Spain (ton/y)	7.528.956
Europe(ton/y)	130.127.744

Plastic Waste Generated	Y1
Valencia (kg/y)	27.187.740
Spain (kg/y)	1.449.674.700
Europe (kg/y)	23.183.678.476

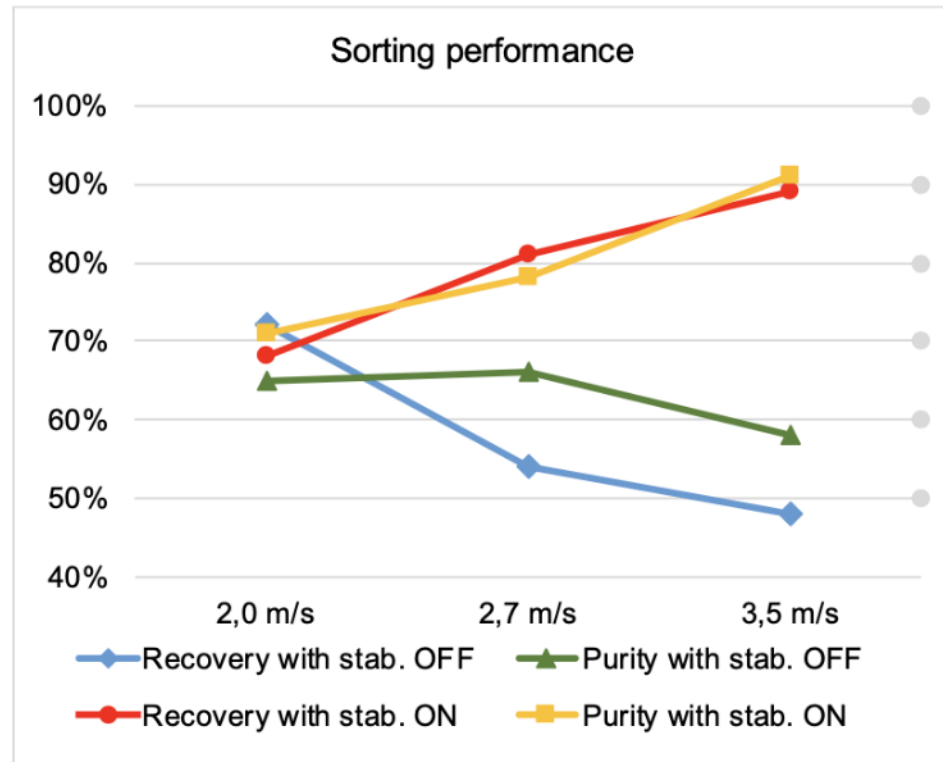
Plastic waste recycled	Y1
Valencia (kg/y)	18.341.928
Spain (kg/y)	1.028.801.400
Europe (kg/y)	16.452.933.112

	Pre-Valencia	Post-Valencia
Collection	2,46 €	3,33 €
Transport	2,10 €	1,49 €
Sorting	3,37 €	3,37 €
TOTAL	7,92 €	8,18 €

Capex+Opex per inhabitant per month
Units: €/cap.a



	Y1	Y2	Y9	Y10
Transport	333.156 €	10.014.969 €	563.035.826 €	730.499.811 €
Collection	149.070 €	4.481.172 €	251.928.943 €	326.860.276 €
Sorting	337.158 €	10.135.269 €	569.799.019 €	739.274.583 €
Total COGS	819.384 €	24.631.411 €	1.384.763.789 €	1.796.634.670 €



Conveyance speed	Stabilisation belt	Recovery	Purity
3,5 m/s	ON	89%	91%



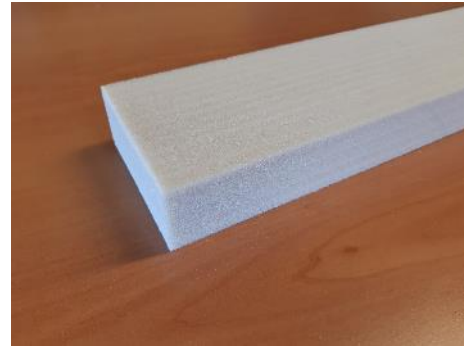
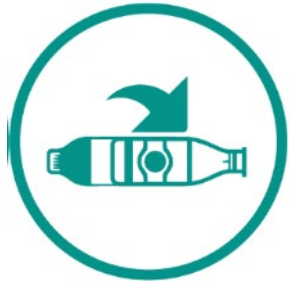
Sensitivity analysis: different profitability margins and different levels of risk.

Sensitivity Analysis				
Prudence		Optimist 30%	Neutral 0%	Pesimist -30%
Margins	20%	478.539.992 €	368.107.686 €	257.675.380 €
	30%	890.397.595 €	684.921.227 €	479.444.859 €
	40%	1.302.255.199 €	1.001.734.768 €	701.214.338 €

PLASTICIRCLE FINAL PRODUCTS



Recovery



Foam boards



Ground reinforcement grid



Bituminous waterproofing membrane



Laundry bags



Automotive bracket



Automotive central console bracket

Shoes and clothing

Leisure

Roads

Collection units and bins

Garden Furniture

Houseware

Landscaping

Office Supply

Packaging products

PLASTICIRCLE OUTCOMES



Improvement of quantity & quality of plastic waste collected.



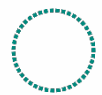
Increase in yield and purity of bales.



Smart Waste Management systems.



Helps us to reduce environmental impact.



Cost neutral recycling scheme for post-consumer plastic.



Collaboration of all stakeholders.



Prices of recycled materials.



Need to be stabilised to generate secure and competitive material flows.



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