The ideal aluminium packaging sorting model

HTP Consultancy studies (2018-2019 - general and extension for smaller sorting centres, carried out for the European Aluminium Packaging Group

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EUROPEAN ALUMINIUM

The ideal aluminium packaging sorting model – a study by HTP Consultancy, commissioned by EAPG in 2018/19

(follow up EAPG 2016 study on best collection and sorting practices)

Aims of the study

1) Develop a sorting calculation model for aluminium packaging which is reasonably simple but technically accurate.

- **Calculate recycling rates based on certain assumptions** like technical inventories, capacities etc. and with respect to all aluminium packaging groups (Beverage cans, Aerosols, food cans and menu trays, Tubes, closures and capsules and Other aluminium foil based packaging)

2) Develop a cost model which structures and identifies the total and incremental cost when applying certain technical measures:

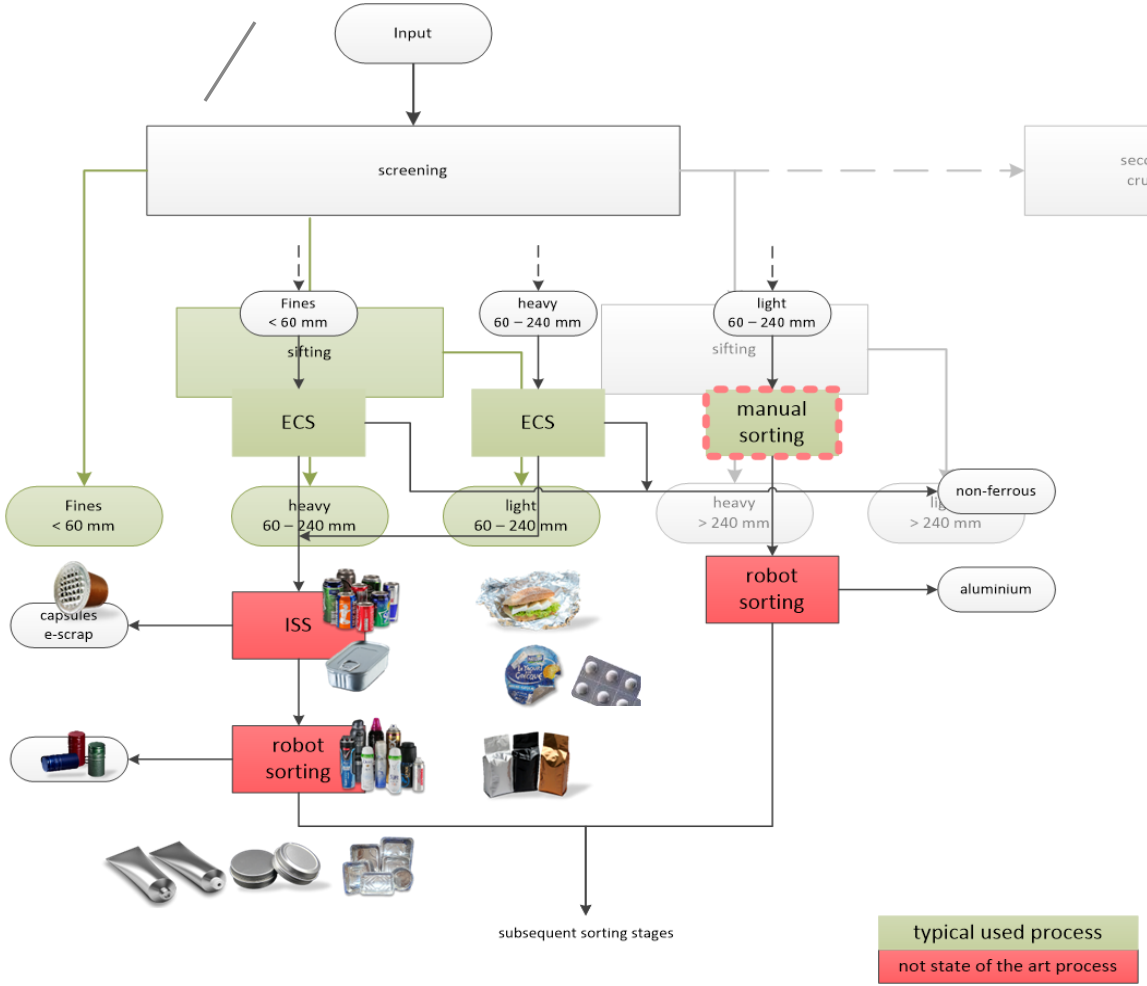
- capital & operational expenditures needed to process a certain waste stream independently from its composition (feeding and screening devices, sorting cabin, balers etc.)
- capital & operational expenditures needed to sort a particular packaging material (Eddy Current, NIR-sorter, etc.), cost gap to retrofit a sorting installation with deficits to a state of the art installation.

- **Disseminate the results via publications and 'round table' talks with EPR organisations, sorting plants and local authorities (Spain, Denmark and Austria, others)**

	Material stream MSW sorting	Material stream PMD sorting	Comments on sortability
	medium 60-240mm, heavies	medium-low 80-200, heavies	Easy to sort, high Al content
	fines < 60mm	Fines 20 – 80mm	Eddy-currents might not be strong enough to eject the capsules due to the weight of the wet content. Multi pole eddy-current can potentially eject capsules.
	medium 60-240mm, heavies	medium-low 80-200, heavies medium 200-320, heavies	Easy to sort, high Al content
	fines < 60mm	Super-fine < 20mm fines 20-80mm	Easy to sort, high Al content
	fines < 60mm	fines 20-80mm	Easy to sort, high Al content
	fines < 60mm	fines 20-80mm	thickness of Al-foil is decisive ! Variant 1: Al-fraction via ECS Variant 2: Mixed plastics via NIR-sorter
	Medium 60-240mm	medium-low 80-200 medium 200-320	Easy to sort, high Al content
	Medium 60-240mm, lights ☒	medium-low 80-200, lights medium 200-320, lights	Multilayer-structure is decisive Variant 1: Al-fraction via NIR-sorter + ECS Variant 2: Mixed plastics via NIR-sorter
	fines < 60mm Medium 60-240mm, lights ☒	fine 20-80mm medium-low 80-200, lights	thickness of Al-foil is decisive ! Variant 1: Al-fraction via ECS Variant 2: Mixed plastics via NIR-sorter
	Medium 60 – 240mm, lights ☒	medium-low 80-200, lights	thickness of Al-foil is decisive ! Variant 1: Al-fraction via ECS Variant 2: Mixed plastics via NIR-sorter
	Medium 60 – 240mm, lights ☒	fine 20-80mm medium-low 80-200, lights	thickness of Al-foil is decisive ! Variant1: Al-fraction via ECS Variant 2: Light fraction with optional AL sorting steps

The different routes of used and collected packaging in a sorting centre (Municipal Solid Waste or PMD)

☒ not sortable in MSW



General process-flow diagram

<u>< 60 mm and < 240 mm (heavy):</u>

- **Eddy-current separation**
- **Inductive Sensor sorting**
- **Robot sorting**

<u>< 240 mm (light):</u>

- **Manual sorting**
- **Robot sorting**

Aluminium sorting model for three extension stages

A simplified mass balance has been elaborated to demonstrate the path of aluminium in a simplified sorting plant related to the process flow diagrams mentioned before. The model provides an overview of the different extension stages.

MSW Plant

Stage	Fines < 60	Heavy 60-240	Light 60-240
Stage 0 (One ECS)	-	✓	-
Stage 1 (Two ECS)	✓	✓	-
Stage 2 (Two ECS + ISS)	✓	✓	-
Stage 3 (Two ECS + Robot)	✓	✓	✓

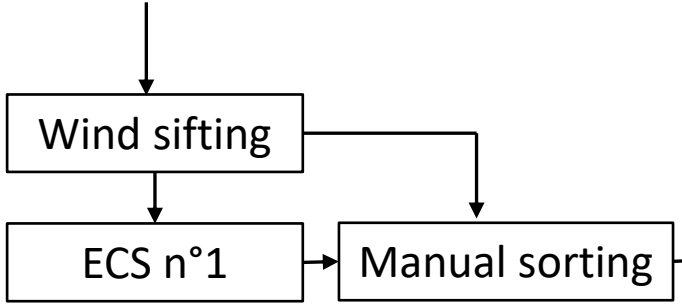
PMD Plant

Stage	Super fine < 20	Fine 20 - 80	Medium-low 80-200	Medium 200-300	2D-material
Stage 0 (One ECS)	-	-	✓	✓	-
Stage 1 (Three ECS)	-	✓	✓	✓	-
Stage 2 (Three ECS + ISS)	-	✓	✓	✓	-
Stage 3 (Three ECS + Robot)	-	✓	✓	✓	✓

Sorting model stage 0 - MSW

In this case (Stage 0) only one ECS is installed in the sorting plant. This could be the case in smaller and less modern sorting centres. The normal base case in MSW facilities is an ECS in the fine and mid-range material stream.

Stage	Fines < 60 mm	Heavy 60-240 mm	Light 60-240 mm
0	-	✓	-

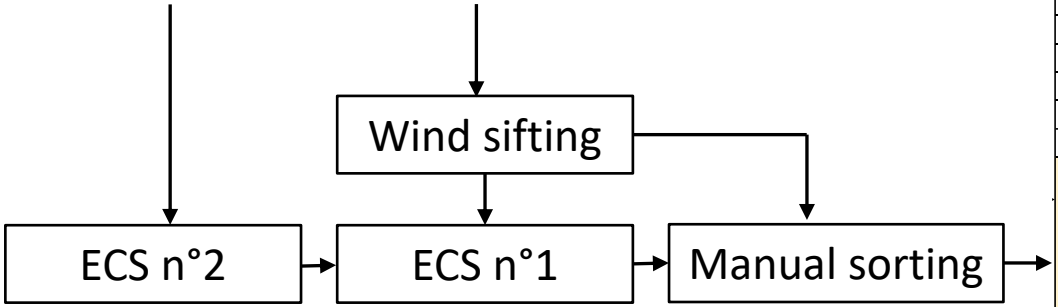


Output non-ferrous			
Ferrous		0,03%	
Film		0,04%	
Plastics		0,67%	
beverage cartons		18,53%	
Organics		0,03%	
Residues		0,30%	
non-ferrous	beverage cans	59,57%	53,29%
	aerosols	4,26%	
	foodcans	71,61%	
	menu trays	63,48%	
	tubes	7,05%	
	closures, capsules	3,58%	
	other foil based packaging	20,05%	

Sorting model stage 1 - MSW

In this case (Stage 1) ECS are installed in the fine and mid-range material stream. This should be the minimum configuration for aluminium separation out of MSW. **Difference between an additional ECS for the fine fraction: approximately + 29 % !**

Stage	Fines < 60 mm	Heavy 60-240 mm	Light 60-240 mm
1 (two ECS)	✓	✓	-

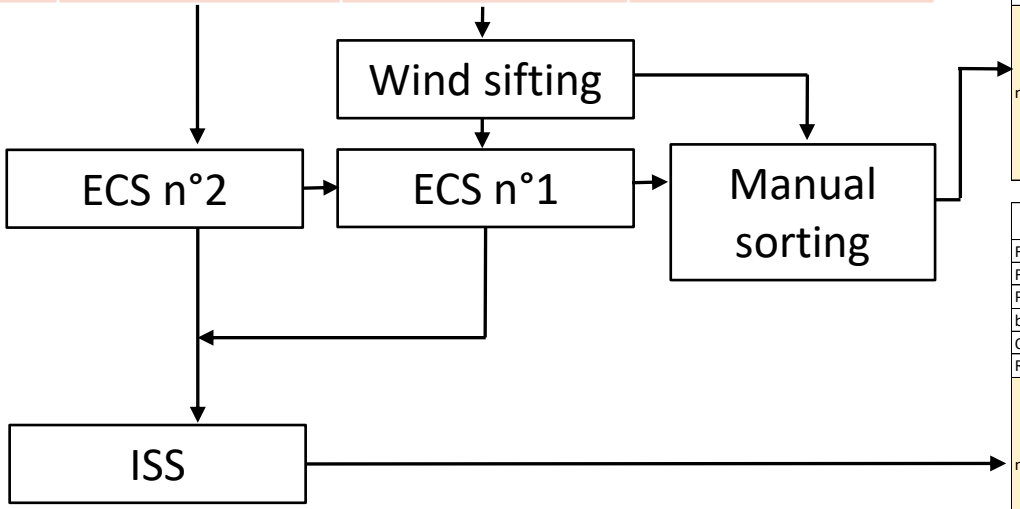


Output non-ferrous			
Ferrous		0,03%	
Film		0,09%	
Plastics		0,82%	
beverage cartons		19,78%	
Organics		0,24%	
Residues		0,55%	
non-ferrous	beverage cans	85,07%	82,41%
	aerosols	85,01%	
	foodcans	84,36%	
	menu trays	69,98%	
	tubes	65,55%	
	closures, capsules	65,33%	
	other foil based packaging	39,30%	

Sorting model stage 2 - MSW

In addition to the ECS in the fine and heavy fraction an ISS is added. Light and flat material items which could not be extracted by ECS can be removed easily by ISS. Remaining items of the ECS stage can also be removed, resulting in an **additional aluminium recovery of 10.44% compared to stage 1.**

Stage	Fines < 60 mm	Heavy 60-240 mm	Light 60-240 mm
2 (two ECS + ISS)	✓	✓	-



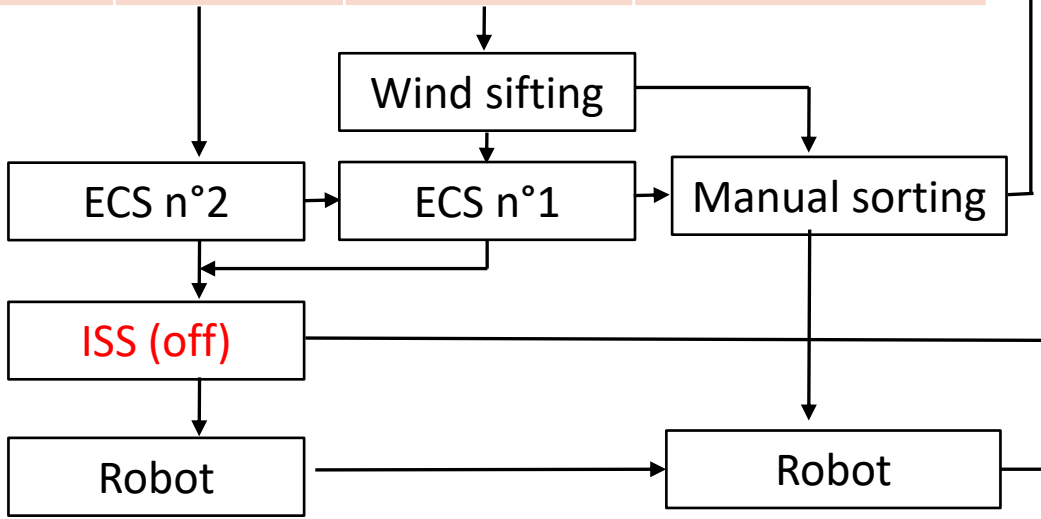
Output non-ferrous			
Ferrous		0,03%	
Film		0,09%	
Plastics		0,82%	
beverage cartons		19,78%	
Organics		0,24%	
Residues		0,55%	
non-ferrous	beverage cans	85,07%	82,41%
	aerosols	85,01%	
	foodcans	84,36%	
	menu trays	69,98%	
	tubes	65,55%	
	closures, capsules	65,33%	
	other foil based packaging	39,30%	

Output ISS			
Ferrous		0,00%	
Film		0,09%	
Plastics		0,20%	
beverage cartons		5,93%	
Organics		0,24%	
Residues		0,21%	
non-ferrous	beverage cans	8,94%	10,44%
	aerosols	9,00%	
	foodcans	8,85%	
	menu trays	17,34%	
	tubes	20,59%	
	closures, capsules	20,76%	
	other foil based packaging	34,48%	

Sorting model stage 3 - MSW

In addition to the ECS in the fine and heavy fraction an additional Robot sorter is added. Depending on the material a robot sorter could be an alternative sorting machine. It should be used in material streams with a reduced throughput.

Stage	Fines < 60 mm	Heavy 60-240 mm	Light 60-240 mm
3 (two ECS + Robot)	✓	✓	✓



Output non-ferrous			
Ferrous		0,03%	
Film		0,09%	
Plastics		0,82%	
beverage cartons		19,78%	
Organics		0,24%	
Residues		0,55%	
non-ferrous	beverage cans	85,07%	82,41%
	aerosols	85,01%	
	foodcans	84,36%	
	menu trays	69,98%	
	tubes	65,55%	
	closures, capsules	65,33%	
	other foil based packaging	39,30%	

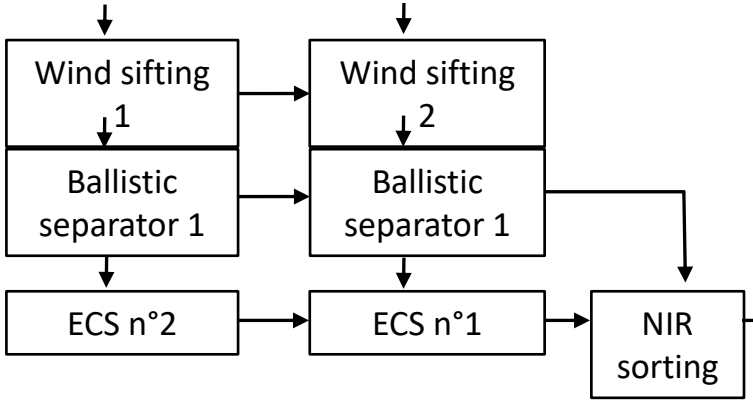
Output ISS			
Ferrous		0,00%	
Film		0,00%	
Plastics		0,00%	
beverage cartons		0,00%	
Organics		0,00%	
Residues		0,00%	
non-ferrous	beverage cans	0,00%	0,00%
	aerosols	0,00%	
	foodcans	0,00%	
	menu trays	0,00%	
	tubes	0,00%	
	closures, capsules	0,00%	
	other foil based packaging	0,00%	

Output Robot sorting			
Ferrous		0%	
Film		0%	
Plastics		0%	
beverage cartons		0%	
Organics		0%	
Residues		0%	
non-ferrous	beverage cans	7,46%	8,74%
	aerosols	7,50%	
	foodcans	7,39%	
	menu trays	14,54%	
	tubes	17,17%	
	closures, capsules	17,33%	
	other foil based packaging	29,85%	

Sorting model stage 0 - PMD

In this case (Stage 0) only the ECS in the medium fraction is installed in the sorting plant. This could be the case in smaller and less modern sorting centres. The normal base case in PMD facilities is one ECS in the fine stream and a second in the medium material stream, resulting into a sorting result of nearly 60%.

Stage	Super fine < 20 mm	Fine 20 – 80 mm	Medium-low 80-200 mm	Medium 200-300 mm	2D-material
0	-	-	✓	✓	-

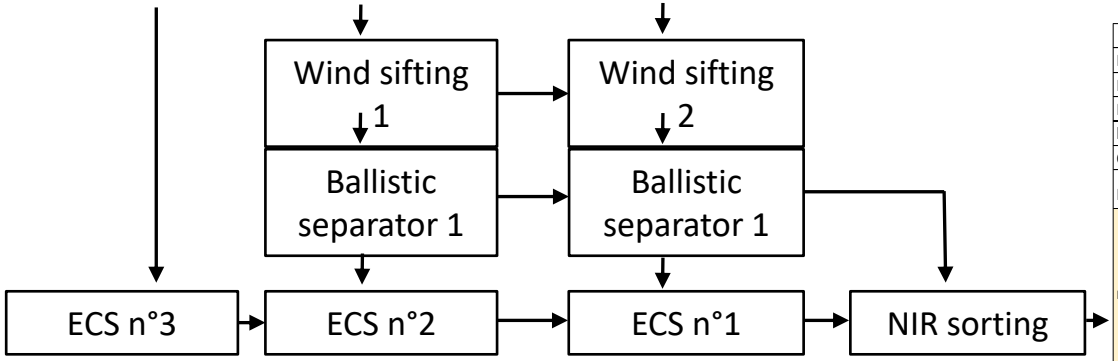


Output non-ferrous			
Ferrous		0,02%	
Film		0,00%	
Plastics		0,33%	
beverage cartons		59,11%	
Organics		0,01%	
Residues		0,03%	
non-ferrous	beverage cans	54,84%	59,19%
	aerosols	4,70%	
	foodcans	79,94%	
	menu trays	74,81%	
	tubes	7,79%	
	closures, capsules	3,63%	
	other foil based packaging	17,18%	

Sorting model stage 1 - PMD

In this case (Stage 1) one ECS is installed in the fine stream and another one in the mid-range material stream. This should be the minimum configuration for aluminium separation out of PMD. **Difference between an extra ECS in fine fraction: approx. + 30 %**

Stage	Super fine < 20 mm	Fine 20 – 80 mm	Medium-low 80-200 mm	Medium 200-300 mm	2D-material
1	-	✓	✓	✓	-

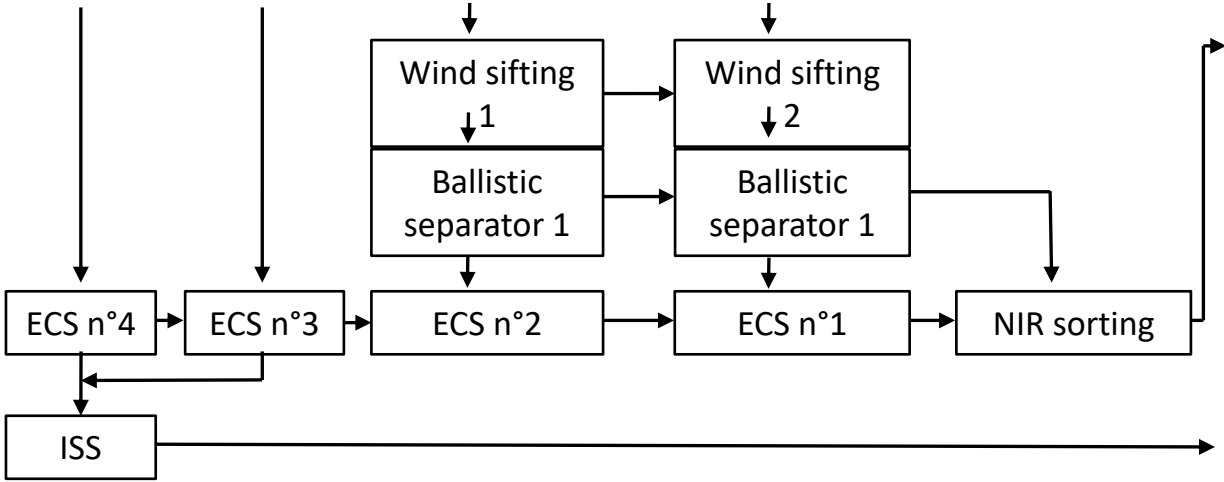


Output non-ferrous			
Ferrous		0,02%	
Film		0,06%	
Plastics		0,71%	
beverage cartons		62,86%	
Organics		0,06%	
Residues		0,12%	
non-ferrous	beverage cans	92,84%	89,91%
	aerosols	90,20%	
	foodcans	93,44%	
	menu trays	81,31%	
	tubes	70,79%	
	closures, capsules	75,83%	
	other foil based packaging	33,54%	

Sorting model stage 2 - PMD

In addition to the ECS in the fine and heavy fraction an ISS is added. Light and flat material items which could not be extracted by ECS can be removed easily by the ISS. Remaining items of the ECS stage can also be removed, **generating an extra 4%**

Stage	Super fine < 20 mm	Fine 20 – 80 mm	Medium-low 80-200 mm	Medium 200-300 mm	2D-material
2	✓	✓	✓	✓	-



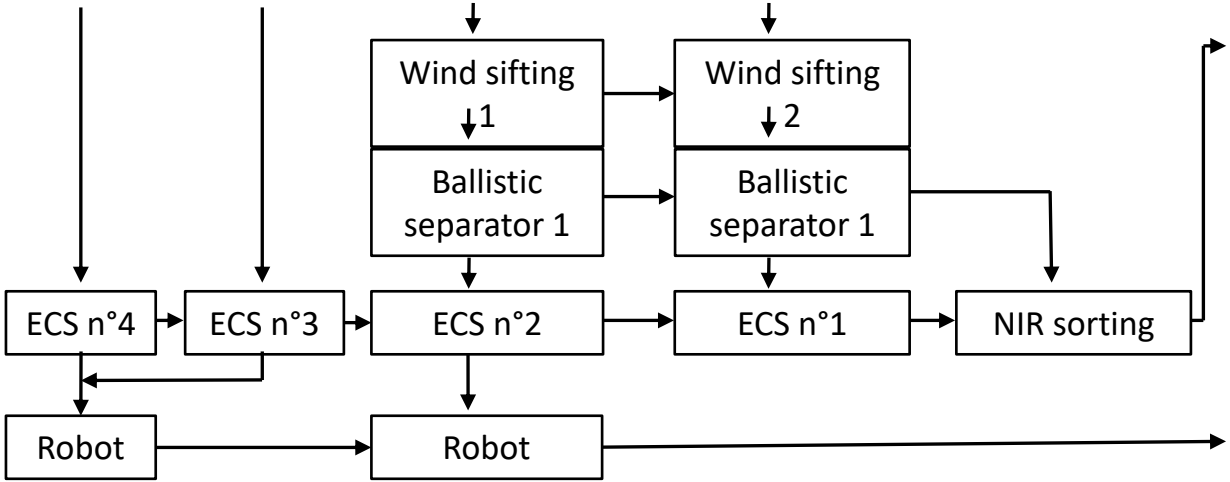
Output non-ferrous			
Ferrous		0,02%	
Film		0,06%	
Plastics		0,71%	
beverage cartons		62,86%	
Organics		0,06%	
Residues		0,12%	
non-ferrous	beverage cans	92,84%	89,91%
	aerosols	90,20%	
	foodcans	93,44%	
	menu trays	81,31%	
	tubes	70,79%	
	closures, capsules	75,83%	
	other foil based packaging	33,54%	

Output ISS			
Ferrous		0,00%	
Film		0,08%	
Plastics		0,11%	
beverage cartons		1,13%	
Organics		0,23%	
Residues		0,23%	
non-ferrous	beverage cans	2,55%	4,33%
	aerosols	8,08%	
	foodcans	1,28%	
	menu trays	2,98%	
	tubes	22,95%	
	closures, capsules	17,29%	
	other foil based packaging	31,77%	

Sorting model stage 3 - PMD

In addition to the ECS in the fine and heavy fraction an Robot sorter is added. Depending on the material a robot sorter could be an alternative sorting machine. It should be used in material streams with a reduced throughput. **Additional sorting result of 6%.**

Stage	Super fine < 20 mm	Fine 20 – 80 mm	Medium-low 80-200 mm	Medium 200-300 mm	2D-material
3	✓	✓	✓	✓	-



Output non-ferrous			
Ferrous		0,02%	
Film		0,06%	
Plastics		0,71%	
beverage cartons		62,86%	
Organics		0,06%	
Residues		0,12%	
non-ferrous	beverage cans	92,84%	89,91%
	aerosols	90,20%	
	foodcans	93,44%	
	menu trays	81,31%	
	tubes	70,79%	
	closures, capsules	75,83%	
	other foil based packaging	33,54%	

Output Robot sorting			
Ferrous		0%	
Film		0%	
Plastics		0%	
beverage cartons		0%	
Organics		0%	
Residues		0%	
non-ferrous	beverage cans	4,54%	6,26%
	aerosols	7,29%	
	foodcans	3,91%	
	menu trays	10,98%	
	tubes	21,47%	
	closures, capsules	17,85%	
	other foil based packaging	32,50%	

Detailed cost comparison

Stage 1

Description	Total
Total Conveyor Technology	**944.250 €**
Conveyor Technology new	944.250 €
Conveyor Technology other	
Total Machines	**3.777.000 €**
Subtotal CT / MT	**4.721.250 €**
Total other costs	**1.416.525 €**
Planning, Final Drawing, Assembling, Documentation, Test Run, etc.	660.975 €
Electrical Installation	189.000 €
Steel Construction	283.275 €
Plattforms, Stairs, Walkways	283.275 €
Subtotal	**6.137.775 €**
Contingency	614.225 €
Total	**6.752.000 €**

ECS: ✓
ISS: -
Robot: -

Stage 2

Description	Total
Total Conveyor Technology	**1.059.500 €**
Conveyor Technology new	1.059.500 €
Conveyor Technology other	
Total Machines	**4.238.000 €**
Subtotal CT / MT	**5.297.500 €**
Total other costs	**1.615.850 €**
Planning, Final Drawing, Assembling, Documentation, Test Run, etc.	741.650 €
Electrical Installation	238.500 €
Steel Construction	317.850 €
Plattforms, Stairs, Walkways	317.850 €
Subtotal	**6.913.350 €**
Contingency	691.650 €
Total	**7.605.000 €**

ECS: ✓
ISS: ✓
Robot: -

Stage 3

Description	Total
Total Conveyor Technology	**1.114.250 €**
Conveyor Technology new	1.114.250 €
Conveyor Technology other	
Total Machines	**4.457.000 €**
Subtotal CT / MT	**5.571.250 €**
Total other costs	**1.673.525 €**
Planning, Final Drawing, Assembling, Documentation, Test Run, etc.	779.975 €
Electrical Installation	225.000 €
Steel Construction	334.275 €
Plattforms, Stairs, Walkways	334.275 €
Subtotal	**7.244.775 €**
Contingency	724.225 €
Total	**7.969.000 €**

ECS: ✓
ISS: -
Robot: ✓

In the case of **Stage 0** (only one ECS in the medium size fraction) the total cost is about 6.594.000€ (~ -3%)

OPEX calculation – various scenarios (I)

Sorting plant sizes of 120kt for MSW and 60kt for PMD, revenues are indicative!

MSW	**120.000 t/a**	**Aluminium**	**0,81%**	(average content)				
PMD	**60.000 t/a**	**Aluminium**	**5,50%**	(average content)				
MSW				additional mass	revenue, spec.	revenue abs.	Invest	paid off
stage 0		53%	515 t/a	0	300 €	0 €		
stage 1		82%	797 t/a	282 t/a	300 €	84.564 €	158.000 €	1,9 a
stage 2		92%	894 t/a	379 t/a	300 €	113.724 €	1.011.000 €	8,9 a
stage 3		91%	886 t/a	371 t/a	300 €	111.391 €	1.375.000 €	12,4 a
PMD				additional mass	revenue, spec.	revenue abs.	Invest	paid off
stage 0		59%	1.954 t/a	0	300 €	0 €		
stage 1		90%	2.967 t/a	1.013 t/a	300 €	303.930 €	158.000 €	0,6 a
stage 2		94%	3.112 t/a	1.158 t/a	300 €	347.490 €	1.011.000 €	3 a
stage 3		96%	3.171 t/a	1.218 t/a	300 €	365.310 €	1.375.000 €	3,8 a

OPEX calculation – various scenarios (II)

Sorting plant sizes of 200kt for MSW and 80Kt for PMD, revenues are indicative!

MSW	**200.000 t/a**	**Aluminium**	**0,81%**	(average content)				
PMD	**80.000 t/a**	**Aluminium**	**5,50%**	(average content)				
MSW				additional mass	revenue, spec.	revenue abs.	Invest	paid off
stage 0		53%	859 t/a	0	350 €	0 €		
stage 1		82%	1.328 t/a	470 t/a	350 €	164.430 €	158.000 €	1 a
stage 2		92%	1.490 t/a	632 t/a	350 €	221.130 €	1.011.000 €	4,6 a
stage 3		91%	1.477 t/a	619 t/a	350 €	216.594 €	1.375.000 €	6,4 a
PMD				additional mass	revenue, spec.	revenue abs.	Invest	paid off
stage 0		59%	2.605 t/a	0	450 €	0 €		
stage 1		90%	3.956 t/a	1.351 t/a	450 €	607.860 €	158.000 €	0,3 a
stage 2		94%	4.149 t/a	1.544 t/a	450 €	694.980 €	1.011.000 €	1,5 a
stage 3		96%	4.228 t/a	1.624 t/a	450 €	730.620 €	1.375.000 €	1,9 a

Extended study for small sorting centres

Following the general study of an aluminium sorting model, European Aluminium asked for an extension with a focus on smaller sorting centres (examples: Spain, Austria).

The model specifications for this additional study are:

- Plant capacity about 20 kt annually (up to 40 kt for MSW)
- Scenario calculation of an optional deposit return system for aluminium cans

The model enables again the calculation of the recycling rates based on certain assumptions like technical inventories, capacities etc. and with respect to the same four aluminium packaging groups:

(i) Beverage cans
(ii) Aerosols, food cans and menu trays
(iii) Tubes, closures and capsules
(iv) Foils

Furthermore, the aim is to develop a cost model which structures and identifies total and incremental cost when applying certain technical measures.

Cost comparison – in general

	ECS fine	ECS medium	ISS fine	ISS medium	robot sorting medium or lights	cost increase factor
regular sorting plant	✗	✓	✗	✗	✗	100%
extension stage 1	✓	✓	✗	✗	✗	103%
extension stage 2	✓	✓	✓	✓	✗	108%
extension stage 3	✓	✓	✗	✗	✓	113%

The figure shows a percentage comparison of the calculated extension stages for aluminium recovery.

- Regular sorting plant: includes standard aluminium recovery with ECS in the medium fraction
- Extension stage 1: includes additional aluminium separation in fine fraction with ECS
- Extension stage 2: stage 1 + ISS for the separation of aluminium
- Extension stage 3: stage 1 + robot sorting for the separation of aluminium
- The last column shows the increase of costs in percentage in relation to the regular sorting plant

Cost comparison – detailed, CAPEX

Regular Sorting Plant

Description	Total
Total Conveyor Technology	**587.750 €**
Conveyor Technology new	587.750 €
Conveyor Technology other	
Total Machines	**2.351.000 €**
Subtotal CT / MT	**2.938.750 €**
Total other costs	**1.016.075 €**
Planning, Final Drawing, Assembling, Documentation, Test Run, etc.	411.425 €
Electrical Installation	252.000 €
Steel Construction	176.325 €
Plattforms, Stairs, Walkways	176.325 €
Subtotal	**3.954.825 €**
Contingency	395.175 €
Total	**4.350.000 €**

ECS: 1x, medium
ISS: -
Robot: -

Extension stage 1

Description	Total
Total Conveyor Technology	**609.000 €**
Conveyor Technology new	609.000 €
Conveyor Technology other	
Total Machines	**2.436.000 €**
Subtotal CT / MT	**3.045.000 €**
Total other costs	**1.043.700 €**
Planning, Final Drawing, Assembling, Documentation, Test Run, etc.	426.300 €
Electrical Installation	252.000 €
Steel Construction	182.700 €
Plattforms, Stairs, Walkways	182.700 €
Subtotal	**4.088.700 €**
Contingency	409.300 €
Total	**4.498.000 €**

ECS: 1x fine, 1x medium
ISS: -
Robot: -

Extension stage 2

Description	Total
Total Conveyor Technology	**639.125 €**
Conveyor Technology new	639.125 €
Conveyor Technology other	
Total Machines	**2.556.500 €**
Subtotal CT / MT	**3.195.625 €**
Total other costs	**1.082.863 €**
Planning, Final Drawing, Assembling, Documentation, Test Run, etc.	447.388 €
Electrical Installation	252.000 €
Steel Construction	191.738 €
Plattforms, Stairs, Walkways	191.738 €
Subtotal	**4.278.488 €**
Contingency	427.512 €
Total	**4.706.000 €**

ECS: 1x fine, 1x medium
ISS: yes (1x)
Robot: -

Extension stage 3

Description	Total
Total Conveyor Technology	**671.500 €**
Conveyor Technology new	671.500 €
Conveyor Technology other	
Total Machines	**2.686.000 €**
Subtotal CT / MT	**3.357.500 €**
Total other costs	**1.124.950 €**
Planning, Final Drawing, Assembling, Documentation, Test Run, etc.	470.050 €
Electrical Installation	252.000 €
Steel Construction	201.450 €
Plattforms, Stairs, Walkways	201.450 €
Subtotal	**4.482.450 €**
Contingency	448.550 €
Total	**4.931.000 €**

ECS: 1x fine, 1x medium
ISS: -
Robot: yes (1x)

NB: The investment costs of the extension stages are indicative, to be calculated for each sorting centre individually

Cost comparison – detailed, OPEX

calculation without deposit system								
MSW	**40000 t/a**	**Aluminium**	**0,81%** (average content)					
PMD	**20000 t/a**	**Aluminium**	**5,40%** (average content)					
MSW				additional mass	revenue, spec.	revenue abs.	Invest	paid off
stage 0	Base	58%	188 t/a	0	300 €	- €		
stage 1	ECS	82%	266 t/a	78 t/a	300 €	23.328 €	148.000 €	6,3 a
stage 2	ECS+ISS	93%	301 t/a	113 t/a	300 €	34.020 €	356.000 €	10,5 a
stage 3	ECS+Robot	91%	295 t/a	107 t/a	300 €	32.076 €	581.000 €	18,1 a
PMD				additional mass	revenue, spec.	revenue abs.	Invest	paid off
stage 0	Base	71%	767 t/a	0	300 €	- €		
stage 1	ECS	85%	918 t/a	151 t/a	300 €	45.360 €	148.000 €	3,3 a
stage 2	ECS+ISS	96%	1037 t/a	270 t/a	300 €	81.000 €	356.000 €	4,4 a
stage 3	ECS+Robot	86%	929 t/a	162 t/a	300 €	48.600 €	581.000 €	12,0 a
calculation with deposit system								
MSW	**40000 t/a**	**Aluminium**	**0,30%** (average content)					
PMD	**20000 t/a**	**Aluminium**	**1,90%** (average content)					
MSW				additional mass	revenue, spec.	revenue abs.	Invest	paid off
stage 0	Base	44%	53 t/a	0	200 €	- €		
stage 1	ECS	77%	92 t/a	40 t/a	200 €	7.920 €	148.000 €	18,7 a
stage 2	ECS+ISS	90%	108 t/a	55 t/a	200 €	11.040 €	356.000 €	32,2 a
stage 3	ECS+Robot	88%	106 t/a	53 t/a	200 €	10.560 €	581.000 €	55,0 a
PMD				additional mass	revenue, spec.	revenue abs.	Invest	paid off
stage 0	Base	53%	201 t/a	0	200 €	- €		
stage 1	ECS	79%	300 t/a	99 t/a	200 €	19.760 €	148.000 €	7,5 a
stage 2	ECS+ISS	94%	357 t/a	156 t/a	200 €	31.160 €	356.000 €	11,4 a
stage 3	ECS+Robot	81%	308 t/a	106 t/a	200 €	21.280 €	581.000 €	27,3 a

OPEX calculation for smaller MSW and LWP sorting centres

- Scenarios without and with DRS in place;
- Revenues based on an assumed scrap price of € 300 respectively € 200 per tonne.

Conclusions:

- Stage 1 and 2 in particular feasible for PMD plants within a non-DRS scenario (3 – 4 years ROI)
- Stage 1 still possible in a DRS scenario (7 years ROI)

ALUMINIO Y ACERO BOLSA NEGRA SOGAMA

	Tn RECUPERADAS			VENTA DE MATERIALES		
	ALUMINIO	ACERO	TOTAL	ALUMINIO	ACERO	TOTAL
	(t)	(t)	(t)	(€)	(€)	(€)
enero-17	17	365	382	9.661 €	40.144 €	49.805
febrero-17	19	414	433	10.773 €	45.572 €	56.345
marzo-17	31	595	626	17.695 €	65.429 €	83.124
abril-17	23	584	607	13.203 €	64.243 €	77.445
mayo-17	33	786	819	18.830 €	86.502 €	105.332
junio-17	15	580	595	8.699 €	62.634 €	71.333
julio-17	14	443	458	9.349 €	47.870 €	57.219
agosto-17	21	632	653	13.424 €	68.286 €	81.710
septiembre-17	19	322	341	12.226 €	34.787 €	47.013
octubre-17	7	493	499	4.245 €	53.232 €	57.477
noviembre-17	17	533	550	10.898 €	57.594 €	68.492
diciembre-17	7	382	389	4.700 €	58.087 €	62.787
enero-18	14	665	679	9.276 €	101.136 €	110.411
febrero-18	8	533	541	5.712 €	81.021 €	86.733
marzo-18	9	528	537	6.215 €	80.306 €	86.522
abril-18	10	797	807	6.814 €	121.169 €	127.983
mayo-18	6	232	238	4.053 €	35.241 €	39.294
junio-18	61	211	272	41.237 €	34.436 €	75.673
julio-18	126	585	711	89.070 €	95.445 €	184.515
agosto-18	159	853	1.012	112.718 €	139.001 €	251.719
septiembre-18	155	634	789	113.018 €	103.381 €	216.399
octubre-18	111	425	536	78.421 €	69.244 €	147.666
noviembre-18	94	582	675	67.931 €	89.639 €	157.570
diciembre-18	81	424	505	58.870 €	63.830 €	122.700
enero-19	156	393	550	117.572 €	55.982 €	173.554
febrero-19	132	543	675	105.527 €	66.962 €	172.489
marzo-19	129	836	966	103.667 €	103.389 €	207.056
Total	1.250	8.242	9.492	920.103	1.240.182	2.160.285

Instalacion nuevos recuperadores de aluminio

Operación nueva planta

Example: residual waste from Galicia, Spain (2,2 million people): MSW sorting plant of 700kt annual capacity upgraded with extra ECS – extra aluminium sorted

January 2017 to May 2018:

16 tons/month (average)

New ECS on old line

June to December 2018: + 625 %

116 tons/month (average)

2nd ECS on new line

January to March 2019: + 20%

139 tons/month (average)

(and the amount of steel went up from 530 to 591 kg / month (average)

Invest more into our European Circular Economy, it really pays off!

/ Questions? Contact us!

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