



ΕΝΕΡΓΕΙΑΚΗ ΑΞΙΟΠΟΙΗΣΗ ΑΠΟΒΛΗΤΩΝ ΣΤΟ ΠΛΑΙΣΙΟ ΜΙΑΣ ΟΛΟΚΛΗΡΩΜΕΝΗΣ ΑΕΙΦΟΡΟΥ ΔΙΑΧΕΙΡΙΣΗΣ

Αίθουσα τελετών Πρυτανεία ΕΜΠ, Παρασκευή 15.01.2016, 09:00 πμ



Παραγωγή καυσίμου από ΑΣΑ για ενεργειακή αξιοποίηση σε σταθμό τηλεθέρμανσης και στην τσιμεντοβιομηχανία - Η περίπτωση της μονάδας MBT του Δήμου Σόφιας

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ΗΛΕΚΤΩΡ ΑΕ



**DESIGN AND CONSTRUCTION OF SOFIA MBT PLANT FOR
PROCESSING WASTE AND PRODUCTION OF REFUSE DERIVED FUEL**
SOFIA MUNICIPALITY / CONSORTIUM AKTOR S.A. – HELECTOR S.A.



OPERATIONAL PROGRAMME
ENVIRONMENT 2007 – 2013



Utilizing waste

- MSW handling capacity: 600.000t/a in Greece, Cyprus and Germany
- Landfill site operation 200.000 t/a
- Renewable electricity production: 200.000 MWh/a
- CO2 saving: 176.000 t/a
- Recyclable recovery: 45.000 t/a
- Secondary fuel (SRF/RDF) production: 200.000 t/a



Power production from landfill gas

BEAL – Ano Liosia, Atrtica



- Helector – EDL (Australia) joint venture
- Largest landfill gas power plant in Europe
- Installed power: 23,5 MW
- In operation from 2001
- Planed power increase 2,35MW
- el production: 170.000MWel/a
- CO2 saving: 145.000t/a

Tagarades, Thessaloniki

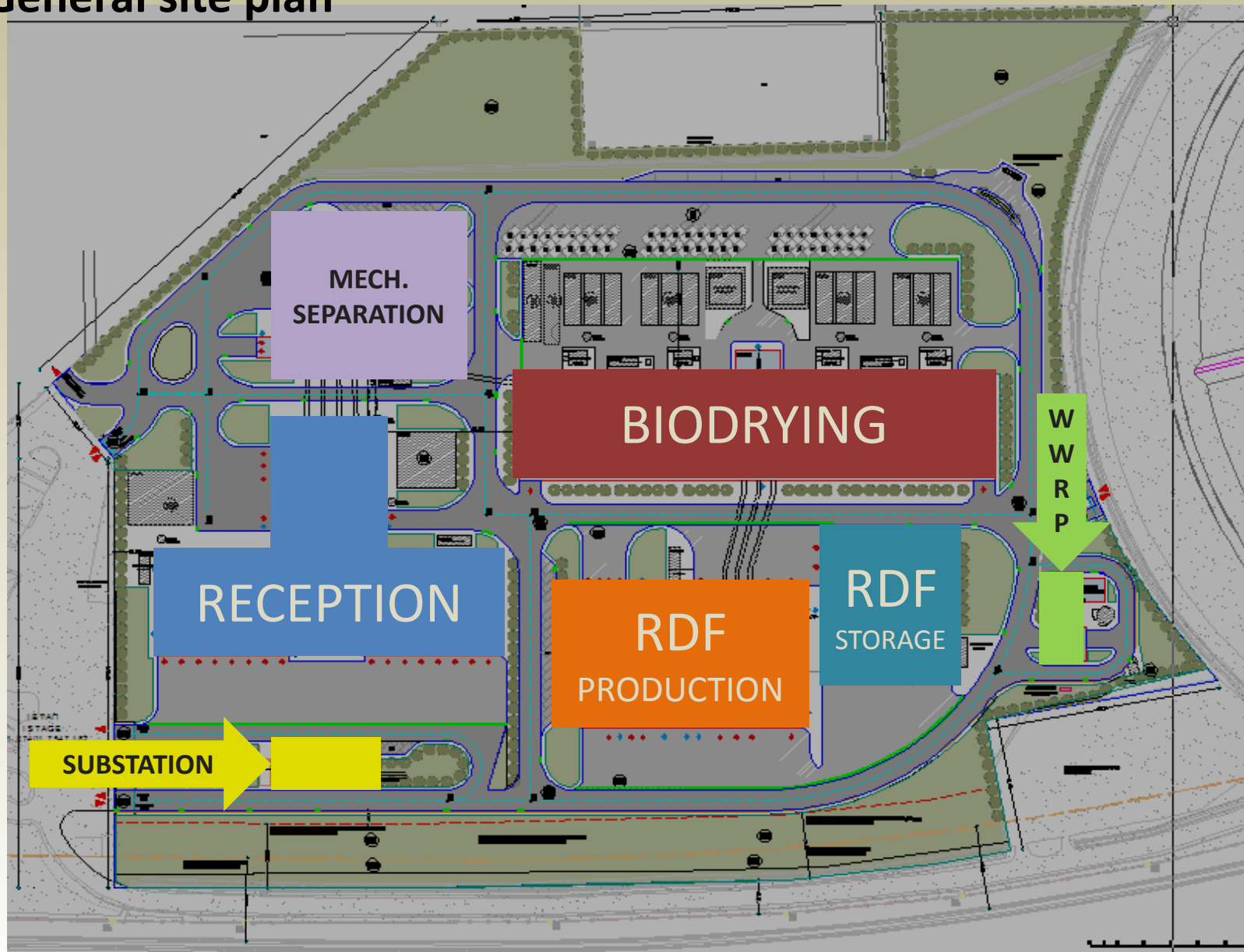


- Design, construction, operation
- Installed power: 5 MW
- In operation from 2007
- el production: 30.000MWel/a
- CO2 saving: 24.000t/a

Project Outline

Project	Design and construction of Sofia MBT plant for processing waste and production of refuse derived fuel
Employer	Sofia Municipality
Contractor	Consortium Aktor SA – Helector SA
Location	22 km east from Sofia (area Yana Village, Sadinata)
Population	1,2 mil (2012)
Input waste	Municipal Solid Waste (MSW) 20 03 01
Capacity	410.000 t/y
Output (end use)	Recyclables (re-use), RDF (municipal district heating, cement plants, WtE), CLO (landscaping)
Duration	19 months (12.2013 – 09.2015)
Operation	12 months (10.2015 – 09.2016)
Tender goals	Maximum RDF production Recyclables recovery, CLO production Minimum residue

General site plan



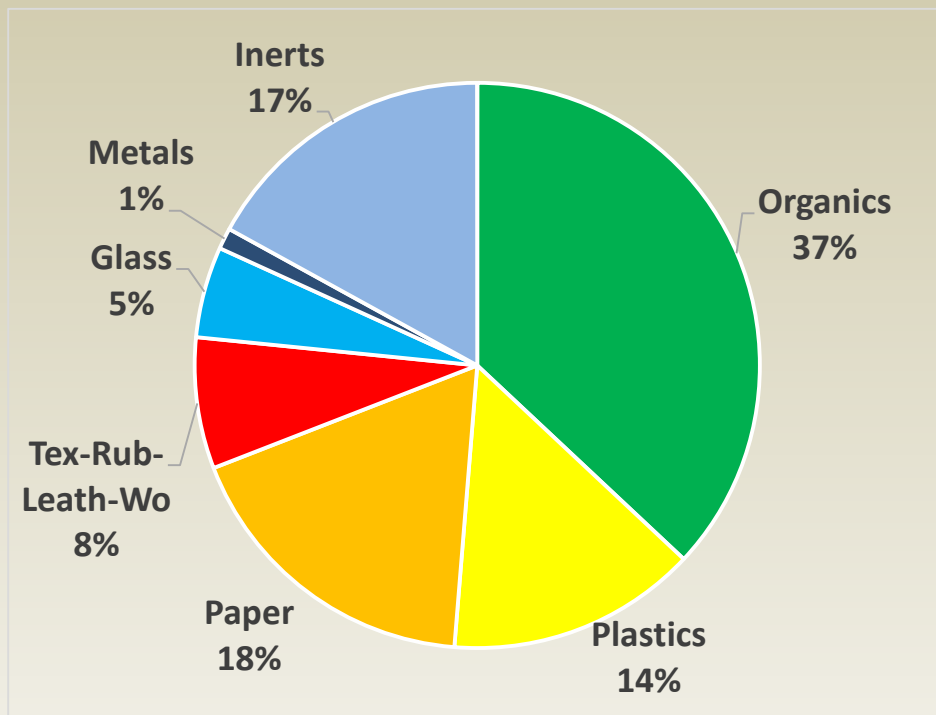
MBT plant (3D view)



MBT Plant

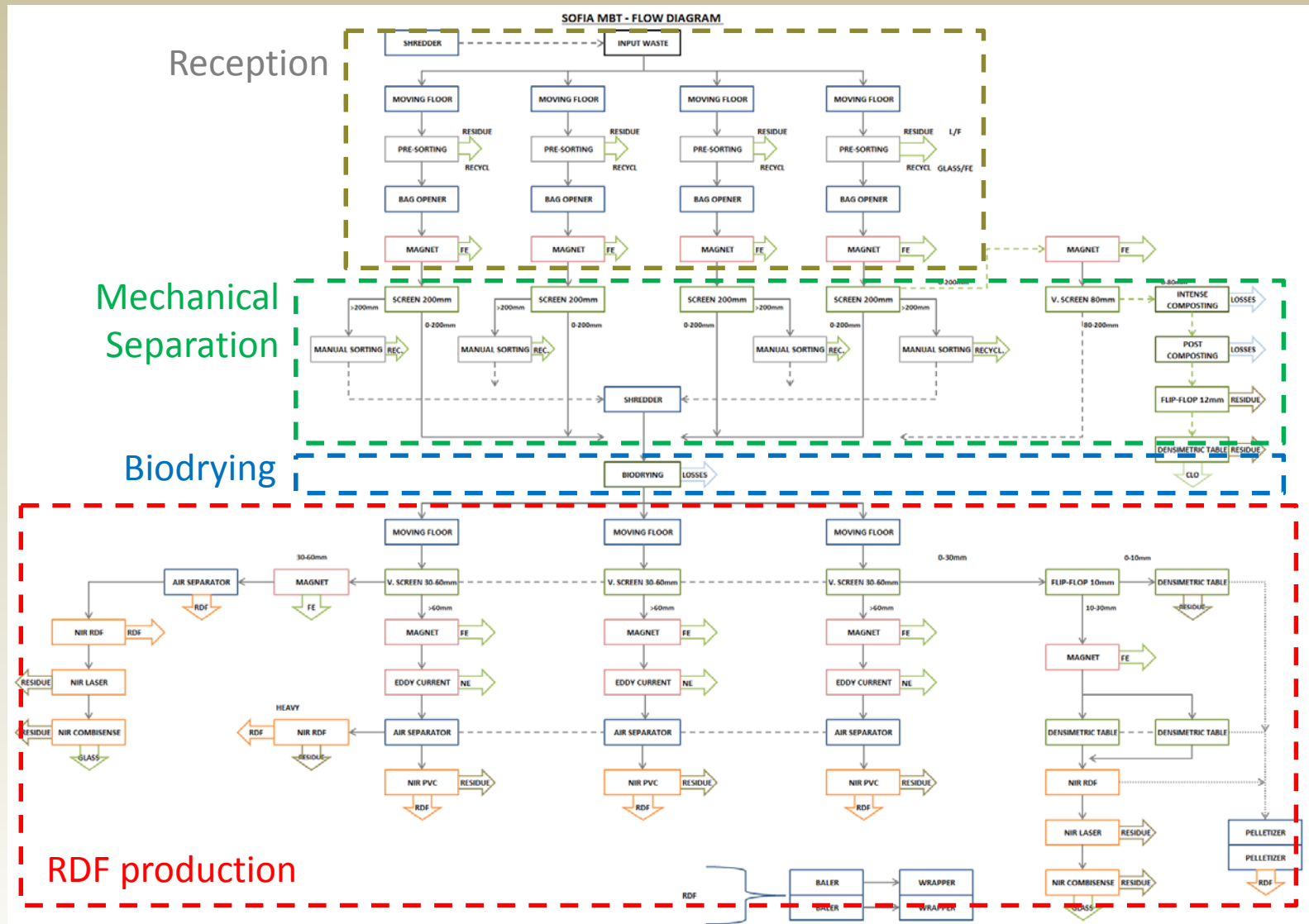


Input waste composition

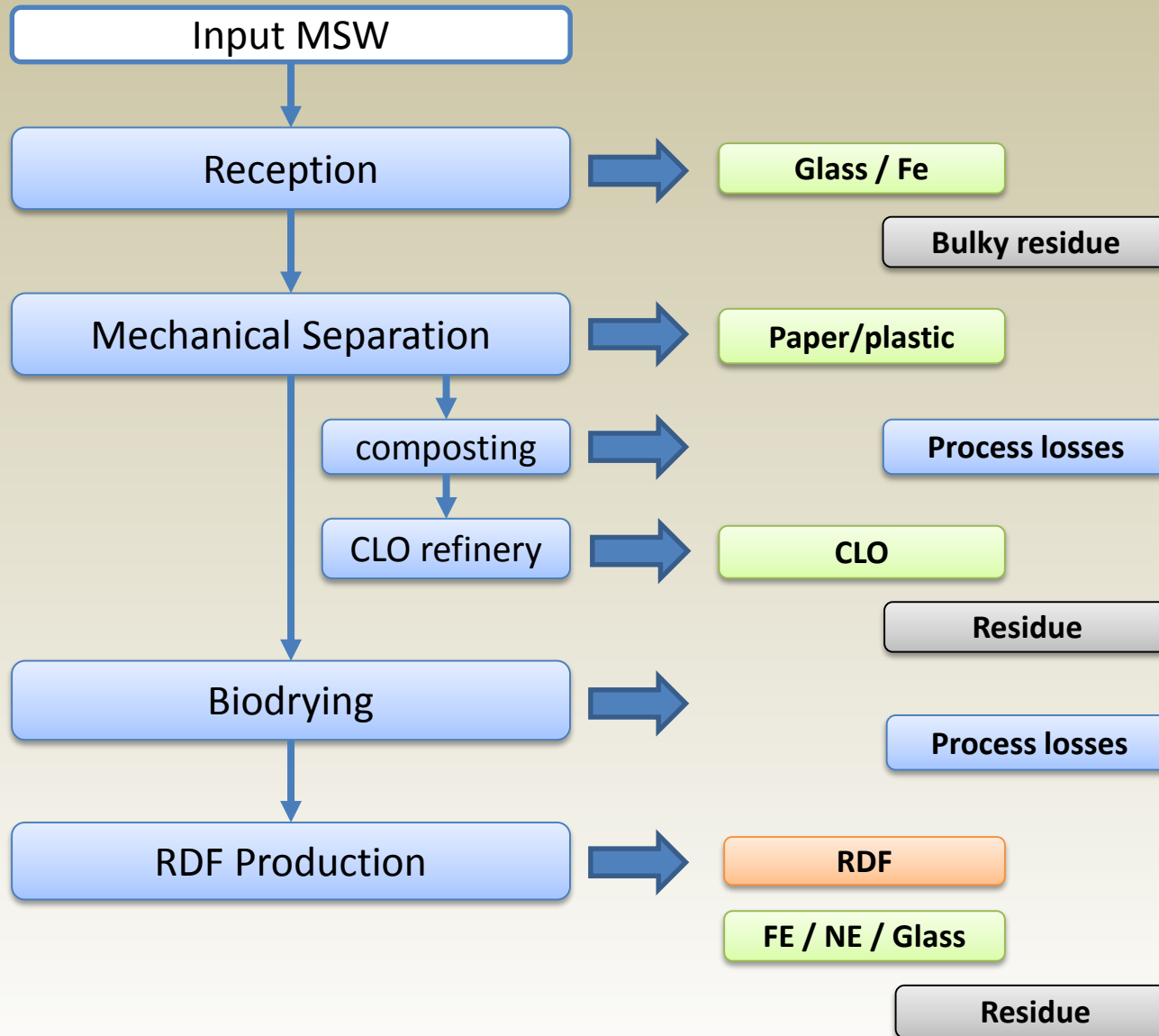


Fraction	Mass (t/a)	%
Food waste	141.450	34,50%
Garden green waste	10.250	2,50%
Plastics	58.630	14,30%
Paper	39.360	9,60%
Cardboard	33.620	8,20%
Textile	16.400	4,00%
Rubber	2.870	0,70%
Leather	3.690	0,90%
Wood	7.790	1,90%
Glass	21.320	5,20%
Metals	4.920	1,20%
Inert	67.650	16,50%
Hazardous waste	2.050	0,50%
Total	410.000	100%

Detailed process flow diagram

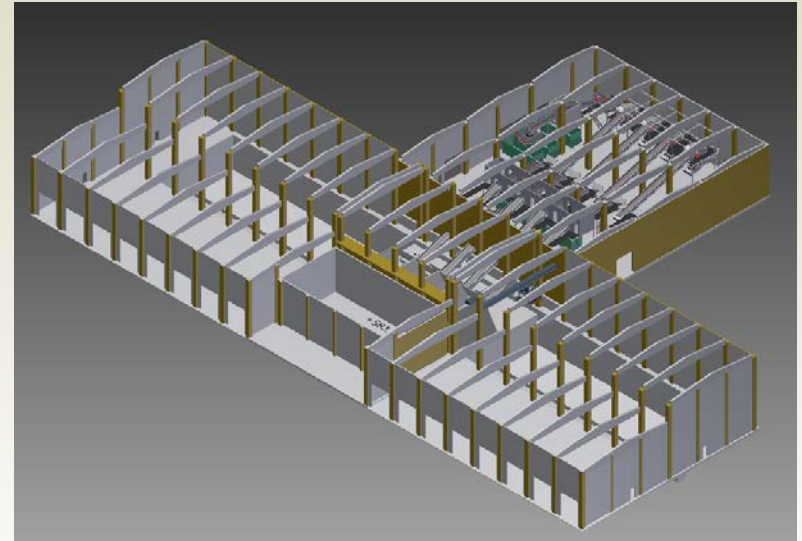
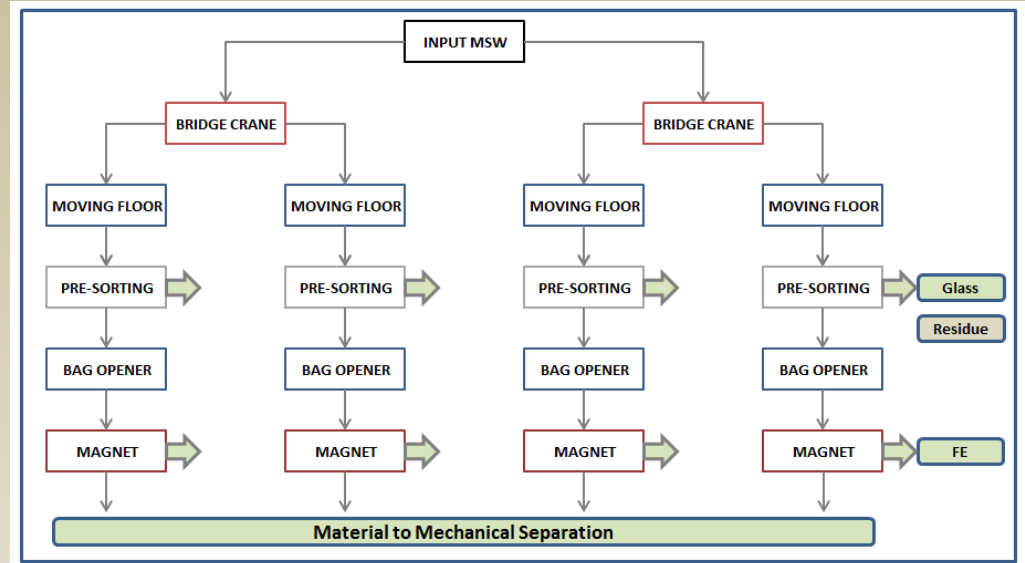


Conceptual process flow diagram



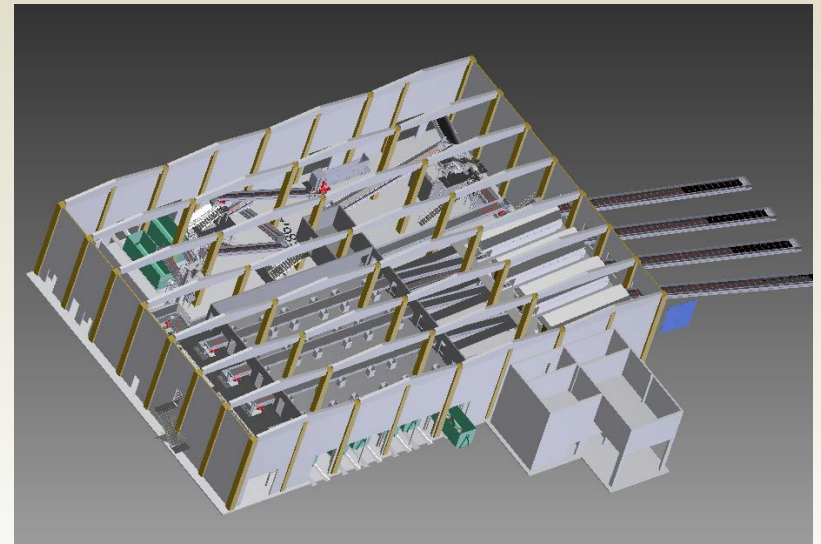
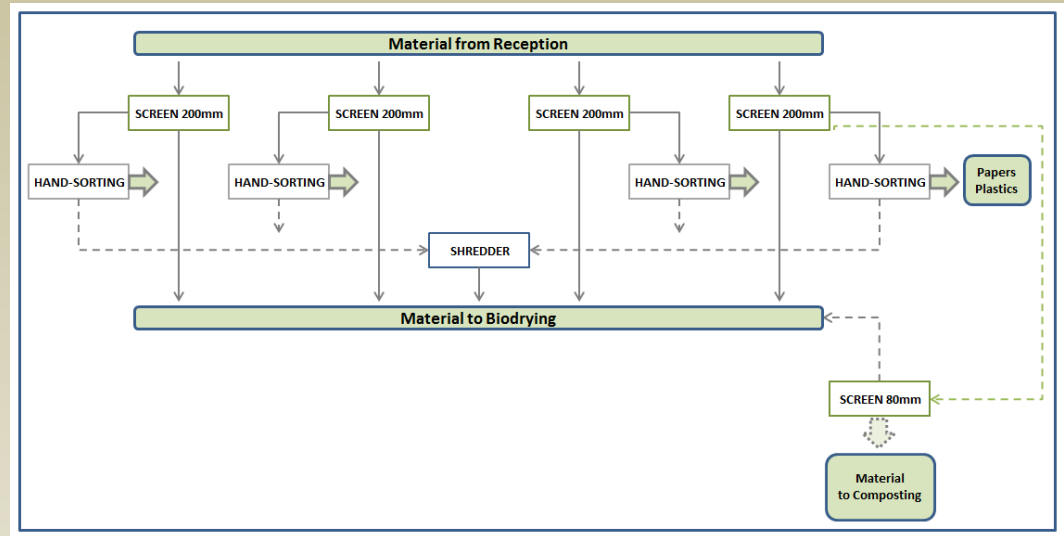
Reception building

- 16 waste truck unloading positions
- 2 deep bunkers
- 4 process lines
- Glass / FE recovery
- Material preparation for Mechanical Separation



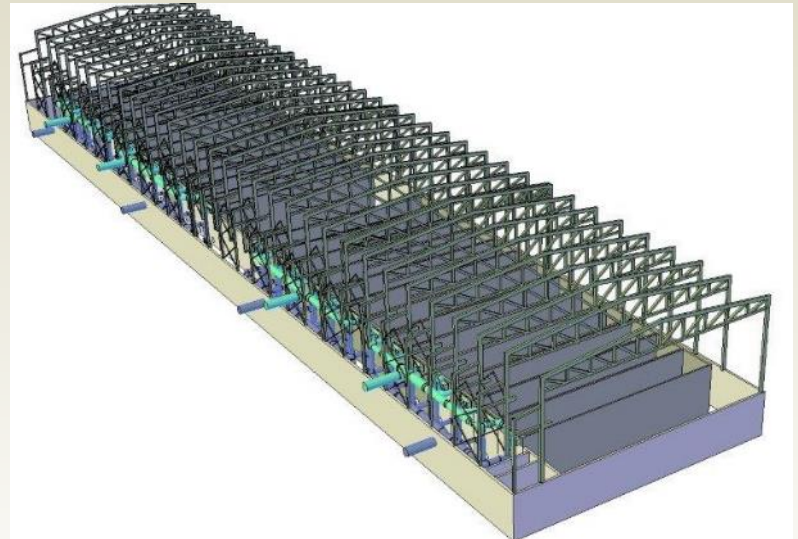
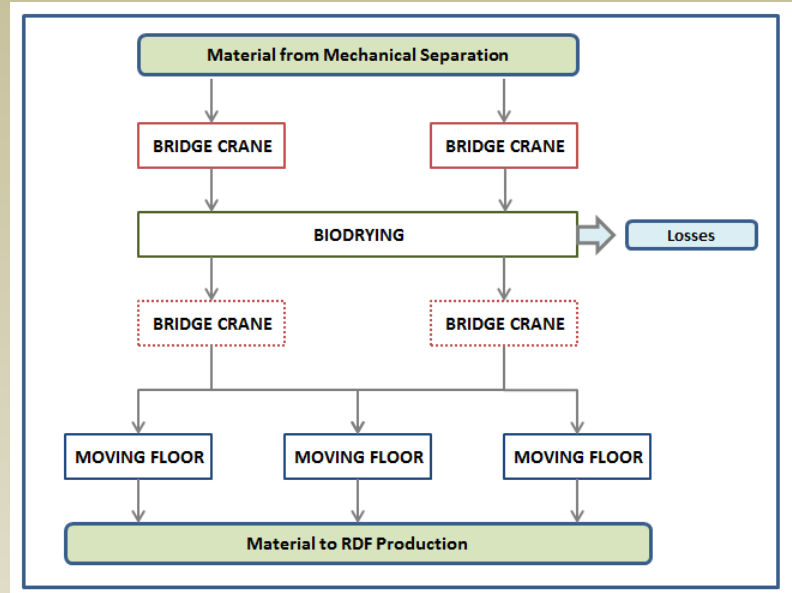
Mechanical Separation building

- Material preparation for biodrying
- Material preparation for composting
- Plastic / paper recovery

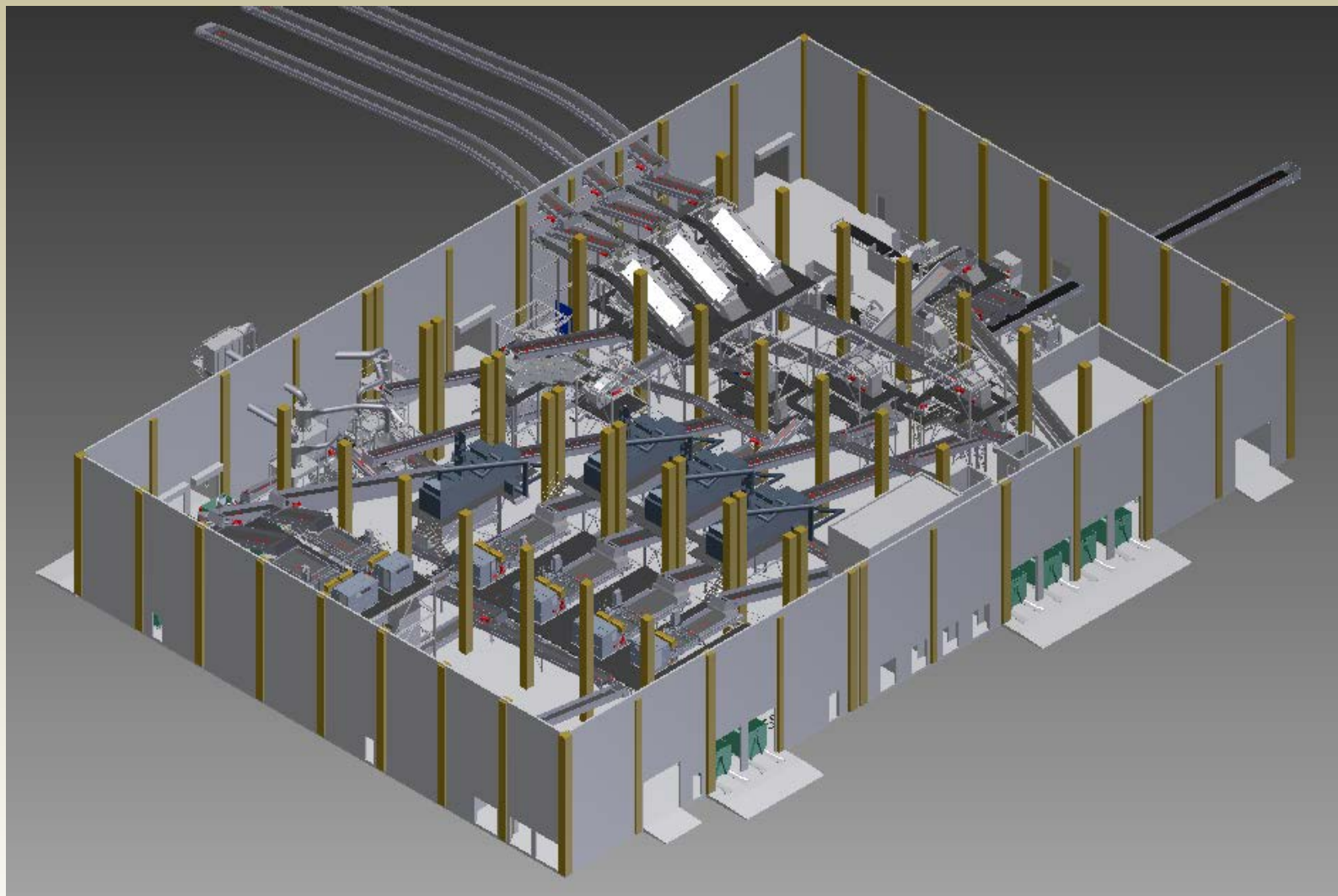


Biodrying building

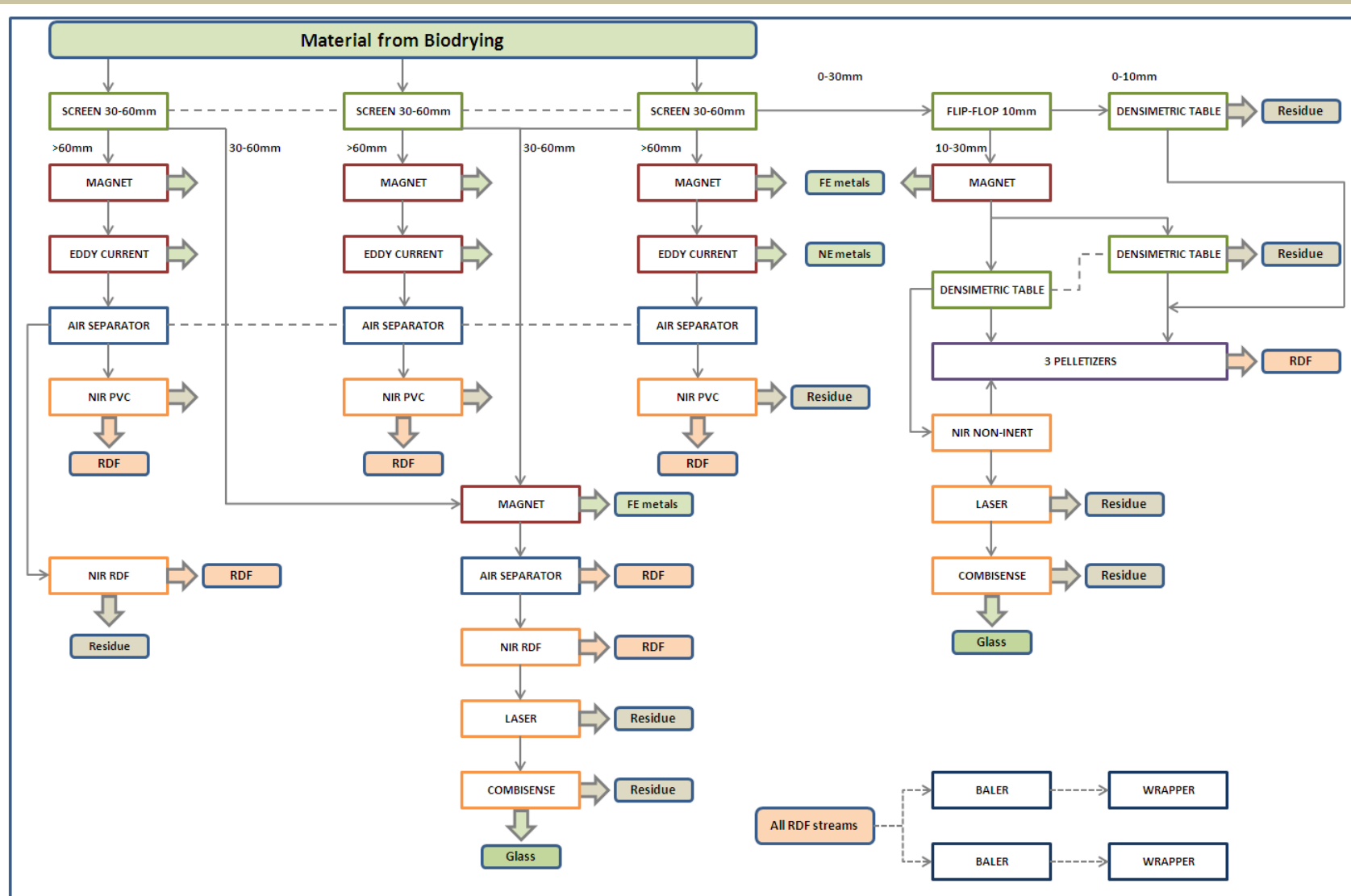
- 26 Bioreactors
- Automatic bioreactors' loading and unloading by 2 bridge cranes
- 3 process lines transfer bio-dried material to the RDF Production building



RDF production building and equipment (3D view)



RDF production process flow chart



Optimized RDF production process

Upgraded quality

- Exhaustive combustible material recovery
- Organics removal out of residual fraction
- PVC extraction by optical separators



Optimized overall process

Size control

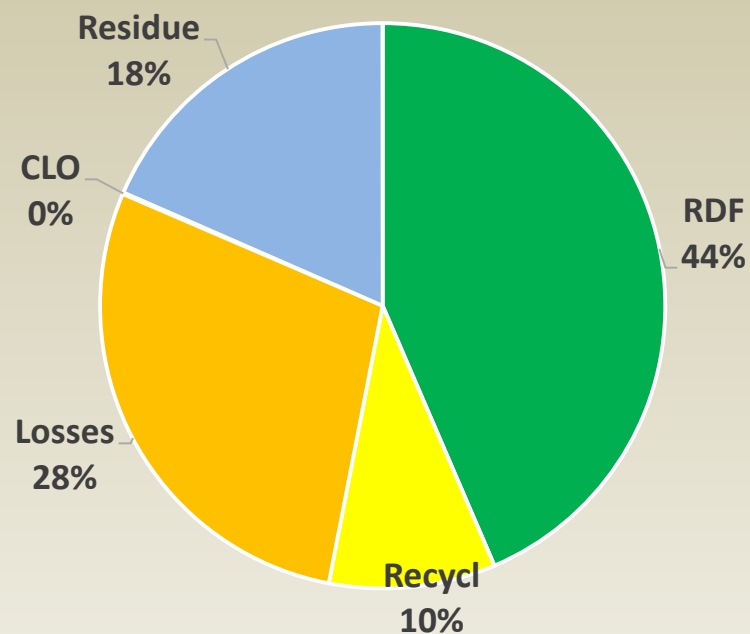
RDF Baling

Bale Wrapping

Metals recovery

Glass recovery

Products



Products (code)	t/a
RDF (19 12 10)	180.000
Recyclable materials	40.000
• Paper and cardboard (10 12 01)	
• Plastic and rubber (19 12 04)	
• Ferrous metals (19 12 02)	
• Non-ferrous metals (19 12 03)	
• Glass (19 12 05)	
CLO (19 05 03)	500
Residue (19 12 12)	74.500
Process losses	115.000
Total	410.000

RDF Specifications

Parameter	value
Calorific Value	14 – 17 MJ/kg
Moisture Content	< 20% w/w
Particle size	30 -200mm
Ash	15 – 20 % w/w
Sulphur S	< 1,00% w/w
Chlorine Cl	< 0,75% w/w
Fluorine F	< 0,03% w/w
Mercury Hg	< 0,60 ppm
Cadmium Cd	< 4.0ppm
Thallium Th	< 1.0ppm
Antimony Sb	< 25ppm
Arsenic As	< 5ppm

Parameter	value
Chromium Cr	< 40ppm
Cobalt Co	< 6ppm
Copper Cu	< 100ppm
Lead Pb	< 70ppm
Manganese Mn	< 50ppm
Nickel Ni	< 25ppm
Tin Sn	< 30ppm
Vanadium V	< 10ppm
Zinc Zn	< 400ppm
P2O5	< 0.3%
PCBs	< 50ppm

RDF quality monitoring

- Sampling
- Sample preparation
- Physical and chemical properties measurement
- Delivered material with laboratory analysis certificate



Commercial features

- **Trading issues**
 - Fluff form
 - Soft pellets
 - Baled
 - Baled and wrapped
 - Lab analysis certificate
- **Cement industry**
 - Devnya Cement S.A. (Italcementy Group)
 - Zlatna Panega Cement S.A. (Titan Cement)
 - Holcim (Bulgaria) S.A.
- **Heat and power plants**
 - Sofia Municipality (CHP)
 - Maritsa Iztok TPP



Thank you for your attention!



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