

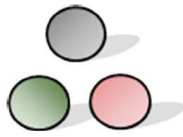


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Organic fraction from solid waste: The best approach to produce Energy

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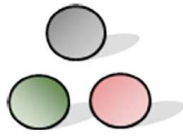


Different ways to produce Energy from OF-MSW (Organic Fraction-Municipal Solid Waste):

1. Anaerobic digestion from Organic fraction

2. Anaerobic co-digestion from Organic fraction

and sludge from municipal STP



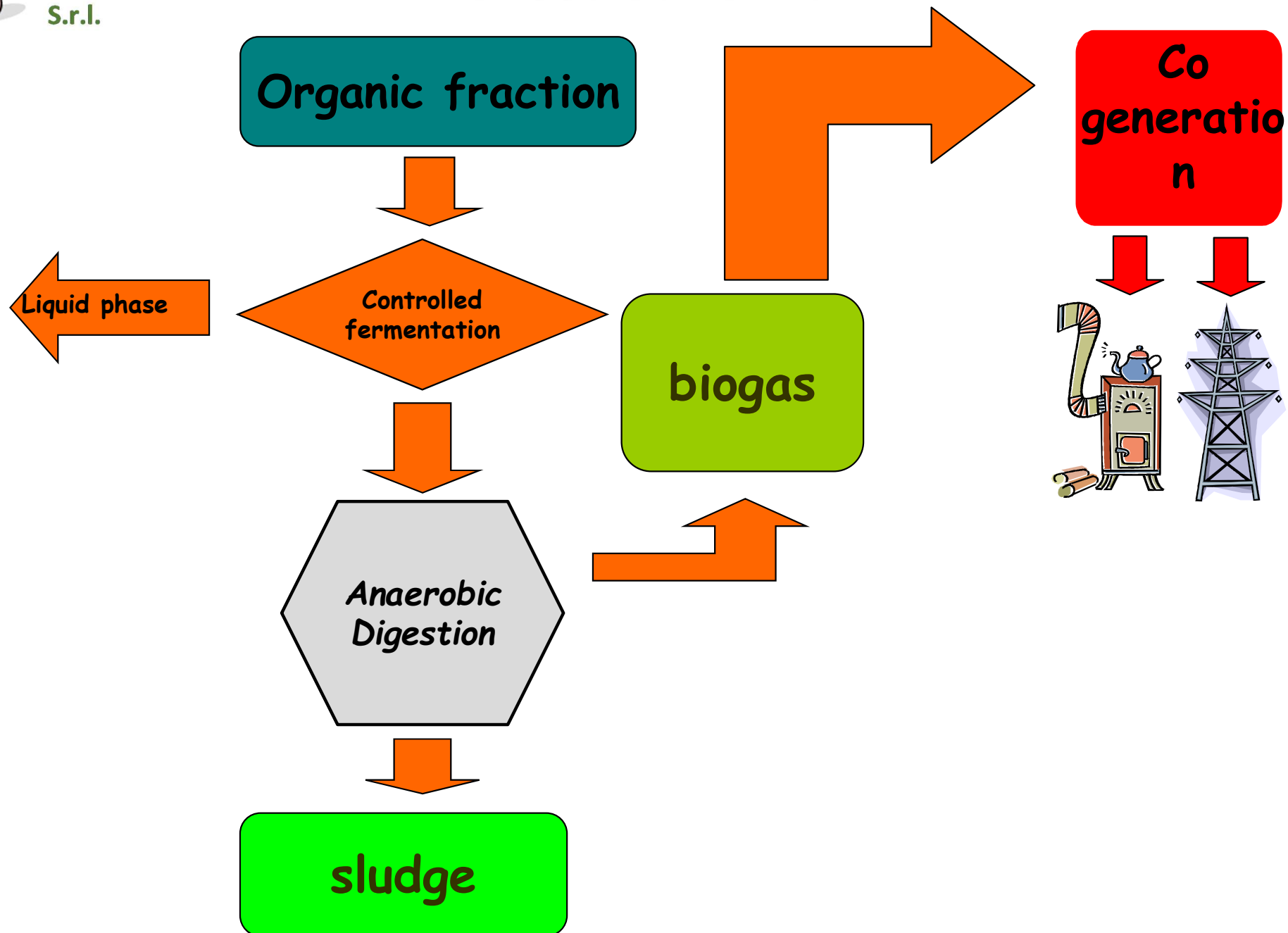
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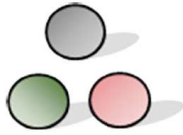
1 - Anaerobic digestion from Organic fraction



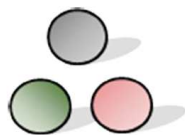


Process scheme



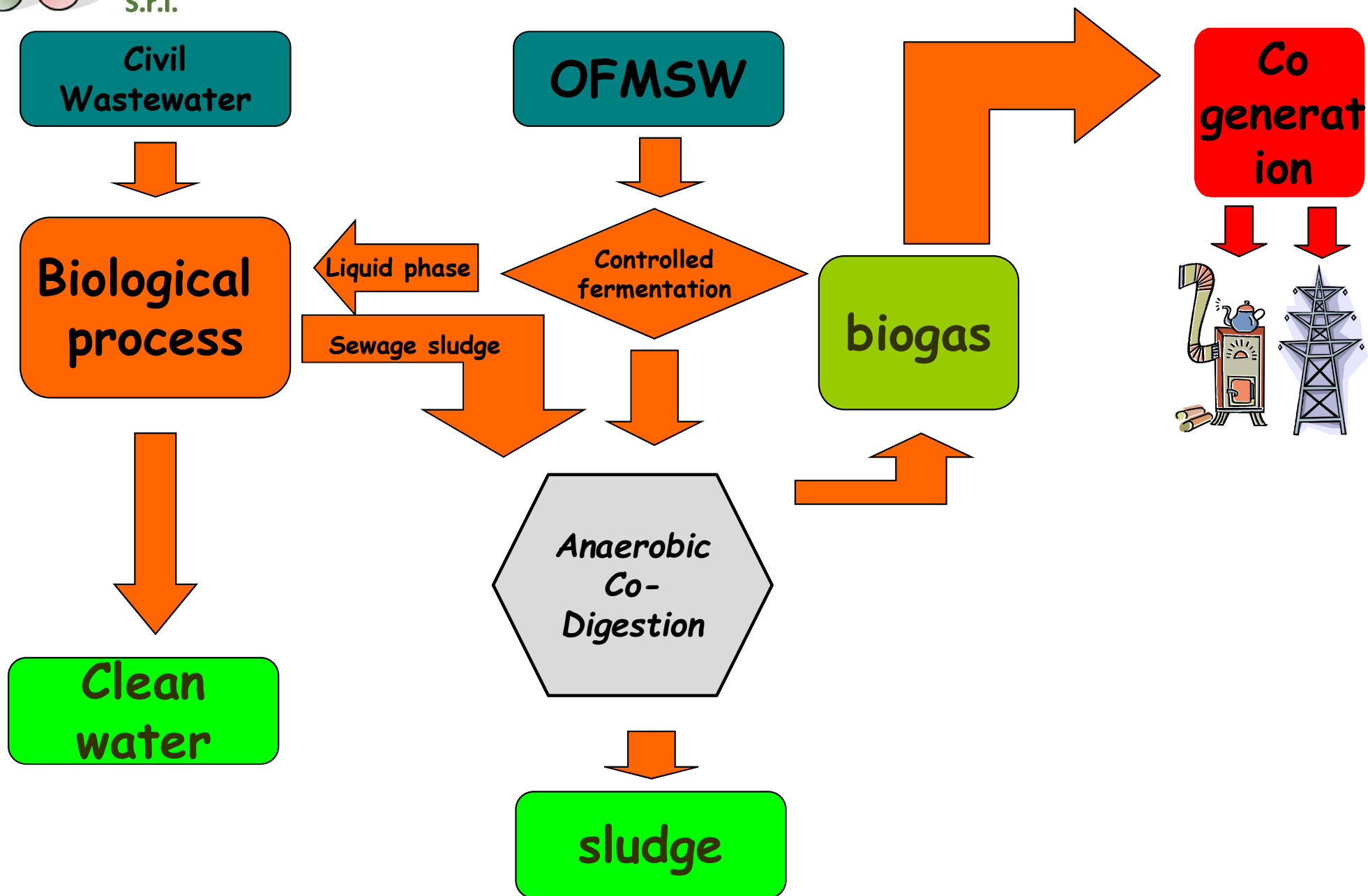


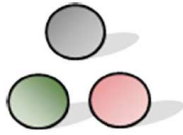
2. Anaerobic co-digestion from Organic fraction and WAS (waste activated sludge) from municipal STP



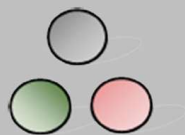
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Process scheme





***In both cases it is necessary to pre-treat the OF-
MSW before feeding the Anaerobic Digester***

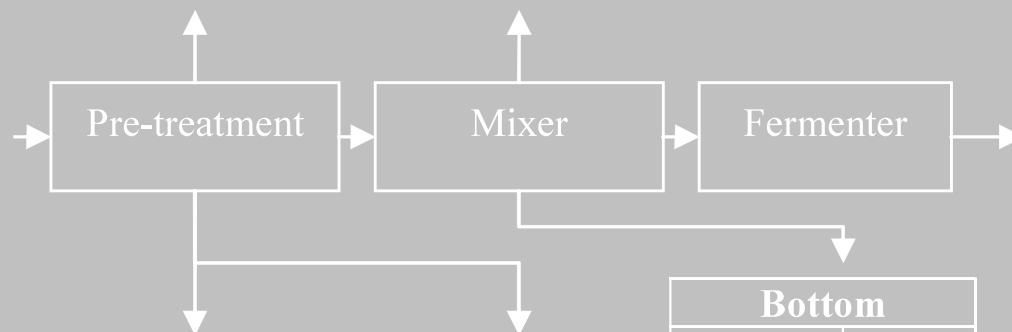


Mass balance of OF-MSW Pre-Treatment

OFMSW	
Organic	590.5
Plastic	145.8
Metals	22.0
Glass	25.4
Textiles	13.3
Wood	15.3
Paper	164.7
Inerts	23.0
Total	1000.0

Iron removal	
Organic	4.2
Plastic	5.6
Metals	11.8
Glass	0.1
Textiles	0.6
Wood	0.1
Paper	1.6
Inerts	0.5
Total	24.6

Floats	
Organic	38.4
Plastic	33.9
Metals	0.0
Glass	0.0
Textiles	1.8
Wood	10.2
Paper	0.5
Inerts	3.4
Total	88.2

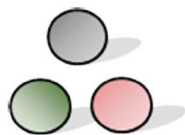


Screen	
Organic	45.4
Plastic	81.9
Metals	5.1
Glass	0.0
Textiles	7.0
Wood	2.6
Paper	12.9
Inerts	10.6
Total	165.6

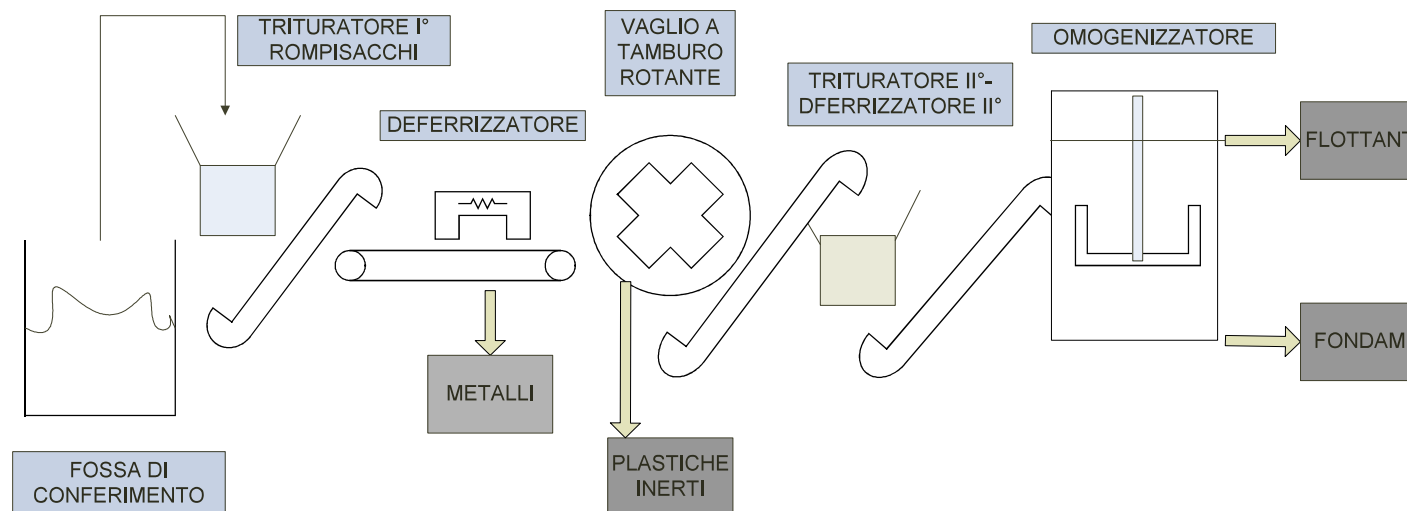
II° iron removal	
Organic	5.5
Plastic	0.4
Metals	2.6
Glass	0.2
Textiles	0.1
Wood	0.1
Paper	0.2
Inerts	0.3
Total	9.3

Bottom	
Organic	46.2
Plastic	14.5
Metals	2.4
Glass	24.7
Textiles	0.9
Wood	0.3
Paper	27.8
Inerts	0.4
Total	117.4

Outlet	
Organic	450.7
Plastic	9.5
Metals	0.0
Glass	0.4
Textiles	2.9
Wood	2.1
Paper	121.7
Inerts	7.7
Total	595.0



Process chain of OF-MSW Pre-treatment



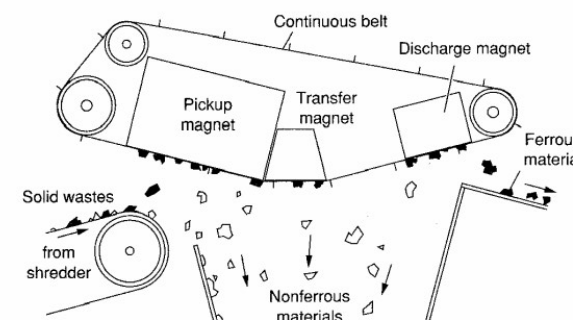
Fossa di conferimento



Rompisacchi



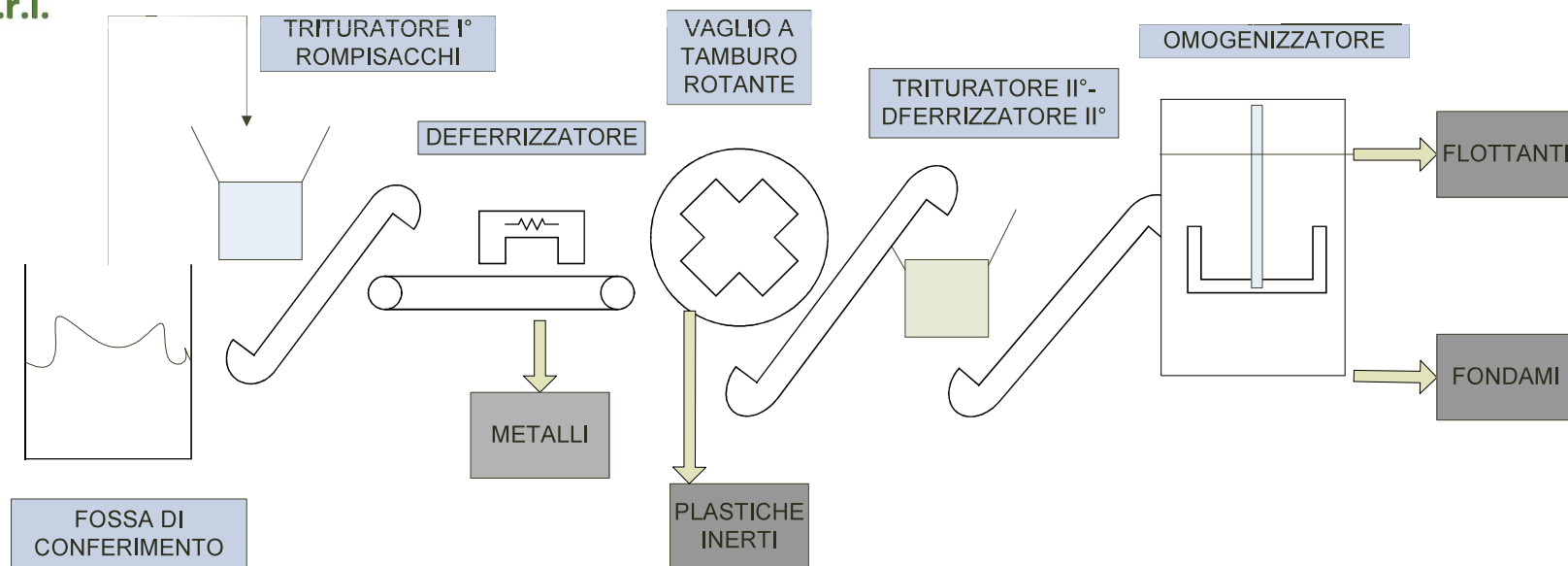
Separatore magnetico





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Process chain of OF-MSW Pre-treatment



Vaglio



Trituratore

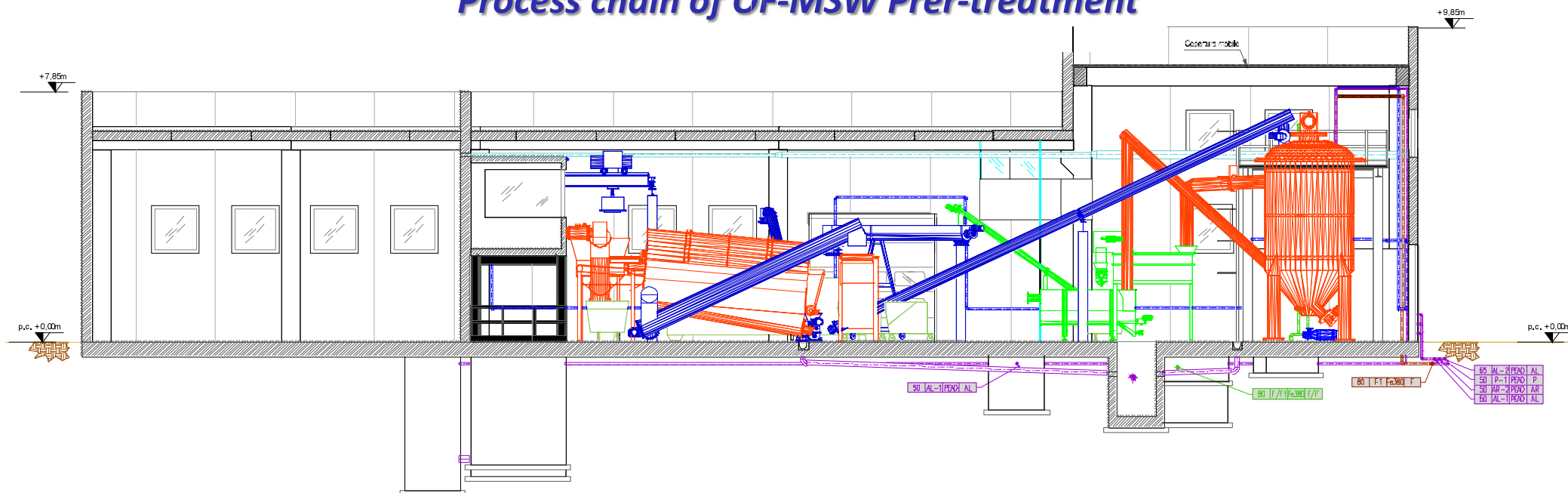


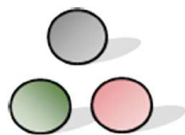
Miscelatore



Lavaggio scarti

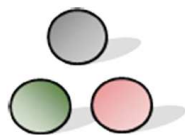






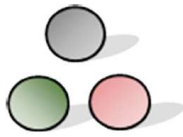
Anaerobic digestion – Functional parameters

<i>Paramter</i>	<i>U.m.</i>	<i>Value</i>
<i>Temperature in the reactor</i>	<i>°C</i>	<i>35 - Mesophylic</i>
<i>HRT - Hydraulic Retenton Time</i>	<i>days</i>	<i>28-32</i>
<i>OLR - Organic Load Rate</i>	<i>KgTVS/(m3d)</i>	<i>0.9-1.2</i>
<i>SGP - Standard Gas Production</i>	<i>m3/Kg TVS_{IN}</i>	<i>0.3-0.4</i>
<i>TS_{IN} - Total Solids</i>	<i>g/Kg</i>	<i>35-40</i>
<i>TVS_{IN} - Total volatile Solids</i>	<i>g/Kg</i>	<i>59-62</i>
<i>pH Influent</i>		<i>6.5-7.0</i>



What obtain with 1 ton of OF-MSW

<i>Paramter</i>	<i>U.m.</i>	<i>Value</i>
<i>Total Energy Production</i>	<i>kWh</i>	<i>300-360</i>
<i>Heat over the consupction in anaerobic digestion</i>	<i>Mcal</i>	<i>210-300</i>
<i>Sludge producted at 25%TS</i>	<i>kg</i>	<i>90-200</i>
<i>Supernatants producted</i>	<i>m3</i>	<i>1.7-3.0</i>
<i>Nitrogean back to waterl line to treat</i>	<i>PE</i>	<i>200-300</i>



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A full scale plant (Treviso WWTP): the sludge line



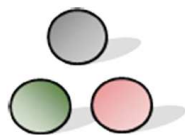
Anaerobic digester



Biogas stocking tank



Dewatering station



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A full scale plant (Treviso WWTP): the OF-MSW section



The waste as collected



The OFMSW treatment section



Co-generation unit (200 kWh)



Co-generation unit (200 kWh)



References

