

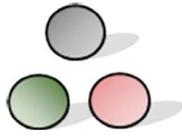
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# ***Organic fraction from solid waste: The best approach to produce Energy***

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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***

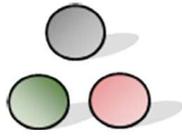
***and sludge from municipal STP***

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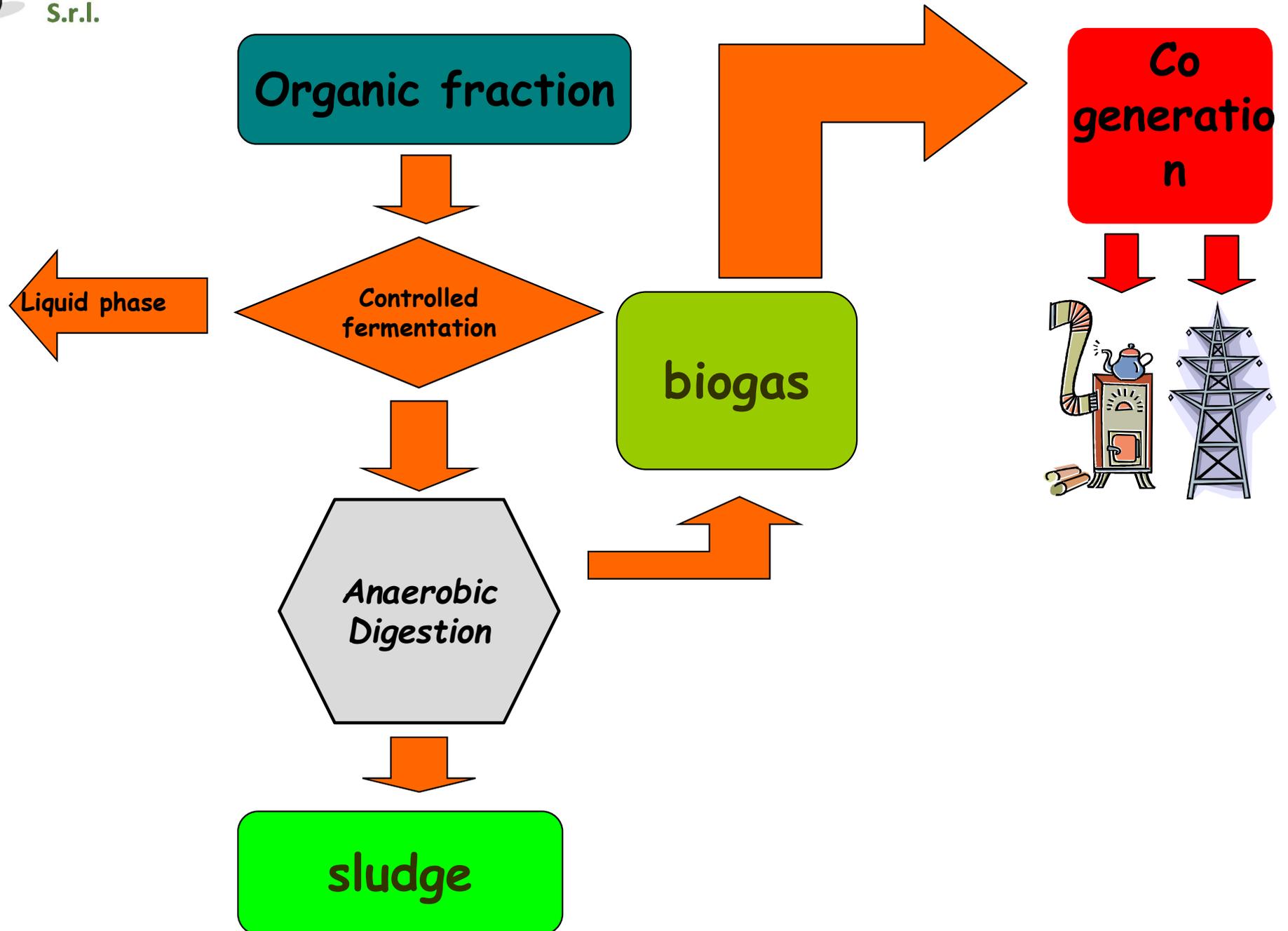


# ***1 - Anaerobic digestion from Organic fraction***

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# Process scheme



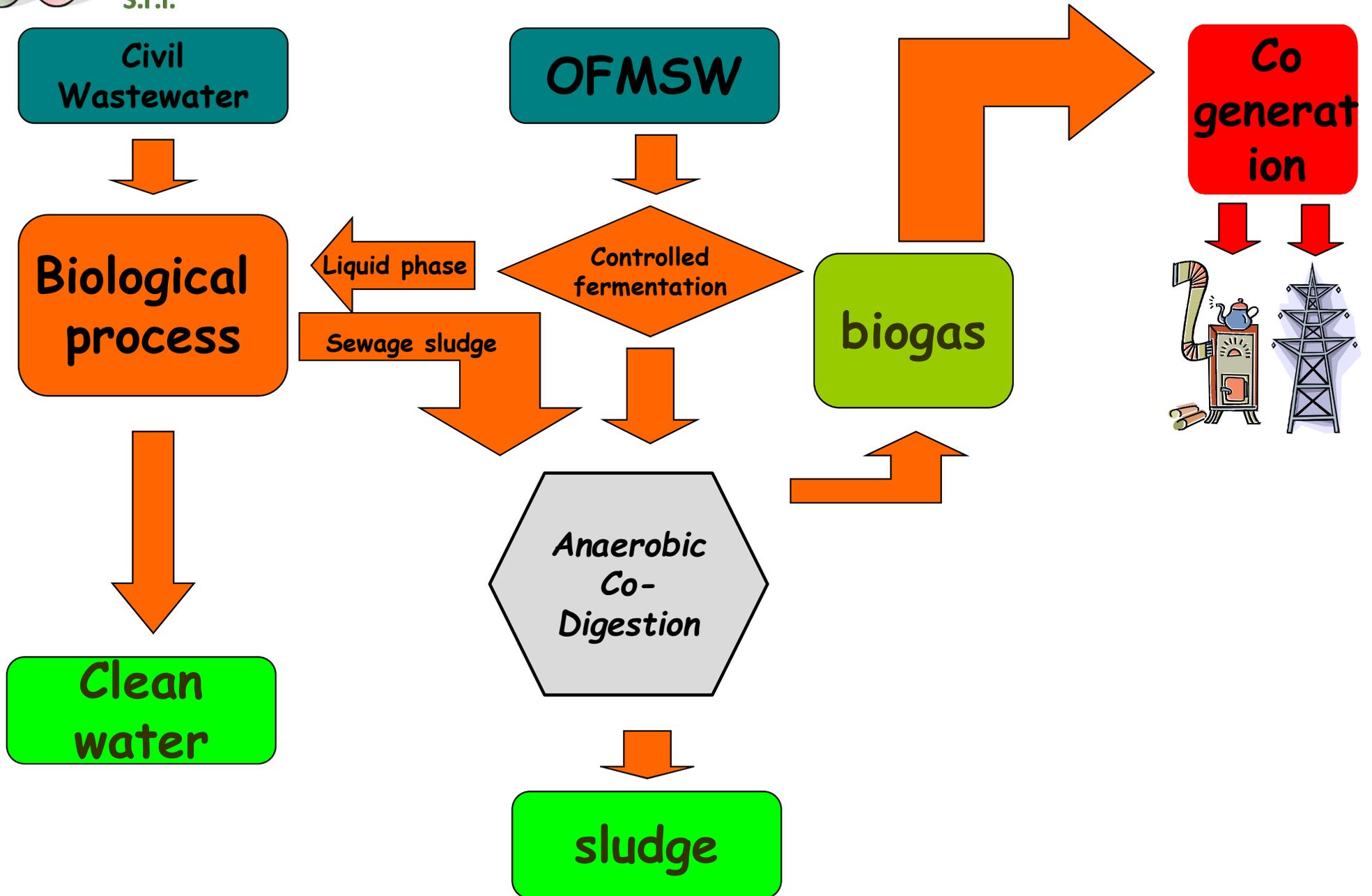


***2. Anaerobic co-digestion from Organic fraction  
and WAS (waste activated sludge) from  
municipal STP***

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# Process scheme

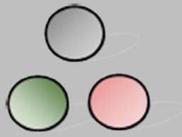




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***In both cases it is necessary to pre-treat the OF-  
MSW before feeding the Anaerobic Digester***

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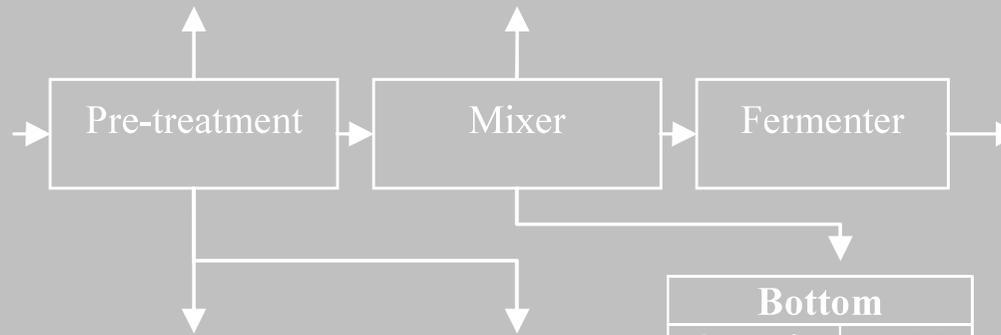


# Mass balance of OF-MSW Pre-Treatment

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
<b>Total</b>	<b>1000.0</b>

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
<b>Total</b>	<b>24.6</b>

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
<b>Total</b>	<b>88.2</b>

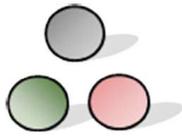


Screen	
Organic	45.4
Plastic	81.9
Metals	5.1
Glass	0.0
Textiles	7.0
Wood	2.6
Paper	12.9
Inerts	10.6
<b>Total</b>	<b>165.6</b>

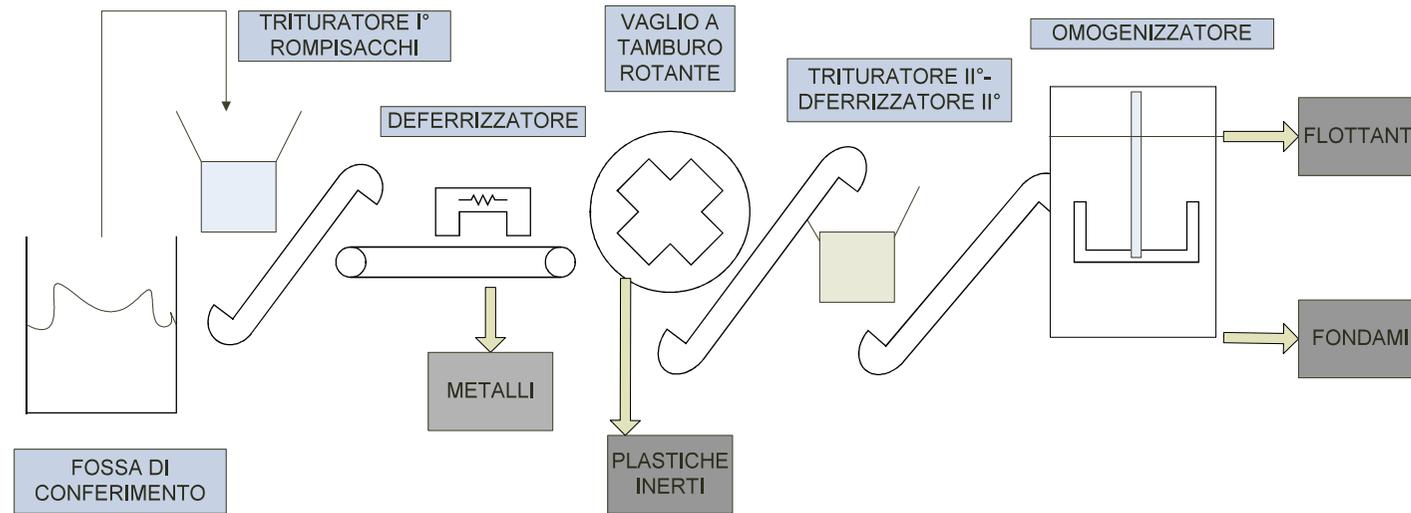
II° iron removal	
Organic	5.5
Plastic	0.4
Metals	2.6
Glass	0.2
Textiles	0.1
Wood	0.1
Paper	0.2
Inerts	0.3
<b>Total</b>	<b>9.3</b>

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
<b>Total</b>	<b>117.4</b>

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
<b>Total</b>	<b>595.0</b>



# Process chain of OF-MSW Pre-treatment



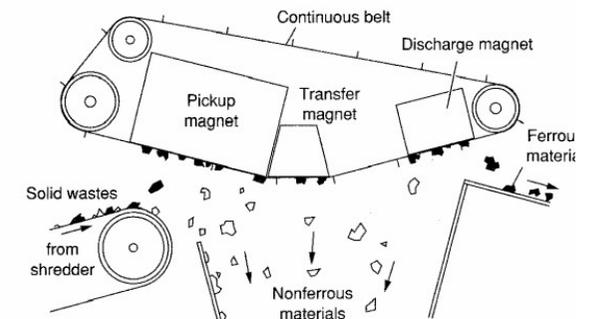
## Fossa di conferimento



## Rompisacchi



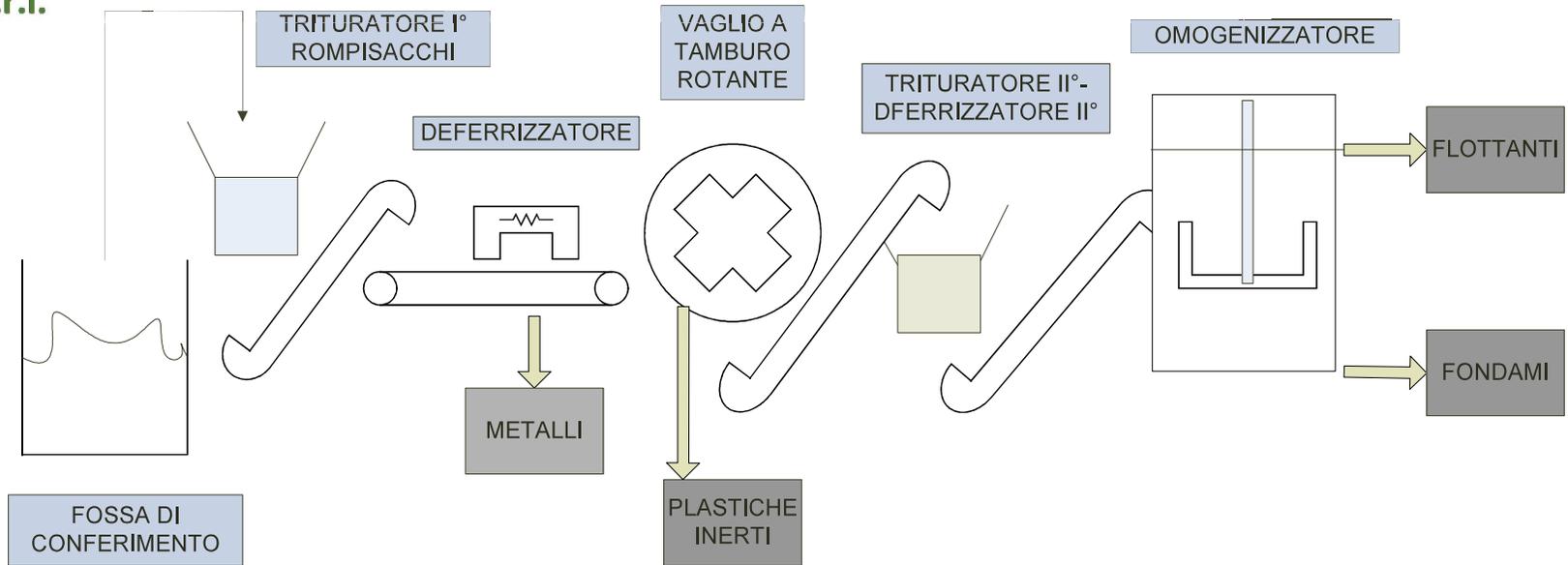
## Separatore magnetico





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# Process chain of OF-MSW Pre-treatment



**Vaglio**



**Trituratore**



**Miscelatore**

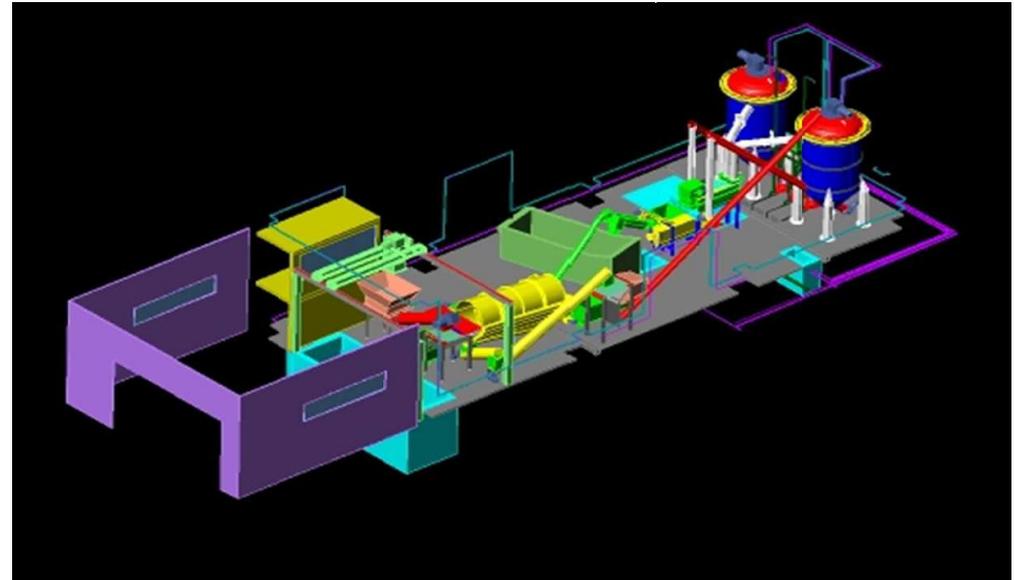


**Lavaggio scarti**

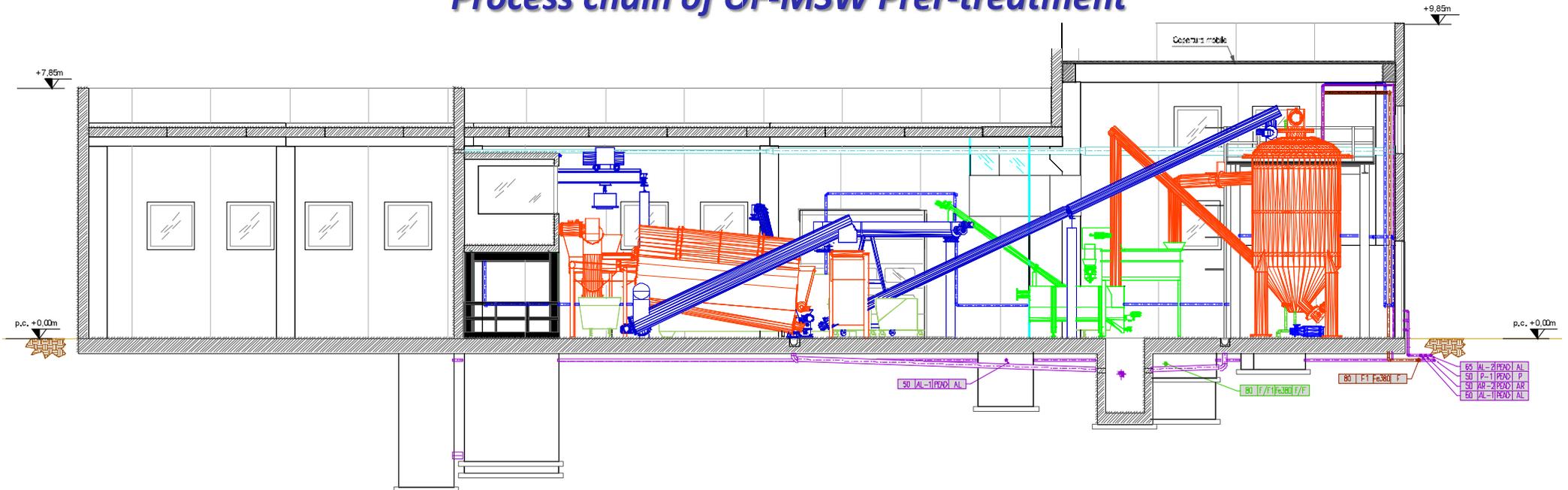




# Process chain of OF-MSW Pre-treatment



Process chain of OF-MSW Pre-treatment

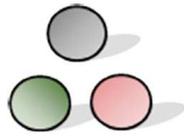




## ***Anaerobic digestion – Functional parameters***

<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<sub>IN</sub></i>	<i>0.3-0.4</i>
<i>TS<sub>IN</sub> - Total Solids</i>	<i>g/Kg</i>	<i>35-40</i>
<i>TVS<sub>IN</sub> - Total volatile Solids</i>	<i>g/Kg</i>	<i>59-62</i>
<i>pH Influent</i>		<i>6.5-7.0</i>

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## *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 consuption 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>m<sup>3</sup></i>	<i>1.7-3.0</i>
<i>Nitrogean back to waterl line to treat</i>	<i>PE</i>	<i>200-300</i>



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





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



**The waste as collected**



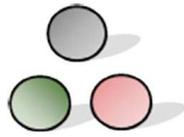
**The OFMSW treatment section**



**Co-generation unit (200 kWh)**



**Co-generation unit (200 kWh)**



# References

