

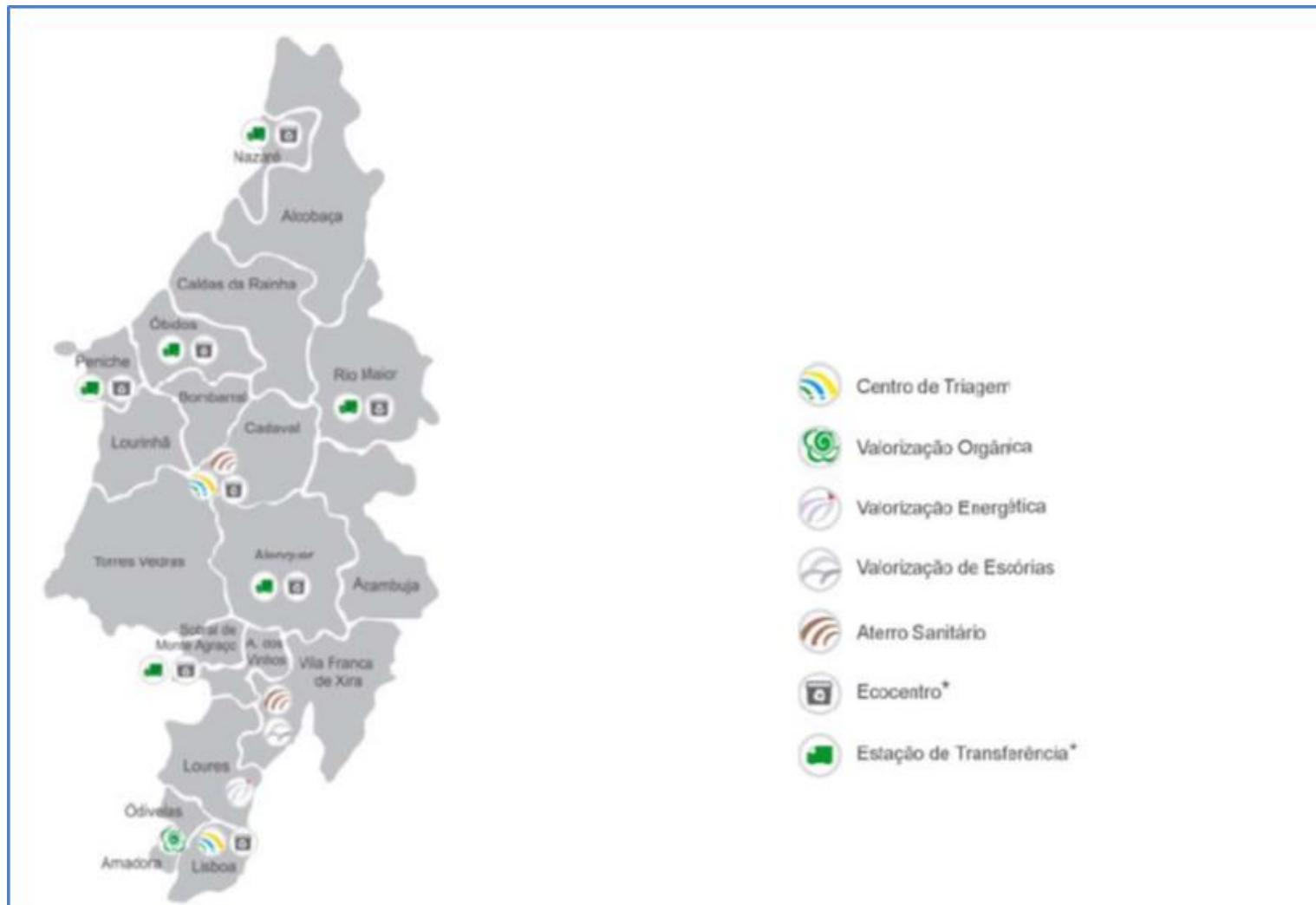
CASES DIGESTERS in PORTUGAL

Aula N

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- VALORSUL Valorização e Tratamento de Resíduos Sólidos das Regiões de Lisboa e do Oeste, S.A., is an inter-municipal company for the treatment of Urban Solid Wastes in the Lisbon and West region. VALORSUL is owned in 57% by EGF – Empresa Geral de Fomento S.A., in 40% by the 5 municipalities in the Lisbon region (Lisbon, Loures, Amadora, Vila Franca de Xira and Odivelas), and 5% by a non-profit association (AMO MAIS).
- VALORSUL serves 1.6 million inhabitants and ensures the treatment of approximately 900 000 ton/year of Municipal Solid Wastes (MSW), representing about 20% of waste quantity produced in Portugal. To ensure the treatment of MSW produced in its intervention area, the company has several facilities/infrastructures, as shown in Figure 1. The capitation is about 1,3 kg/people/day, which represents 472 kg/people/year.

Intervention area of Valorsul and localization of the facilities





- VALORSUL Company facilities: 1 sorting center, 1 incineration plant with energetic valorization, a metal recovery from slags, 1 landfill and 1 Organic Valorization Plant (ETVO).
- The Organic Valorization Plant of VALORSUL (ETVO), is located in the Lisbon region, it has relevant dimension, and it has been the first large scale anaerobic digester in Portugal. It is the only unit that receives organic bio-waste from selective collection and treat them by AD. Being a positive example in the country.
- This facility receives the organic waste collected selectively from catering companies, from canteens, refectories and restaurants, wholesale food markets and retailers, garden cleaning, in the area of great Lisbon, being treated and valued by Anaerobic Digestion and composting. The facility, localized near Lisbon, produced in 2015 about 8000 MWh of electric energy from biogas and about 600 t/y of class 2A compost for agricultural and domestic use.



Panoramic view of ETVO plant



- Currently the ETVO plant is treating about 40 000 tons of organic matter per year and in the future will be increased to 60 000 t/y.
- The Digestion system is based on LINDT technology wet digester. It is composed by a pretreatment of maceration, dilution, grit removal and pulping. Than the waste is fed to a hydrolysis-acidification tank (600 m³ of capacity) followed by two complete mix wet digesters (each of them with 3400 m³ of capacity), working at thermophilic temperature (51°C). The digestate is centrifuged and the solid fraction is composted after joining with grass (420 t/y). The liquid fraction is treated in a WWTP and reused to dilute the feedstock.
- The anaerobic digestion plant works quite efficiently producing more of 155 m³ of biogas for ton of waste and 725 m³/t Volatile Solids (VS), with 65% methane content due to its relatively high pH (8). The degradation is so high, that there is not enough organic matter in the dewatered digestate to run composting at adequate temperature for hygienization.

- So the operator has to add grass as supplement of organic matter for composting and structural materials to adjust moisture and viscosity. The digester, without grass addition, was producing just 14 kg of compost for ton of bio waste treated. Now it produces 33 kg/ton.
- The grass is delivered by the Lisbon region municipalities, without de payment of any gate-fee. Actually ETVO plant receives 1200 ton/year of fresh and clean material, totally used actually in composting.
- The compost has a low economic importance, once a portion of it is distributed freely to municipalities and the remaining is sold at 6-12 €/ton, according to the traded amount.
- Actually green wastes are used only in the composting process but there is an important potential of using them in the digestion process.

Green wastes from selective collection





ETVO digesters

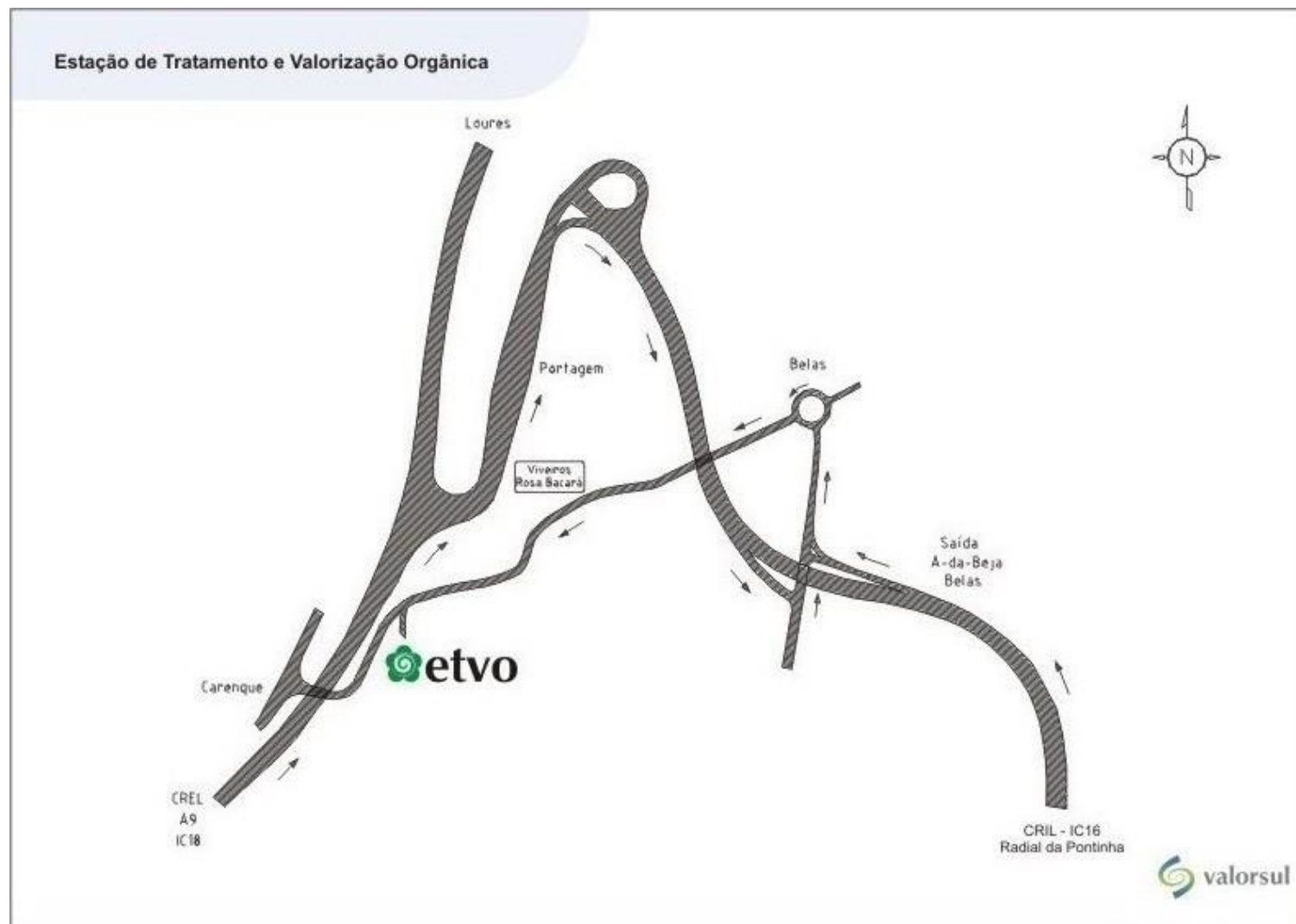




- The company plans to increase composting activity, in order to comply with the recycling targets fixed by the national plan for urban waste for 2020, reducing by 35 % of waste amount landfilled in 1995 (Directive 2008/98EC). Actually is planning to deviate from incineration to composting 5000 ton/year of grass waste, which may be increased in future to 8000 ton/year.
- The choice of composting is due to the lower investment, but this can be an opportunity to use the grass to AD
- During the meeting LNEG staff highlighted the following points:

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- The quantity of 5 000 t/ of grass correspond to a daily value of 1,6 t/day (320 working days) and to a volume of just about 5 m³/day. This amount could be fed without significant problems to the Digesters which have a large capacity, obtaining more biogas. More composting is unnecessary.
 - The system is provided with adequate pre-treatment, maceration, grit removal, pulping and hydrolysis and can be adequately adapted to accept grass with minor modifications.
 - These digesters have high ammonia content, reaching sometime 7000 mgNH₄/l, an inhibitory value according to the current AD literature. Fortunately the bacterial population seems to be well adapted to this condition. However the incorporation of grass will improve C/N ratio, making easier to run the digestion at thermophilic temperature and, may be, can increase biogas production from the added biomass.

Mapa ETVO





Dados do mapa ©2017 Google 200 m



Contact details



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● visita para dia 5 de Abril, às 10:00