

# Portugal turns to RDF

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Sociedade Gestora de Resíduos SA (SGR) invited MVW Lechtenberg in 2005 to develop a Refuse Derived Fuels (RDF) production plant. Since then, a detailed Study on available wastes and technical equipment was done. SGR is a subsidiary of Transucatas SA, which is one of the largest and independent, privately-owned waste management companies in Portugal.

In Seixal, Transucatas is running, among other activities, a sorting plant for commercial and industrial waste, as well as a landfill station for construction and demolition waste.

At the landfill site, delivered unsorted construction and demolition waste is pre-sorted and processed – the remaining inert fraction is kept under controlled conditions and regulations. During the last few years, the residues of the pre-sorting process have been accumulated on site. Now, due to contractual obligations, they have to be treated or removed as soon as possible. At SGR's sorting plant, pre-sorted industrial and commercial waste, as well as pre-sorted

Increasing fuel prices and decreasing cement demand on the Portuguese market are the main key factors for the cement industry to focus on higher substitution of alternative fuels. MVW Lechtenberg is developing the first refuse derived fuel production facility, owned by local waste collecting company, Sociedade Gestora de Resíduos, Seixal.



material from the Green Dot Association is segregated to obtain recyclable/valuable partial fractions.

In both cases the delivered wastes containing a high percentage of recyclables, such as plastics (PET, PE-HD, PP, PS), paper, cardboard and others, which could be reused and/or recycled. A high percentage of wastes consist of a fraction with high calorific value, which could be used as RDF to substitute fossil fuels in the cement industry.

In detailed sorting tests and analyses of the available waste, a basic concept for the production of RDF was developed.

Two main waste streams were analysed:

- High calorific value fractions from the sorting of construction and demolition wastes, such as carpets, wood, plastics, film, used cement bags and insulation materials
- High calorific value materials from sorting residues out of packaging sorting and recycling, such as paper, cardboard, wood, film.

During the sorting tests and waste evaluation, a high amount of chlorine containing plastics in the sorting residues from the Portuguese Green Dot system for recycling of packaging waste was found. A chlorine content of up to three per cent in the foreseen RDF fraction was detected.

Therefore, the technical concept for separating these chlorine contaminated PVC-olive oil bottles was developed. Special 'optical sorting systems' working with near-infrared technology were included in the concept.

Official data from the Portuguese Environmental Agency, concerning household waste show the following composition of the waste (see Table 1)

Based on the various types of wastes and the chemical composition, a multipurpose technical system was developed by MVW Lechtenberg. This technical concept allows SGR the sorting of (valuable) materials for recycling, the separation of foreign parts, such as stones and PVC and the processing into an RDF with a continuous high calorific value, low chlorine content and fine grain size without three dimensional parts for main burner feeding.

It consists of:

- Pre-sorting by MVW Lechtenberg's Cinderella<sup>®</sup> principle
- pre-shredding with existing shredder
- screening with huge Drum screen
- separation of 'light' and 'heavy' parts by air classification
- two manual sorting lines
- ferrous separation
- two optical sorters for PVC separation
- air classification for the separation of

**Table 1: physical composition of household waste (%wt)**

Product	%wt
Organic matter	35.9
Paper/cardboard	23.7 (25)*
Plastics	11.1 (9.5)*
Glass	5.6
Textiles	3.4
Metals	2.4
Wood	0.3
Inert	12
Others	5.7

Source: Agência Portuguesa do Ambiente

\* data from QUERCUS

foreign parts in 'heavy' line

- non-ferrous part separation
- final shredding
- classification of three dimensional parts for calciner feeding.

The whole plant will have a capacity of 60,000t RDF in the first step. Connections for an extension are already implemented. Engineering, supply and erection will be done by the German company Eggersmann, with equipment from famous equipment supplier's like Doppstadt, Lindner and others.

The finished RDF will be stored in an automatically storage area, protected against wind and rain with special fire protection systems. MVW Lechtenberg has mediated between SGR and Cimento Secil for a long-term supply contract and is responsible for the ongoing quality control of RDF at SGR as well as training of the staff. The developed technical concept and quality management system will ensure a continuous quality of the RDF as follows:

Sorting tests



- chlorine <0.6 per cent
- calorific value >21kj/kg
- humidity <10 per cent.

The content of heavy metals will be within the latest environmental protection laws in Germany and the EU, as well as the guidelines for the cement industry.

Total investment amounts to €3.5m, as

special attention was paid to the recycling of usable fractions like plastics, paper and cardboard.

SGR will extend the production capacity by mid-2009 to an amount of 130,000t RDF per year as a further concentration on the 'waste-to-energy' market is planned.