

# Away With Waste

## An overview

The use of alternative fuels, or refuse-derived fuels (RDF), is common practice in most European countries. In developed countries like Germany, with high disposal costs, RDF is substituting above 55% of the required heat consumption and, with "gate fees" of up to €30 per t of RDF, the cement industry is making a substantial profit.

In the Arab Union countries, RDF use is not yet well developed. Sustainable development aspects of cement companies, as well as increasing fossil fuel prices, are now forcing the implementation of all types of available and useable alternative fuels.

This article introduces the current status of RDF in the Arab Union countries.

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Lechtenberg,  
MVW  
Lechtenberg  
& Partner,  
Germany,  
outlines  
the current  
alternative fuels  
situation in the  
Arab Union  
countries.





## Morocco

The cement industry in Morocco is owned by the following groups:

- Lafarge (four plants, 5.4 million t, 40% market share).
- Ciment du Maroc/Cimpor (four plants, 3.5 million t, 26% market share).
- Asment Temara/Italcementi (one plant, 1.2 million, 9% market share).
- Holcim/Cior (three plants, 2.6 million t, 20% market share).

The predominant fossil fuels in Morocco are petcoke and coal, which must be purchased on the world market; therefore, the use of RDF is becoming more and more important. In July 2003 in Morocco, the cement industry association, APC, developed a commitment for the use of tyres as fuel. Since then, Holcim has imported and used shredded tyres from Europe. Permitting periods for the import of RDF or shredded tyres are, according to the Basle convention, very long and complicated. Holcim is therefore developing a concept for the use of various types of waste from the local market.

### Municipal solid wastes: sorting tests in Morocco

Other cement groups, which have founded a joint company, are developing the use of RDF. The main problem for plants is to secure different types of waste from municipalities (municipal solid wastes and others) on a long-term basis. Without long-term agreements for a secured waste supply, no cement plant is willing to invest in the necessary processing, dosing and feeding systems.

## Tunisia

The Tunisian cement industry consists of the following groups:

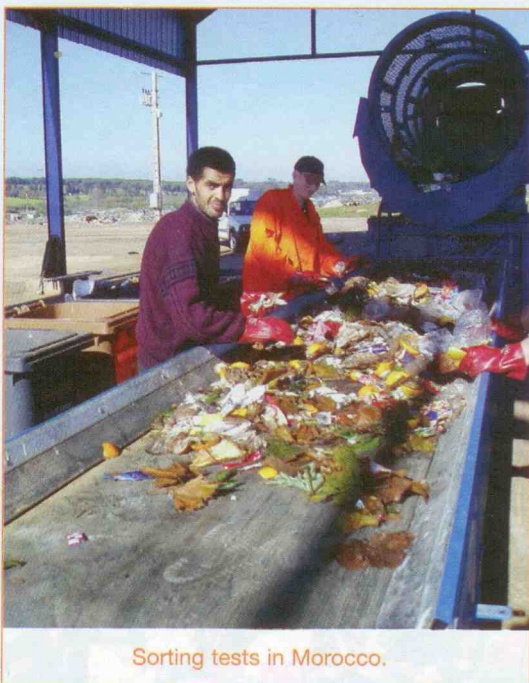
- Les Ciments de Bizerte (750 000 tpa, 10% market share).
- Societe Tunisa – Andalouse de Cement Blanc (304 000 tpa, 4% market share [Prasa]).
- Les Ciments d'Oum El Kelil (1.087 million t, 15% market share).



Olive husks/kernel feeding in operation.



Landfill site in Beirut.



Sorting tests in Morocco.

- Les Ciments de Gebel Oust (1.419 million t, 19% share [Cimpor]).
- Societe les Ciments Artificiels Tunisiens (CAT) (600 000 tpa, 8% market share).
- Societe de Ciment d'Enfidha (1.68 million t, 23% market share [Uniland]).
- Societe des Ciment de Gabes (1.16 million t, 16% [Secil]).

Some 70% of the energy requirement in the Tunisian cement industry is covered by gas (which is largely imported), and imported coal and petcoke cover the balance. Natural gas was under subvention from the Tunisian Government, but fuel prices are now within world market level. This creates a scenario that makes one consider alternative energy sources, such as RDF. MVW Lechtenberg is currently investigating the possibility of secondary fuel usage from household waste in Tunisia. Apart from the technical and operational economic information, social economic factors (currency export for fuel procurement, costs for waste disposal, etc.) have to be evaluated. The potential to save harmful gases (CO<sub>2</sub>, as well as methane from landfill) is also calculated. The Minister of Industry (MI), as well as the State National Agency for Waste Management (Anged), has already spoken directly with the Tunisian cement plants to realise the potential for reducing fossil fuel use. With the support of the German GTZ, a detailed study for the potential biomass and RDF has been carried out for the Tunisian Ministry of Environment.

The main focus is on high calorific value fractions from municipal solid wastes, but also olive kernels, sewage sludge and

others. Potential investors have been found to develop the first RDF production projects in Tunisia with the support of MVW Lechtenberg.

## Egypt

In Egypt, 13 cement companies operate a total clinker production capacity of approximately 37 million t. Eight multinational companies operate as strategic partners (Table 1).

The multinational groups in particular are beginning to introduce various types of alternative fuels. Alternative fuels currently used include coal sludge, sewage sludge,



oil-contaminated soils and tyres. As there is not a well-developed waste disposal system in Egypt (waste is mainly dumped at roadsides or in uncontrolled landfill sites), there is huge potential for the Egyptian cement industry to develop environmentally friendly concepts for the use of separated waste fractions for RDF production. MVW Lechtenberg is commencing the first feasibility studies for the use of RDF in Egypt.

## Lebanon

There are three producers in the Lebanese cement industry, manufacturing approximately 4.5 million tpa.

- Holcim (Chekka).
- Cimentiere Nationale.
- Ciment de Sibline (Secil).

The energy is mainly supplied through fossil fuels, (i.e. petcoke, coal and bunker oil). Using the example of petcoke, approximately 427 000 tpa is required. Since 2005, MVW Lechtenberg has been active in Lebanon; the potential to use RDF in the cement plants has been illustrated in various studies. With the substitution rate standing at 50% (i.e. 50% of the energy demand of the Lebanese cement plants will be covered by RDF), the total annual potential of the alternative fuels from waste stands at approximately 327 000 t.

In Beirut, Averda is successfully operating a waste collecting and sorting system, so there is big potential for the production and use of RDF. Even the government is supporting local cement plants to get things on the right track. Trials in 2006, conducted by Ciment de Sibline, have shown that there is no negative impact on the clinker production and environment.

Solidere (the Lebanese Company for the Development and Reconstruction of Beirut Central District s.a.l), located in Beirut, promotes the idea of the environmentally friendly utilisation of waste products that are a significant part of its work in clearance and rebuilding. Environmental friendliness is also an essential requirement for MVW Lechtenberg to meet and fulfil an order. During the civil war, all sorts of waste products were disposed of in a disorderly way at the Beirut harbour. As part of the city's development and clearance of the new waterfront site, Solidere took over waste treatment activities and environmentally friendly use of waste products, a function previously conducted by the former waste dump. MVW Lechtenberg has formulated an eco friendly concept for the production of RDF from these former dump sites.

## Jordan

There are currently three cement plants in operation in

Jordan. Lafarge Cement, the biggest player in the market, owns two plants (Rashadija and Fuhais). Arab White Cement is currently the second largest cement producer in Jordan, with Al Rahji Cement due to start two new projects.

In Jordan, SWS, a privately-owned waste treatment company is developing a project in a private public partnership. In a joint venture with the Municipality of Azarka, SWS and MVW Lechtenberg, around 190 000 t of municipal solid waste will be processed from a landfill site in Alkaider and Greater Amman area. The Environmental Minister of the Hashemite of Jordan is currently examining the concept, and the project should commence at the beginning of 2009.

Besides "typical" RDF from municipal solid wastes and industrial wastes, hazardous wastes and sludges will also be used as raw material for RDF production.

SWS, in conjunction with MVW Lechtenberg, is also planning a project with the City of Jineen in Palestine; contracts for this joint venture have already been signed.

## UAE

In the Emirates, the use of RDF is being further discussed. On the one hand, the boom development has led to increased waste; on the other hand, fuel prices are increasing and more environmentally friendly, sustainable fuel use is being developed.

In Dubai, the first trial production with RDF has taken place successfully.

## Conclusion

The cement industry can take on a significant role in the Arab Union's sustainable development with regard to waste disposal. However, suitable framework conditions must be created by the Governments first of all. Considerable waste volumes, even defined and suitable special waste such as oil sludge, dried sewage sludge etc., can be recycled in an environmentally friendly way in the cement industry.

Apart from immense potential savings for landfill capacities, harmful emissions are avoided and valuable energy resources are saved. Also, from a socioeconomic point of view, the transformation of such an 'environmental' concept makes sense: currency for raw material import is saved and new jobs are created in the collection, transport and processing of waste.

However, all this costs money, expenses that cannot simply be added to the cement industry's burden. Also, the waste producers (in this case the municipalities) must play their part in the costs involved in such a concept, to create a win-win situation. ●

Table 1. Companies operating in Egypt

Company	Strategic partner	Ownership
Beni Suef	Titan	100%
Alexandria	Lafarge	97%
Amereya	Cimpor	97%
Assiut	Cemex	96%
Sinai White	Aalborg	56%
Suez Cement	Ciment Francais	54%
Egyptian Cement	Holcim	44%
Sinai Cement	Vicat	42%