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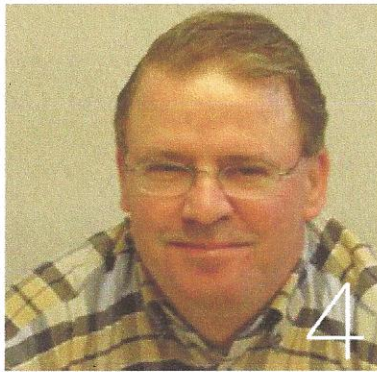
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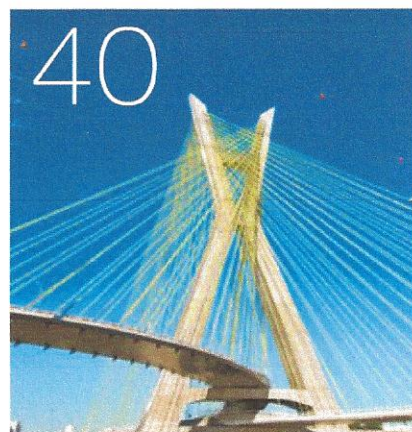
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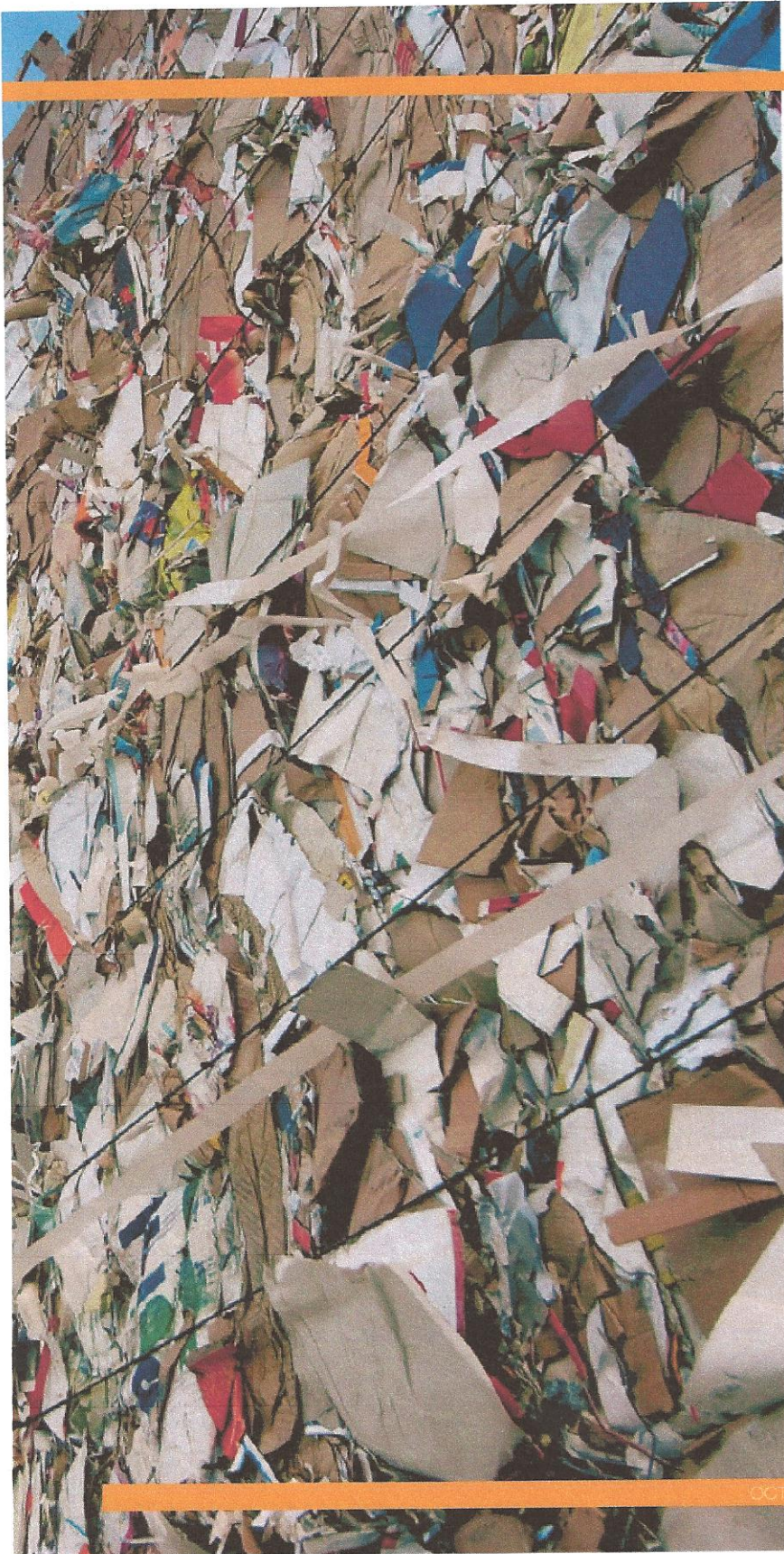


ALTERNATIVE FUELS

BUILDING NEW CAPABILITIES

The CW Group Publication Manager, Diana Heeb Bivona, sat down with Ed Verhamme, the General Manager of Alternate Resource Partners to discuss waste recovery and alternative fuel options as they relate to the cement industry.





CemWeek: The waste and cement industries have very different expectations and outlooks when it comes to the pricing of alternate fuels. How do they differ and why does it matter?

Verhamme: There are a number of big differences between the two. For instance, cement is cost-driven and waste management is revenue-driven. Cement, again, is also a cost driver while waste management is environmental-solution-driven. Thus, having a solution that is higher on the environmental hierarchy, e.g. co-processing versus landfill, is better and will be charged at a higher rate. Another big difference is the cement industry is not as customer-oriented whereas the waste industry is service-oriented.

This is an opportunity business. When the opportunity presents itself, you have to capture it and the waste industry, in contrast to the cement industry and the design of its decision-making process, is able to do that more quickly.

CemWeek: For a cement manufacturer, what is key to implementing a successful waste strategy?

Verhamme: What is important for your strategy is to know your cement plant. That is what we call the internal key factor. You have to know the waste market and you have to know the institutions, i.e., community organizations, municipalities and stakeholders in general. If one of these is weak, it will not sustain your alternative fuel resource (AFR) business plan. Therefore, you have to make sure that they are all strong and that you can implement it. That is why we do a pre-feasibility study first. We speak with the cement companies to identify what waste products they are looking for, go to the waste market, and see what is available, then report the findings. To that end, we have developed an Industry Base Waste Mapping tool that allows us to analyze the industry and what potential AFRs are available in that region around the ce-

ment plant. We need to determine what the industry looks like and it is important to do this beforehand. I will give you an example why.

We were called in to work with a cement plant that, in conjunction, with a waste management company, had decided to use oil filters as an AFR. The idea was to disassemble the oil filter that you use in your car, and that contains used lube oil, send the steel back to the steel manufacturing sector, and use the rest. The cement plant set up a processing/feeding facility to do this, but after six months, the cement plant was concerned they didn't have enough oil filter material to feed its facility. We were called in, and in this case, performed an after-market survey.

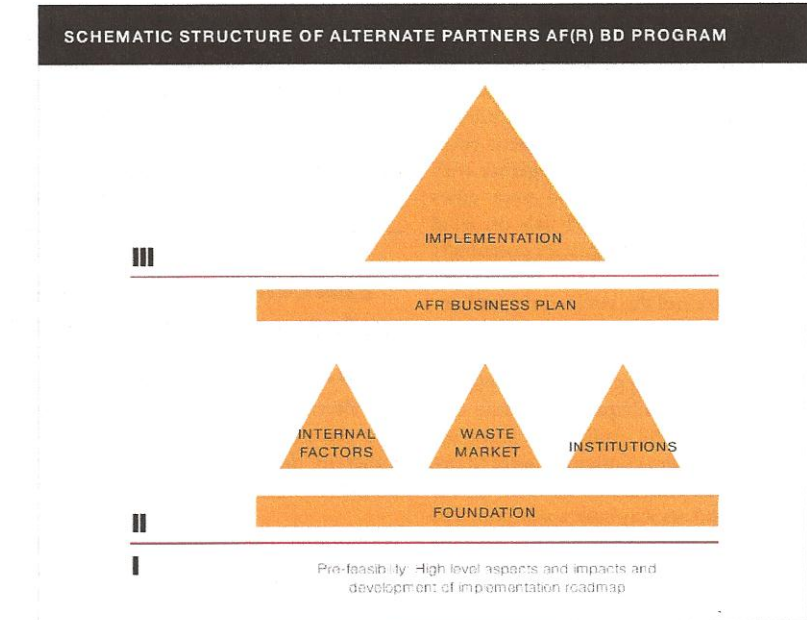
We found out that in order to maintain an adequate supply of filters, the cement plant would need to go much further afield – several states over in fact – thus adding more cost to the process. Unfortunately, it illustrates how the process was built according to the plant's needs without taking the market conditions in account. You have to understand what the size of the market is because if there is nothing, then it's either going to influence your price or you will not be able to use it and end up under-utilizing your installed capacity.

CemWeek: Do you find any challenges in implementing an AFR process in the emerging markets as compared to the developed markets?

Verhamme: Environmental enforcement is one big difference. The other is the level and cost of the various environmental solutions available in that specific area. Those are the two biggest differences seen.

CemWeek: You've referred to alternative fuel resource pricing as a moving target. What do you mean by this?

Verhamme: Pricing is very often not fixed and often, depending on various factors, can change quickly. For example, changes to environmental legislation



can affect pricing. What may have been considered normal practices with regard to disposing of items in landfills five years ago are no longer acceptable today and instead are separated and recycled.

In addition, pricing is opportunity driven. Animal meal is a very good example of this. There was a big problem with the disposal of animal meal. There was a huge volume of this and actually only one solution, which was co-processing it in a cement plant. That gave the opportunity to charge what they wanted and that is what they did. If the value of the solution is US\$300 and the costs are US\$30, the solution will still be charged the US\$300. This gave the opportunity to have a ROI of 12 months; after 24 months the opportunity disappeared as the animal meal volumes became much smaller due to other solutions being available.

CemWeek: How do the economics of alternative fuel vary across the regions?

Verhamme: Pricing is always relative to alternatives such as landfill, incinera-

tion, waste to electricity and recycling. Depending on the local infrastructure, that is what you are up against. I use the example of the UK where in 2004, they started with a landfill tax of £14/ton, which jumped in 2012 to £64/t and will rise again to £80/t in April 2014. You can imagine how the pricing of alternatives from materials that originally had gone into the landfills and that are now being used elsewhere changes. However, if you were to have that same waste in, say, India, where the landfill fee was £14/ton, this would be a completely different market. The point is there is no one market, even in Europe or the U.S. There are completely different economics because landfill costs vary so greatly not just throughout a region, but also sometimes throughout a country.

CemWeek: What can be done to make alternative fuel usage more attractive to cement companies around the world?

Verhamme: The cement kiln is actually the tool that can solve many waste problems, especially in emerging countries.

Ideally, emerging countries wouldn't have to build these waste management plants and could instead spend the money on infrastructure or elsewhere, if they could work together with cement companies to find a solution. However, cement companies would have to work together with the government, states and even cities to, in essence, educate officials on what a nice tool cement companies potentially have to solve many of their waste problems and to extol the environmental benefits co-processing can provide.

You see this in Egypt where people are talking about municipal solid waste collection because the landfills are filling up. Imagine if cement companies were to say, guarantee us roughly 40 percent of this material, and we may have a solution. For the other 40 percent you already have the solution of compost. Thus, for one ton of municipal solid waste, you only have to put 20 percent into the landfill and the other 80 percent can go either as a fuel or compost. It's a win-win solution.



One of the things the government should do, if they are serious about their environment, is to increase their enforcement, and that is something the cement companies should also be saying.

CemWeek: Waste products such as animal meal, solvent and car frag are among

down these days. Car shredding residues still have many heavy metals (Cu) due to cables in cars, and copper specifically has a very disturbing affect on the cement process. As long as they cannot take the copper out, it is not a viable alternative for the cement market.

"The cement kiln is actually the tool that can solve many waste problems."

the alternative fuel sources discussed. Can you provide an overview of the viability of these sources for the cement industry?

Verhamme: The animal meal market has already disappeared because of mad cow disease disappearing. Solvents are going down in volume now worldwide because many of the solvents previously used in paints and other processes are going

The other problem you have in the cement plant is you are typically competing against coal as your main fuel where many other industries are using heavy oil or diesel, which of course, gives them a big advantage when it comes to price. If they have to pay a certain price, it's still 50 percent of the oil price but for the cement kiln, it would be 100 percent of the coal price so why go to alternative fuels unless there is a CO2 credit to it?

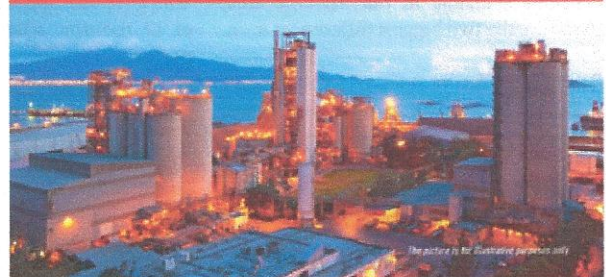
CEMENT EQUIPMENT ON SALE

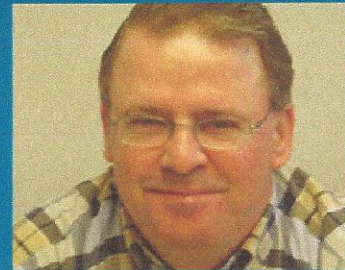
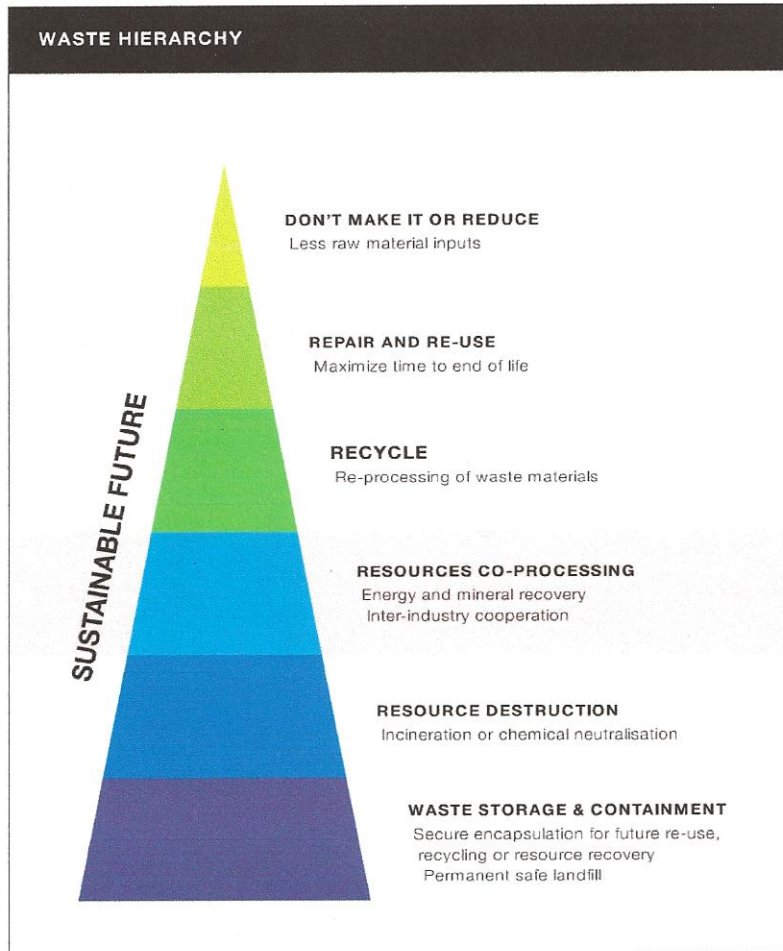
East European cement manufacturer
offers equipment for sale.

Including core elements of a Loesche LM 56.4 type roller mill
and a KHD rotary kiln (dia 4.8 m x 66 m length, 4'000tpd capacity).

All equipment stored according to manufacturers long term conservation
specification. Equipment has not been installed and can be considered as new.

For technical information call +36 30 549 5320
or e-mail: cemequipmentforsale@gmail.com





Ed Verhamme, an entrepreneur and General Manager of Alternate Resource Partners, has more than 30 years' experience in the industrial services, waste management and cement manufacturing industry. Over the 15 years spent at Holcim, Mr. Verhamme was instrumental in developing the resource recovery business of Holcim globally. Most recently, Mr. Verhamme was Sr. Consultant for the Corporate Industrial Ecology division at the head office in Switzerland and General Manager of the waste management affiliate of Holcim US. Mr. Verhamme received Bachelor degrees in Mechanical & Environmental Engineering as well as Environmental and Safety Management.

However, for me, at this moment, I see still a lot of industrial waste, both hazardous and non-hazardous, depending on the specifics of the area. I see a lot of waste of which could produce RDF or SRF. One big one is municipal solid waste and packaging waste from the industry. There is a company in the U.S., for example, that is collecting all the packaging waste, shredding it, putting it into cubes, and sending it to the cement plants, which are using it as an alternative fuel source.

CemWeek: How can cement companies go about building portfolios of alternative fuel resources?

Verhamme: Start by understanding the overall waste and resource market. It is important to also have an understanding of short and long-term market developments, i.e., legislation, new waste products, disappearing industries, etc. I'd also recommend having an assessment performed with regarding to the viability of alternative fuel sources.

Our company, Alternate Resource Partners' Industry Base Waste Mapping tool provides a first screening of the market by looking at industry and communities present in a specific geographical area and mapped in tandem with the co-processable waste generated by these indus-

tries/communities. When we combine these with "waste factors" per industry, we will typically identify between four and eight major waste streams, which then would need [to be] verified with a technical assessment of the present kilns and their state of operation (i.e., looking for bottlenecks like ID fan, residence time in calciner, etc.).

Once a company has decided to start with AFR, they can then build flexible installations and develop the correct permits to adapt to the fast changing waste market and the availability of certain waste streams. ♻️