



Case Study

Co-processing Waste Materials in Cement Production

Pre-processing of Waste Material

The Ecoltec Example, Mexico

BACKGROUND

Wastes come in different forms and qualities. The transformation of waste into Alternative Fuels and Raw materials (AFR) must meet certain requirements. Some types of waste cannot be used directly as AFR. A single waste stream, in the form of a liquid or solid substitute fuel, therefore needs to be created. This step produces an AFR that complies with the technical specifications of cement production, and which guarantees that environmental standards are met.

PROCESS

Ecoltec has facilities that process all types of waste. Agreements with the customers regulate the packaging and the collection/delivery conditions of waste materials. Transport is done in tanks or barrels or as bulk material by an external company. Liquid waste (e.g. waste oil, solvents, etc.) is mixed and stored in tanks before being fed into the cement kiln. Solid waste (e.g. plastic packaging, chipped tires, waste textiles etc.) and sludgy waste (e.g. paint residues, distillation sludges, oil sludge, etc.) are mixed with clean sawdust and then shredded. During the sieving process, the fine, solid mix is separated from the coarse mix and then forwarded via conveyor belt to the storage building. The AFR is now ready to be transported by truck to the cement plant.

QUALITY CONTROL

Quality control is an essential part of pre-processing activities. First, clinker production requires that the used AFR fulfils certain requirements concerning calorific value, ph-value, humidity, chlorine and sulfur content. Second, accumulation of pollutants in the cement and excessive air emissions must be avoided. Quality control takes place in the internal laboratory, where test samples of incoming waste and of AFR are held ready to be fed into the cement kiln. The test samples and records of the results of the analysis are stored for security and reference purposes. The results are reported to the authorities on a regular basis.

GOOD PRACTICE

The pre-processing activities are organized by Holcim Apasco's pre-processing subsidiary, Ecoltec. It offers complete waste disposal solutions to customers, independent of whether the waste is suitable for co-processing or not. Waste not suitable for co-processing is forwarded to companies with adequate treatment facilities. For the transport of certain wastes, plastic or steel barrels are used. The plastic barrels are shredded and used as AFR. The steel barrels are forwarded for recycling once waste is removed. The barrels are squeezed flat with a special machine before recycling.





Impregnated sawdust

FURTHER DEVELOPMENT

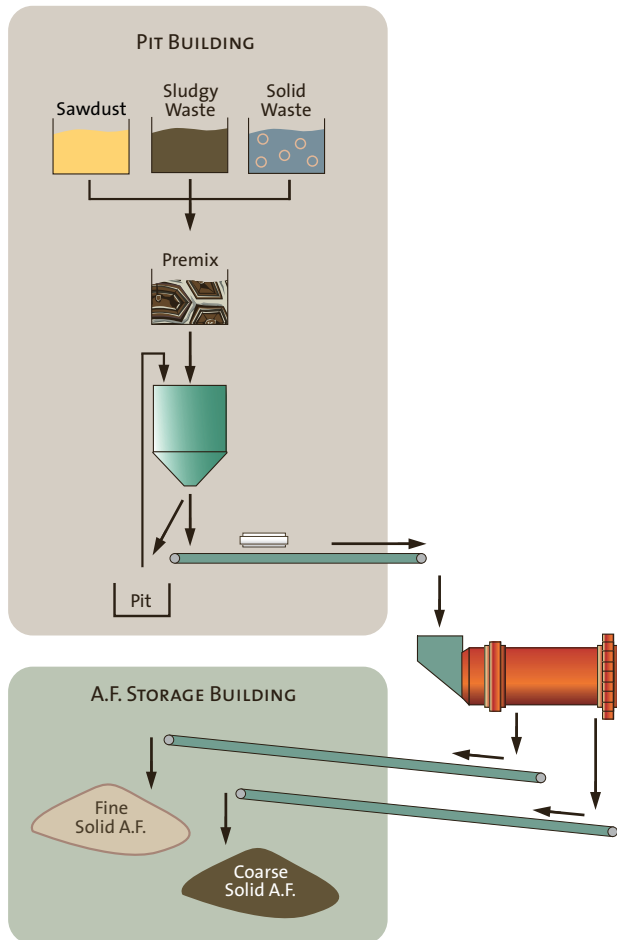
The mixing process of sludgy waste with solid waste is done in an open building. The Volatile Organic Compound (VOC) emissions from the sludge must be drawn away to protect occupational health. A monitoring program assesses environmental impacts so managers can decide if further measures are required.

VOC emissions are involved in the formation of summer smog. Common reduction techniques are nitrogen traps, biological treatment.

LESSONS LEARNT

The many different types of customers and the analysis of their different wastes require attention. Problems encountered in the transformation process from waste to AFR and in the clinker production due to unexpected pollutants in the waste, can be avoided by a frequent analysis of waste samples and securing the traceability of the waste from the customer to the cement kiln.

The installation and running of pre-processing facilities requires development of strong relations with local communities. Their worries and fears about the negative effects of waste treatment needed to be overcome. So Ecoltec planned a series of open days for the public that included a plant tour. Beside the general rules for pre-processing, special regulations are required for certain wastes such as persistent organic pollutants. Although not critical from a technical point of view, there remain public concerns about the formation of dioxins and furans during the combustion of POPs.



REFERENCES
coprocec@fhbb.ch