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No. 139 Pollution Prevention Case Studies

Fuel Diversification in Cement Manufacturing

Company	Cemex Alcanar (Spain)
Industrial sector	Manufacture of cement, lime and plaster ISIC Rev. 4 no. 2394 (International Standard Industrial Classification of All Economic Activities)
Environmental considerations	Cemex's policy in recent years is in line with the criteria set out in Corporate Social Responsibility report. This policy goes beyond compliance with labour laws and regulations related to the environment, since it encompasses a range of practices, strategies and business management systems that seek to find a balance between the three pillars of sustainable development: economy, society and the environment. This strategy of sustainable development is reflected in concrete actions that Cemex has undertaken in the different areas in which such activity is carried out. Some of these actions are: - Reduced consumption of non-renewable resources. - Reduction of the environmental impact of activities. - Involvement in the neighbouring community.
Background	The cement manufacturing plant located in Alcanar (Spain) has occupied the site since 1967, when first clinker production line was launched. Since the beginning of its industrial activity, the Alcanar factory has always been concerned about the impact its facilities could have on the environment. For this reason, and to continuously improve environmental performance, since December 2000 the plant has implemented an environmental management system that complies with the requirements of standard UNE-EN ISO 14001:1996. In 2005 it was certified under the new standard UNE-EN-ISO 14001:2004. The factory has a clinker production capacity of 1,800,000 t/year (5455 t/day). The clinker manufacturing system uses dry kilns (Humboldt), and until 2008 the main fuel used in the clinker production kilns was coke. The final product is cement, produced by the clinker. The factory produces various types of cement, including the following: CEM I 52.5 N / SR, CEM I 52.5 R, CEM II / AS 42.5 R, CEM II / BS 42.5 R, etc.
Summary of actions	To reduce the impact on the resources provided by nature, the strategy undertaken by the company is based on the use of alternative fuels and raw materials in the cement manufacturing process, in order to reduce and optimise the consumption rate of natural resources and energy. The actions undertaken by the Alcanar cement plant over recent years are aimed at reducing the consumption of non-renewable resources through the construction of new facilities that use alternative fuels and raw materials in the cement manufacturing process. All these facilities are equipped with gas cleaning systems to prevent the emission of particles into the atmosphere during the transport of material within the plant. These systems mainly rely on filters. For example, currently, line number 3 has a bag filter that treats the gases from different material transfer areas to avoid dust generation. Two new facilities for unloading, conveying and dispensing alternative fuels have been constructed in furnace number 3. The main function of these installations is the constant introduction of alternative fuels into the clinker kiln burner, which is by the plant control system so that the amounts introduced into the furnace match the demands of the operating conditions.

Photo

The facility is located close to the cooling satellites of furnace number 3. The installation is comprised of two mobile storage units, bag filters, material transport conveyors, screening and scale metering and a pneumatic conveying system (airlock and blower to the oven's burner).

Balances

The total budget allocated to this project was €366,000.

The following table shows the evolution in time of the different fuel types consumed at the facilities.

	Fuel consumption (tonnes)									
	Traditional			Alternative						
	Coke	Fuel - oil	Coal	Soft coal	Rice husk	Pum-ice	Olive leaf	Plant pruning	Saw-dust	Refuse-derived fuels (RDF)
2006	189,088	409	0	3,007	7,614	1,230	197	3,379	0	0
2007	124,784	491	86,588	5,610	5,356	1,694	62	1,022	0	0
2008	95,596	455	48,303	2,374	3,969	1,640	579	4,985	0	0
2009	114,164	407	0	0	5,860	0	0	30,180	12,933	9,637

The company cannot provide up-to-date information on the current fuel cost reductions that this project has brought about, but it can assure that the investment has been profitable from an economic standpoint.

In addition, the positive results in decreasing fossil fuel consumption are remarkable, as the use of alternative fuels from biomass and other sources has reduced CO_2 resulting from cement production at the factory.

Conclusions

The company has invested in modifying its facilities in order to diversify the types of fuels that they used for clinker production. With this investment, dependence on fossil fuels has been drastically reduced and CO_2 emissions have dropped, since most of the fuels currently used are carbon neutral.

NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.

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