

# MedClean Propre Limpio



## No. 141 Pollution Prevention Case Studies

### Use of Sewage Sludge as an Alternative Fuel for Clinker Production

<b>Company</b>	Cemex Alicante (Spain)
<b>Industrial sector</b>	Manufacture of cement, lime and plaster ISIC Rev. 4 no. 2394 (International Standard Industrial Classification of All Economic Activities)
<b>Environmental considerations</b>	<p>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:</p> <ul style="list-style-type: none"> <li>- Reduced consumption of non-renewable resources.</li> <li>- Reduction of the environmental impact of activities.</li> <li>- Involvement in the neighbouring community.</li> </ul>
<b>Background</b>	<p>Since the beginning of its industrial activity, the Alicante 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.</p>
<b>Summary of actions</b>	<p>The project involves using previously dried wastewater treatment sewage sludge as an alternative fuel for the clinker production furnace. This material has a calorific value of between 3000-4000 kcal/kg and a density of 0.6-0.7 t/m<sup>3</sup>, which makes it an ideal substitute for the fossil fuels traditionally used.</p> <p>The benefits obtained are the following:</p> <ol style="list-style-type: none"> <li>1. Use of dried sludge as an alternative fuel, which prevents the combustion of other materials with a greater potential for environmental impact, such as coke, thus avoiding the depletion of natural resources and contributing to the reduction of CO<sub>2</sub> emissions in line with the content of the Kyoto Protocol on reducing greenhouse gases emissions.</li> <li>2. Removal of sewage sludge, avoiding the use of landfills and other less environmentally friendly solutions.</li> </ol>
<b>Diagram</b>	<pre> graph LR     subgraph NEW_PROCESS [NEW PROCESS]         WS[Wet sludge 57,000 t 20-25%] --&gt; TD[THERMAL DRYING]         HA[Hot air] --&gt; TD         TD --&gt; AS[Air]         TD --&gt; WS2[Water 43,588 t]         TD --&gt; DS[Dry sludge 13,412 t 85%]         DS --&gt; AF[ALTERNATIVE FUEL]     end     AF --&gt; CF[CLINKER FURNACE]     TF[TRADITIONAL FUEL] --&gt; CF     </pre>



### Balances

	OLD PROCESS	NEW PROCESS
<b>Description</b>	Usage of fossil fuels, such as coke, etc.	Substitution of 6% of coke with the dry sludge (13,412 t)
<b>Cost</b>	Cost of traditional fuel: confidential	Cost of sludge: confidential
<b>Total savings</b>		Cost of the sludge: <b>confidential</b> Estimated savings on CO <sub>2</sub> emissions due to the biomass component in the sludge: <b>15,500 t/year.</b>
<b>Return on investment</b>		Not possible to calculate due to the confidentiality of some data.

### Conclusions

The sewage sludge drying plant at the Cemex España, S.A. clinker production facility in Alicante allows the sludge generated in the production process, which has been previously dried, to be used as a fuel for the clinker furnace process, hence reducing the consumption of fossil fuels and avoiding the environmental impact caused by the sludge being deposited in landfills.

An estimated reduction in CO<sub>2</sub> emissions of 130.000 t/year has been achieved, taking into consideration the energy consumed in sludge drying (if not used for this process), fuel consumption reduction and the lack of a need for landfill disposal.

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



Regional Activity Centre  
for Cleaner Production

Dr. Roux, 80  
08017 Barcelona (Spain)  
Tel. (+34) 93 553 87 90  
Fax. (+34) 93 553 87 95  
e-mail: cleanpro@cprac.org  
<http://www.cprac.org>