

Centre for Cooperation with the Private Sector/PPP

1. OVERVIEW

Short Title of Measure

Drafting and Model Application in Selected Countries of Internationally Recognized Guidelines Governing the Co-processing of Waste Materials in Cement Production

2. DESCRIPTION OF THE MEASURE

Development-Policy Context

The uncontrolled disposal of hazardous and problematic waste¹ constitutes a worsening problem in developing countries and countries in transition. In most such countries, wastes are preferentially disposed of into the sewerage, burying or burning them on company premises, illegally dumping them at unsuitable locations, or dumping them together with household refuse on landfills that fail to meet requirements and standards for the final disposal of hazardous waste in an environmentally sound manner. The consequences include contamination and pollution of the soil, water resources and the atmosphere, leading to sustained deterioration of the living conditions and health situation of the population. In more than a few cases, highly toxic substances and persistent compounds (e.g., dioxins) escape into the environment, are spread by airborne pathways over large areas, and, by way of the food chain, have negative effects on human and animal health.

This increasingly critical development is attributable to the following circumstances:

- Very few developing countries possess an appropriate technical infrastructure for disposing of hazardous waste in a controlled, environmentally sound manner (treatment, incineration or deposition) or are just in the process of installing them;
- Either there are no laws governing the controlled handling of hazardous waste, or the existing laws are not being enforced;
- Hazardous waste management cannot be applied and implemented for free. Uncontrolled disposal (illegal dumping, backyard incineration, etc.) is usually the cheapest way for a company to get rid of its special waste;
- At the policy level, the subject of hazardous waste management receives very little attention, or the problem is repressed. Little or nothing is known about the consequential damage to human health or the high cost of remediating the damages caused by uncontrolled waste disposal. At the same time, either international competition or the desire to make a maximum profit in as short a time as possible keeps many entrepreneurs from factoring the cost of orderly disposal into the prices they charge for their products and services.

While globally active, large-scale enterprises have begun to apply higher standards in developing countries, and are trying to take care of their own waste disposal problems, local small and medium-sized industries, enterprises, health care facilities and local governments continue to have scarcely any perspectives for the management of their special wastes.

The use of high caloric waste as derived fuels has been in practice for some years now in many developing countries. Used engine oil, automobile tires and hard plastics are often used as substitute

¹ "Hazardous waste" is understood here and hereinafter as any waste that cannot be disposed of together with normal household waste and poses a high risk to the environment and human health. Hazardous waste is defined and classified, if at all, very differently from country to country.

fuels for cement production, for firing bricks and for the production of ceramics. Soft plastic also finds frequent use as a high-energy "fuel additive" for incinerating hospital waste. Sometimes, waste oils are used to fuel baking ovens. Such applications are advantageous to the extent that troublesome waste can be put to some good use. The problem, however, is that low-temperature combustion processes (400°C - 600°C) can release such extremely toxic substances as dioxins and furans. Also, the ashes that remain behind actually should be declared as special waste because of their harmful contents, but no importance is attached to that, so the problem of the contamination of the environment remains and is ultimately only relocated, not solved. In sum and almost without exception, the present practice of waste incineration in developing countries must be regarded as extremely problematic, and from the standpoint of the Technical Cooperation (TC) of Germany, it does not constitute an adequate path of disposal.

An Entrepreneurial View of the Initial Situation

Within that context, Holcim has adopted a cement production strategy based on the gradual substitution of fossil fuels and additives by secondary fuel materials that are already in use. The goal is the ecologically beneficial and economically viable utilization of high calorific waste materials as a contribution toward climate protection through the conservation of non-renewable primary energy resources. This also opens up a practical path of disposal for waste materials for which no economical, environmentally sound disposal alternative was available in the past. In 1998, with a view to implementing this corporate philosophy, Holcim established a "Corporate Industrial Ecology" department, and waste materials are now already being successfully utilized at 35 associated cement factories. Holcim's ultimate global objective is to increase the overall share of alternative fuels and additives (primarily old wood and tires, diverse plastics and dry sewage sludge) to 75% worldwide and – as far as technically achievable – up to 100%. Incoming and outgoing inspections ensure that there are no negative environmental impacts and that the amount of heavy metals in the finished cement is no higher than if coal, natural gas or oil had been used as fuel. It has been conclusively demonstrated that most of the heavy metals found in clinker are "natural" products of natural lime and marl. High combustion temperatures preclude the formation of furans and dioxins. Holcim has operations in 70 developing countries, mainly in Latin America and South-East Asia. In 38 of these, classic fuels such as coal and oil are being substituted in a step-wise process by high-calorific substitute fuels (Alternative Fuels & Raw materials, AFR).

Taking as a basis the years of experience gathered in Switzerland and other countries of Europe (Germany, Belgium, Norway), the question arises as to why such problematic substances as engine/transmission oil, automobile tires, paper mud, casting scrap, solvents and chemicals are not being used (without few exemptions, like the disposal of high toxic pesticides in a cement kiln in Tanzania²) as fuel in the cement factories of developing countries, i.e., why such a means of disposal has hardly been propagated, if at all, as an ecologically beneficial form of disposal in the international TC context.

Despite all the technical know-how which Holcim has collected, despite the declared intent of Holcim's corporate management to engage in responsible, sustainable waste management, and despite the group's initial technical groundwork, the company's attempts to substitute alternative fuels for energy resources at their cement factories in developing countries has only met with limited success. The main reasons for this are political reservations, legal uncertainties and a lack of waste-management schemes. Viewed against that backdrop, GTZ makes an ideal partner for Holcim, because GTZ is providing its partners with advice and guidance in a number of projects in the aforementioned areas. GTZ's development- and environmental-policy insight and the proximity of TC projects to political decision-makers are comparative advantages which GTZ can contribute into its cooperation with partners.

² Disposal of Obsolete Pesticides in a Cement Kiln in Tanzania – Experience with the Incineration of Dinitro-o-Cresol in a Cement Rotary Cylindrical Kiln in a Developing Country; Wolfgang A. Schimpf; presented at the 5th International HCH and Pesticides Forum, 25-27 June, 1998, Leioa/Spain

Together, such partnerships could contribute toward a significant reduction in the existing waste-disposal deficits of developing countries and constitute a strategic alliance offering benefits to all concerned, leading in particular to less contamination of the environment and to the preservation of natural resources.

Brief Description of the Project

Project Purpose: Drafting and Model Application in Selected Countries of Internationally Recognized Guidelines Governing the Co-processing of Waste Materials in Cement Production

Set to last 3 years, the cooperation will consist of three steps:

1. Processing of experience gathered to date and making it available to groups involved in the co-processing of waste materials at cement factories. This includes GTZ staff, Holcim and other cement producers, representatives of public authorities, scientific institutions, contractors using the waste material for other purposes, and non-governmental environmental organizations (such as Greenpeace, WWF etc.), including those taking a critical view of the incineration of hazardous waste in general and of the idea of co-processing in particular. This first step is intended to help encourage people to discuss the subject on the basis of acquired insight and to speak frankly about the chances it offers, the risks it poses, and the misgivings it generates.
2. Drafting of guidelines that will gain global validity and acceptance. This step will include identification of the various organizations' responsibilities, the development of regulations for occupational health risks (for both waste contractor staff and the entire workforce of cement works), and formulation of the technical requirements to be met by cement producers. A positive list of waste materials that could be used as secondary fuel for co-processing will be elaborated. An Environmental Impact Assessment (EIA) needs to be conducted for each cement works before facilities using secondary fuels go into operation. These guidelines will be drawn up by an international working group made up of global players such as the United Nations Environment Programme (UNEP) and the Secretariat of the Basel Convention (SBC), public institutions such as the Federal German Environmental Agency, and NGOs (Greenpeace, WWF etc). These guidelines are not intended to serve as codes of practice or draft statutes, but as a foundation for the respective countries' own guidelines. Additional limiting values, for example, may vary from country to country, depending on the existing legal framework or on the quality of the raw materials used for producing clinker in each case. Once lessons have been drawn from step 3, these guidelines will be reviewed and amended as necessary. One of the aims will be to incorporate the guidelines into the Basel Convention. (Note: The responsibilities of the Secretariat of the Basel Convention include the drafting of international valid recommendations for the transboundary movement of hazardous waste and its treatment and final disposal.
3. Amendment / updating of the guidelines for selected countries (Chile, Mexico, Morocco and a South-East Asian country). Holcim operates cement factories and promotes the use of alternative fuels in these countries, while GTZ already advises the respective environment ministries on waste management issues (special waste, municipal waste disposal, management of contaminated material). The guidelines will be amended on the basis of experience gained through implementing measures. In all selected countries a) the technological, organizational and legal preconditions for the recycling of selected waste materials will be created, b) the collection, conditioning and co-processing of the wastes in cement works will be implemented and c) the individual processes will be observed, documented and evaluated. This will include inspection of materials received and of outgoing materials, as well as analysis of emissions and of residues in final products.

While this strategic alliance offers plainly apparent advantages, there are still some critical points that will require clarification within the scope of a preliminary study:

- good knowledge of established disposal paths in order to recognize potential resistance at an early stage;
- prevention of the establishment of a rival disposal path if this is environmentally and economically equivalent;
- assurance of inspections of materials received;
- licensing of cement factories for the co-processing of waste materials;
- clarification of the requisite collection logistics;
- assurance of secure waste management if there is only one single company which will receive the recyclable waste materials.

The various actors will receive pertinent training at theme-dedicated workshops and take a fact-finding trip to Europe, where they will have an opportunity to become acquainted with some concrete practical examples. The trip will include visits to cement factories and talks with representatives of the competent authorities. In addition, the financial and macro-economic impacts will be analysed and evaluated, and recommendations on controlling and reporting will be elaborated. It may be necessary to advise and assist the responsible environment ministry with regard to the amendment, in some cases even the deregulation, of related laws. Particular attention will be devoted to the practical implementation of waste co-processing in the selected cement works. In-country GTZ projects will have a key function in preparing the activities, and in monitoring and evaluating the processes.

A Managing Board (or Steering Committee) made up of two representatives each from Holcim and GTZ will be responsible for implementing the project. This team will be supplemented by additional high-level actors and selected stakeholders. It will further be supplemented by a neutral coordinating body (FH Basel), whose responsibilities will include documentation of the project's progress.

Since this initial phase of strategic operation is to be expanded and consolidated in additional phases (outside of the PPP facility), the partners' responsibilities will also include the specification, discussion and exact definition of the further procedure for achieving the objectives. The Steering Committee will also be made responsible for this task.

Previous Activities and Links to Projects Already Under Way

Several years ago, GTZ began advising government agencies and communities on how to improve their municipal and industrial waste management practices. The advisory services being provided cover such themes as waste avoidance, recycling of valuable materials, promotion of private-sector involvement, optimization of production processes and such conventional activities as collecting, hauling and dumping at landfills. All this, of course, must also make due allowance for the respective social, economic and legal contexts and adapt the concept accordingly. Most of GTZ's project partners are regional and federal ministries and municipalities, but also includes small and medium sized enterprises and its associations. Experience drawn from past GTZ projects shows that, despite all endeavours to avoid and recycle waste, the ecologically viable management of residual waste is indispensable, and there is rarely any infrastructure in place for dealing with "special" household and hazardous industrial waste. Waste disposal by incineration in conventional thermal waste processing facilities is thwarted by the high cost of investment and operation. The co-processing of such waste in cement factories presents itself as a possible alternative – an approach that has been picked up on lately in the German TC sector and has been applied successfully in many European countries.

There are direct links to, among others, the following projects:

Hazardous waste management in Chile (PN: 01.2526.0)

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The Chilean environmental authority CONAMA received in 1994 the commission to coordinate the elaboration of a national hazardous waste management policy and make concrete proposals for improvement of such management. State control and monitoring of hazardous wastes can currently only be performed to a limited extent. At most 30% of the industrial wastes generated are consigned to controlled disposal or treatment. The new project relies greatly upon cooperation with the private sector in order to harness synergies and to contribute, through a longer-term private-sector interest, to positive development towards improvement of hazardous waste management in the country.

Decentralization of waste management in the federal state of Mexico (PN: 02.2196.0)

A strategy workshop took place in February 2003 with representatives of Mexican and German institutions (incl. the German Federal Ministry for Economic Cooperation and Development, BMZ) and organizations. It was agreed here that the environmental focus of development cooperation activities, which has been in place for years, is to embrace the field of waste and contaminated sites in addition to the field of energy. In addition to the ongoing project on "Decentralization of waste management in the federal state of Mexico" together with the environment ministry of the federal state of Mexico, and the project on "Institutional development relating to contaminated sites" together with the national environment ministry, there are plans to take up the issue of hazardous wastes once more. The previous hazardous waste project, concluded in March 2002, was restricted to the region of Mexico City. Activities have already been carried out within the context of that project (such as promotion of waste oil collection) that could be integrated into the present PPP project and, moreover, can be further expanded.

Environmental Programme in Morocco (PN: 99.2056.2)

The Environmental Programme in Morocco has carried out and conceived a range of studies and concepts in connection with hazardous waste management in the country. The national hazardous waste sector is to receive coordinated support. Today the combustion of hazardous wastes in cement works already plays a major role in Morocco. With regard to the framework conditions under which hazardous wastes can be burnt in cement works, the "Swiss directive" is taken as the basis. Morocco favours a private-sector solution, but a mixed structure is not completely excluded, so that cooperation with the PPP measure is desirable.

Chemical safety (PN. 97.2001.2)

The purpose of this project is to undertake pilot activities to show ways of improving chemical safety in developing countries and implementing it in a sustained manner to international standards. Partner countries are supported in their implementation of the Rotterdam (PIC) and Stockholm (POPs) Conventions and the institutional framework in the individual countries is strengthened. Within the context of the POPs Convention, activities are carried out in pilot countries: surveys to inventorize PCBs, analyses of dioxin and furan levels in the environment and studies to support pollution abatement (e.g. for the steel industry and crematoriums). Technical tools (e.g. poison information centres, chemicals guides) are trialled under the conditions prevailing in developing countries. Experience is now available in inventorizing and disposing of obsolete pesticides in developing countries (Mozambique, Zambia, Mauritania, Pakistan etc.). Within the context of a pilot activity, obsolete pesticides have been disposed of in an environmentally sound manner in a cement works in Tanzania.

Development-Policy Project Impacts

- The project will make a concrete contribution toward more ecological and economical management of selected waste materials.

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- The co-processing of waste materials in cement kilns is an alternative form of disposal that sensibly supplements – instead of competing with – the principle of "prevention – recycling – disposal".
- On the basis of a win-win strategy, the project promotes dialogue between public authorities and private enterprises, which is very important in the waste-management sector.
- Taking the co-processing of waste materials in cement kilns as an example, the project raises awareness and builds up technical know-how, which can have positive public-private developmental impacts across the entire waste-management sector.
- Dialogue with international NGOs and political decision-makers will take place on the basis of recognized scientific criteria, leading to better acceptance and a modified form of argumentation among divergent positions.
- It will improve the image of "waste" by introducing a transparent, beneficial form of utilization.
- Pressures on increasingly scarce fossil energy resources will be reduced and developing countries will be able to save foreign currency otherwise needed to procure costly raw materials.
- The substitution of such primary fuels as coal and oil with high-energy waste materials will help protect the climate.