

GTZ-Holcim Public-Private-Partnership on Co-processing and Resource Efficiency

1. OVERVIEW

Short Title of the Measure

Improvement of waste management in selected developing countries and increase of resource efficiency in the cement and construction industry

The project addresses the insufficient waste management (especially inadequate and dangerous disposal of waste) as well as high energy and resource consumption in the cement and construction industry in developing countries and emerging economies. Main reasons for these deficiencies are weak framework conditions, inadequate technologies, lack of capacities and know-how and limited access to information. The goal is to selectively improve waste management and to increase resource efficiency in the cement and construction sector. The expected impacts are reduced environmental contamination stemming from uncontrolled waste disposal, a partial substitution and optimization of fossil energy and natural resources.

2. DESCRIPTION OF THE MEASURE

Development-Policy Context

The waste sector in developing countries is regarded as one of the most problematic deficit services in urban and industrial infrastructure. Waste, including used oils, solvents, pesticides, PCBs, infectious materials or animal waste and many others, lack disposal options and are mostly disposed of in an uncontrolled way, contributing to pollution of the environment and health hazards. One option to reduce the worsening environmental and health problems stemming from the uncontrolled disposal of all kind of domestic and industrial refuse (hazardous and non-hazardous) is the co-processing of these wastes as alternative fuel and raw material in cement plants. For certain hazardous waste materials and in most developing countries, co-processing in cement plants constitutes the only technologically available treatment solution.

In addition, the cement industry is a major consumer of primary fuels and raw materials, contributing to CO₂ emissions and the depletion of raw materials: The production of 1 tonne of cement requires an average of 1.5 - 1.6 tonnes of limestone materials. 30 – 40% of the material is lost as carbon dioxide emissions to air during the production process (calcination reaction). Energy requirements of cement production typically account for 30 - 40% of the production costs. Each tonne of cement produced requires 60 - 130 kg of fuel oil and an average of 110 kWh of electricity. Co-processing can reduce the consumption of primary fuels and raw materials by using energy and material values contained in waste streams.

Although co-processing is increasingly being practised in industrialized countries, developing countries often lack the legal framework as well as the capacity and skills of the different actors required for implementing co-processing (core problem 1). Relevant authorities, waste managers and cement companies often do not cooperate well. Awareness and information on the challenges of co-processing regarding legal, operational and environmental aspects, health and safety as well as communication issues is lacking. Co-processing is therefore often not practised for many waste streams, and/ or the practice falls short of international standards. Conflicts can easily arise around co-processing due to lack of information and transparency. In addition, many cement plants need to improve both the implementation of environmentally sound procedures and health and safety measures, and also their means of communication with the public.

Other problems stem from the steady increase of construction activities which leads to increasing amounts of construction waste. In addition, rising conventional production of construction materials increases depletion of raw materials and environmental damage from material production. Since construction often goes along with demolition, and since lifetime spans of buildings in developing countries are comparatively short (e.g. China), waste from demolition also increases. Worldwide demand for construction aggregates is projected to rise close to five percent annually to over 21 billion tonnes in 2007. Countries like China, India, Indonesia, Thailand, Brazil, Mexico or Turkey will record some of the strongest increases. However, construction materials such as cement, aggregates or reinforcements such as steel have in common that their production is based on the extensive exploitation of natural resources: For example, the high steel demand from the construction sector is one of the major reasons for the steady increase of the world wide exploitation of ore for steel production. Prices for reinforcing steel almost doubled in the past two years. For the production of one tonne of steel, 25 tonnes of raw material have to be exploited resulting in significant negative impacts on natural habitats.

In order to respond to the increasing demand of aggregates, the use of reprocessed products like crushed concrete and glass, fly ash and slag, or by-products from the mining industries can substitute virgin raw material. Such solutions are often also cheaper compared to costly cement and reinforcements. In addition, research studies have already proven that the characteristics of non-cement binders or non-steel reinforcements respond to and satisfy quality requirements. Mainly due to the lower costs, the use of alternative construction material (ACM) could have a significant financial benefit especially in the low-cost housing sector.

Although a significant portion of construction materials could be replaced by ACM, these options are mostly not yet applied in developing countries due to lack of knowledge and insufficient regulatory frameworks (core problem 2). In many developing countries, integrated concepts for the reuse of construction wastes are therefore missing, resulting in a piling up of these wastes in streets and open places or in dumping of these wastes at the few sanitary landfills, misusing the scarce available disposal volume.

As a third subject it will be looked at how adequate and affordable construction material combined with new models of partnerships between material providers, craftsmen and beneficiaries could contribute to the implementation of new concepts for low-cost housing.

An Entrepreneurial View of the Initial Situation

Following the success of the first phase of the PPP, Holcim wishes to continue the mutually beneficial partnership with GTZ.

The sustainability of the Holcim business rests on two main thematic planks:

- the sustainability of the production processes – necessitating resource efficiency and the use of alternatives and recycled materials wherever possible to conserve natural materials.
- the sustainability of the product portfolio and access to new markets – suggesting the development of new business models to bring low cost housing to the world's poor.

The current strategy aims at a reduction of CO₂ emissions, to save energy costs, and to recycle waste material in the cement production process.

Yet, there is an increasing sense of responsibility to look at all dimensions of sustainable construction. Recycling of construction material waste, for example, the closing of material cycles, is an area Holcim wishes to explore further. And, of course, the company welcomes the opportunity to see more communities improve their waste disposal situation with the solutions the cement industry can offer.

It is with these broader environmental, societal and business issues in mind that the extension of the partnership with GTZ seems an ideal way forward to bring all relevant parties to the table. The partnership combines Holcim's technical knowledge with GTZ's development and policy expertise for jointly building-up professional knowledge and capacity within the private and public sector.

Together, the partners have the opportunity to make significant contributions in various developing and newly industrialized countries in the areas of waste management, the recycling of construction waste and alternative building materials.

Holcim expects that after the end of the PPP the company is respected as a competent and trustful business partner by the public sector and relevant stakeholders in the pilot countries. In an increasing number of developing countries, Holcim should also then be a trustful partner offering services for national and local authorities in the field of waste management. The company assumes that future framework conditions will favour the recycling and reuse of construction material. Also, the PPP should speed up the opening of new business opportunities regarding sustainable solutions for construction.

Brief Description of the Project

The objective of the project is "Improvement of waste management in selected developing countries and increase of resource efficiency in the cement and construction industry".

The new GTZ-Holcim PPP will continue to promote and anchor co-processing of waste in cement kilns in developing countries in a participatory way. However, the new PPP will be larger than the first one in two dimensions: i) more countries will be included in the PPP; and ii) more and new topics will be addressed:

In addition to continuing activities in four pilot countries, at least five additional countries will be included in the new PPP. Regarding the topics, newly emerging questions on co-processing of household and hospital waste as well as economic issues will be addressed. As a completely new area, the use of sustainable construction materials and the reuse of construction waste, also within low cost housing schemes, will be addressed.

The following two areas of intervention have been identified as most significant for an extended GTZ-Holcim PPP:

Area 1): Promotion of co-processing as an integrated part of solid waste management

Result 1: The waste management is improved in selected developing countries through increased and regulated application of co-processing.

The outputs under result 1, which comprise advisory services on co-processing such as provision of short term experts and sharing of experiences, will be extended from four countries to at least five additional countries. In these countries, the Holcim-GTZ international guidelines on co-processing will be promoted with relevant stakeholders (especially the public sector and NGO) through workshops, exchange of experiences, consultation meetings and inputs from experts. Capacity building activities will be organized depending on national priorities and demands. Within this context, the possibilities for an extended waste management service of the cement industry as partner of the local and national authorities shall also be explored.

Where necessary, trial burns in cement kilns with waste including persistent organic pollutants (POP) will be carried out, accompanied by environmental impact assessments.

In addition, the application of the guidelines on "Co-Processing of waste in the cement industry" will be promoted in cement plants, while increasing the co-processing of waste in line with the guidelines. Staff in cement plants will have to be trained accordingly.

Additional studies shall be prepared and promoted together with the Guidelines on economic aspects of co-processing, and on co-processing of household and hospital waste, and on other selected topics demanded by authorities and stakeholders.

The new PPP project will also facilitate the regional exchange of experiences between stakeholders from developing countries, for example in Asia and in Latin America.

Finally, the Guidelines and the PPP will be presented to bi- and multilateral development organisations as well as associations from the private sector for comments, support and participation, to identify synergies and to initiate alliances.

Use of outputs, area 1):

The international guidelines on co-processing will be used and consulted by authorities and the private sector as follows: The international Guidelines will be implemented in cement kilns, thus increasing sound waste disposal as well as raising environmental and health and safety standards. Through capacity building and dialogues, the international guidelines as well as additional studies, e.g. on economic aspects of co-processing, will be used or integrated when

developing national policies and legislation, waste management plans and concepts to dispose hazardous waste including POP. Results from trial burns are taken into consideration by authorities when permitting waste for co-processing. Co-processing will also increase for waste types not yet used on a wider scale, such as POP or pre-processed hospital and domestic waste. Lessons learnt from other countries of a region (e.g. Asia) will be taken into account when developing national strategies for co-processing. Last but not least, other organizations and donors will promote the application of the guidelines on “Co-Processing of waste in the cement industry” and co-finance the objective of the Holcim- GTZ project.

Area 2) Construction waste recycling, promotion of alternative construction material and low cost housing

Result 2: Concepts are developed showing the potential & significance of (a) re-use of construction and demolition waste, (b) alternative binders and (c) use of cement / concrete in low cost housing for its contribution to sustainable development in developing countries.

The core outputs of this component start with the development of a technical compendium on using secondary raw materials in the construction sector. This compendium will be promoted and discussed with the public sector, NGOs and other interested stakeholders in at least three developing countries. Also, projects shall be identified and promoted to demonstrate technical feasibility and financial viability of using secondary raw materials in construction sector. The promotion of sustainable construction materials shall also be included into pilot projects on low cost housing. From the pilot applications, proposals shall be derived to overcome barriers hampering the use of recycled and alternative construction materials. Finally, the technical compendium on closing material loops in the construction sector and the PPP shall be presented to other organizations for comments, support and participation, e.g. to the World Bank’s “Sustainable City Alliance”.

Use of outputs, result 2):

Once developed, the technical compendium on using secondary raw materials in the construction sector can be consulted and used by the construction sector and authorities for policies, regulations and/or strategies. Also, authorities and stakeholders will then be able to derive suggestions from demonstration projects for increasing the use of secondary raw materials in the construction sector. Low cost housing schemes will use sustainable construction methods. Finally, other organizations and donors will also promote the application of the technical compendium on closing materials loops in the construction sector, and their programs would contribute to co-financing elements of the Holcim- GTZ project.

Previous Activities and Links to Projects Already Under Way

a.) Strategic Alliance on Co-Processing of Waste in the Cement Industry (PPP 037-2003)

In July 2003 Holcim Ltd and GTZ established a Private Public Partnership agreement supported by the BMZ. The objective of the 3 year project (2003-2006) is the elaboration of internationally recognized guidelines governing the co-processing of waste materials in cement production and their model application in selected countries.

The project promoted successfully co-processing in 4 pilot countries (Chile, Mexico, Morocco, Philippines), rose significant awareness within international organisations and showed a worldwide interest and demand to build up capacities on co-processing. Since there is still a need to further anchor the concept of co-processing in developing countries, with other bi- and multilateral organizations, to promote the topic with the academe in developing countries, and to disseminate the gained experiences among NGOs and the civil society, a second phase of the project is being proposed (see result 1).

Around the strategic alliance on Co-Processing, many other activities and project ideas are continuing to emerge:

- Indonesia: PPP project with Heidelberger Cement on capacity building for emission analyses in the cement industry

- Ecuador: PPP signed with Holcim on Health and Safety issues referring to plastics from agriculture that are contaminated with pesticides
- Egypt: Cooperation proposal with by GTZ
- India, Indonesia and Costa Rica: Activities on Co-Processing by regular bilateral technical cooperation (integration)
- El Salvador, Vietnam, and Tunisia: Interest by GTZ projects on waste and decentralization
- Thailand, Jordan, Uruguay, Argentina, Brazil and South Africa: Interest of cooperation and requests for training and capacity development were forwarded by organisations or experts
- China: Joint agreement by the cement industry to promote co-processing (Lafarge, Heidelberger, Taiheiyu), also open for GTZ
- China: Interest by KfW in financial cooperation for co-processing
- Interest by UNEP Chemicals, the Secretariat of the Basel Convention as well as WWF in co-processing for disposing pesticides and POPs

Projects by German financial and technical cooperation as well as projects by international organisations are taking up co-processing readily because it presents a long sought solution to dispose wastes, pesticides and POPs in developing countries, and to promote sustainable development. The cooperation with Holcim offers synergies for reaching objectives of such projects.

b.) Projects or programs of GTZ where cooperation is ongoing or planned:

- Worldwide: Convention Project Chemical Safety (PN 04.2040.6)
- Chile: Management of environmentally hazardous special waste (PN 01.2526.0)
- China: Program on Environment-oriented Enterprise Consultancy Zhejiang (PN: 99.2064.6)
- Costa Rica: Program on Competitiveness and Environment (PN: 04.2049.7)
- El Salvador: Program on Advisory Services for Municipal Promotion and Decentralization (PN 02.2173.9)
- Mexico: Program on Environmental management and sustainable use of natural resources (PN 03.2462.4)
- Morocco: Environmental Program (PN 99.2056.2)
- India: Program on Advisory Services for Environmental Management (PN: 01.2063.4)
- Indonesia: Indonesian-German Environment Program (PN 02.2577.1)

Development-Policy Project Impacts

Through improving waste management in selected developing countries, and by increasing resource efficiency in the cement and construction industry, it is expected that the PPP will achieve the following impacts:

- Improvement of living and health conditions through enhanced ecological and economical management of waste materials including hazardous waste, pesticides, POPs and debris.
- Reduction of the consumption of fossil fuel and virgin raw material, thus contributing to an improved management of natural resources, reduced exploitation of natural resources, reduced degradation of intact habitats and reduced emission of greenhouse gases
- Reduction of environmental and social conflicts through a responsible (or balanced) exploitation of natural habitats.
- Promotion of partnerships for sustainable development, especially between the private sector and authorities, but also including NGOs and the civil society.
- Contribution to sustainable communities – both regarding waste issues, but also construction and living conditions – with a focus on low-cost housing initiatives.
- Contribution to a more sustainable building industry by closing the material loop in the construction sector.

- Promotion of innovative technologies in developing countries in the cement and construction sector.

The project therefore contributes in particular to the millenium development goals (MDGs) 7 – Ensuring environmental sustainability, and MDG 8- Creating partnerships for sustainable development.

Potential risks

Regarding the national regulatory frameworks both for co-processing and for alternative construction materials, national priorities might not include these topics, hindering an implementation (core risk). Elections and/or frequent personnel fluctuations in environment ministries often delay or hinder the implementation of frameworks for co-processing and waste reuse. Potential risks also include the fact that in most developing countries, costs for environmental damage are not included in prices for raw materials. This reduces economic pressure to replace virgin raw materials and fuels for the cement and construction industry, resulting in a lack of interest in co-processing in small cement companies, and in a lack of interest in alternative construction material in the construction sector. There might even be efforts undertaken by well settled businesses to lobby against the use of recycled construction material in order to protect their profitable market.

ANNEX:

PROJECT PLANNING MATRIX

Project Purpose/ Goal

Improvement of waste management in selected developing countries and increase of resource efficiency in the cement and construction industry

Proposed Indicators:

- In at least 5 additional developing countries selected waste materials not yet environmentally sound disposed, have been co-processed in the cement industry based on the GTZ-Holcim Guidelines
- Concepts for the reuse and recycling of construction waste, for promoting alternative binders and for low cost housing will be used in decision making processes (e.g. environmental authorities, construction and housing authorities, building associations, international development organizations, technical institutions)

Results, Indicators, Activities

Result 1: The waste management is improved in selected developing countries through increased and regulated application of co-processing

Indicators:

- In 5 countries national Guidelines have been approved by national authorities and are applied.
- At least 5 cement plants comply with the GTZ-Holcim Guidelines and respective national regulations (verified by a third party)
- Waste management for selected waste fractions has improved in 5 defined areas through co-processing (baseline study to be prepared)
- Communities and other relevant stakeholders confirm that they have been regularly informed about co-processing and its implication (communication concepts for 5 cement plants)
- Stakeholders (mainly from public authorities) are qualified to perform their designated tasks linked to co-processing (e.g. permitting, monitoring)
- The CO₂-emissions stemming from fossil fuels utilized for cement production have been reduced at 5 selected cement plants in developing countries by at least 10% on average

Activities (to be updated according to project progress):

- Discuss and agree the modus of support and advisory service requested by other countries
- Prepare and execute joint GTZ-Holcim sub-projects at country level
- Plan, implement and document pilot projects for waste types not yet used on a wider scale, such as co-processing of POP, household or hospital waste
- Carry out studies on specific topics such as financial and economical impacts or the instrument of LCA for defining the optimum reuse and treatment of selected waste fractions

- Explore the possibilities for an extended waste management services by the cement industry as a formal partner of the local and national authorities
- Organize regional stakeholder dialogues in Asia, and probably also in Latin America and Eastern Europe
- Provide tailor made training courses for involved staff from the public and private sector
- Communicate and cooperate with other cement producers, NGOs and local communities
- Build-up capacity on waste management and raise awareness especially among the public sector and NGOs.
- Carry out regular meetings with UNEP, WWF, the two Secretariats of the Basel and Stockholm Conventions at Geneva and in the regions as well as with other important key organisations for getting the Guidelines fully integrated into their strategy
- Present the project concept and country and sector specific activities to other organisations and initiate alliances for co-financing with bi- and multilateral development organisations and associations from the private sector

Result 2: Concepts are developed showing the potential & significance of (a) re-use of construction and demolition waste, (b) alternative binders and (c) use of cement / concrete in low cost housing for its contribution to sustainable development in developing countries

Indicators:

- In 4 countries the significance of alternative binders and construction waste as subjects for national sustainable development programmes has been demonstrated.
- 4 pilot cases demonstrate the financial advantages and the technical feasibility of alternative binders and the re-use of construction waste in developing countries.
- In one pilot project the potential of low cost housing is demonstrated through the collaboration of different actors (private sector, public authorities, NGO, beneficiaries etc.)
- All 3 concepts have been recognized by at least 1 international organization

Activities (to be updated according to project progress):

- Screen pertinent literature, and identify important stakeholders (from the private and public sector)
- Compile, process, interpret and document relevant experiences.
- Organize and hold meetings in selected countries with representatives of public authorities, the industry and NGOs to get a better understanding of their problems related to construction waste.
- Form and convene a group of experts for drafting concepts for the increased use of secondary raw materials (closing the material loop in the construction sector).
- Describe the legal situation, and call attention to critical points (barriers).
- Present the elaborated concepts strategy documents or technical guidelines to international bodies and industry associations.
- Participate in workshops to be engaged in the exchange of experiences.
- Prepare subsequent steps for the further development and application of the concepts.
- Generate binding national (technical) guidelines and, as necessary, propose amendments to related laws.
- Identify and join forces with development projects under execution with the aim to link the promotion of alternative construction material with low-cost housing schemes and community infrastructure projects
- Document the experience gained.

- Build-up capacity on inert waste management and rise awareness especially among the public sector and NGOs.
- Present the project concept and country and sector specific activities to other organisations and initiate alliances for co-financing with bi- and multilateral development organisations and associations from the private sector.
- Initiate a possible cooperation with the World Bank's City Alliance Programme.

