The cement sustainability initiative

our agenda for action

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World Business Council for Sustainable Development

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A joint commitment to sustainable development

As the business leaders of ten global cement companies, and members of the World Business Council for Sustainable Development (WBCSD), we believe that sustainable development is a fundamental challenge facing humanity today, and that our industry needs an agenda for action that will prepare it for this challenge.

Cement is an essential material in today's society because, as a major constituent of concrete, it forms a fundamental element of any housing or infrastructure development. Taken together, our companies produce approximately one third of the world's cement and operate in two thirds of the world's markets. Our businesses compete with each other, including on some aspects of sustainable development. As competitors, there are legal and practical limits to our abilities to cooperate and collaborate. But we also recognize that within these limitations there remain significant benefits for working together to explore what sustainable development will mean for the cement industry and our stakeholders.

Our desire to play a part in a sustainable future led us to create the Cement Sustainability Initiative. Over the past three years we have worked alongside our stakeholders and WBCSD to identify the key issues we need to tackle, and some potential solutions to the challenges they pose. In signing this document we are committing our companies to a series of joint projects and individual actions over the next five years. Perhaps the most important are those regarding climate protection and use of fuels and raw materials, issues where our industry can play a significant role in developing sustainable solutions.

The Cement Sustainability Initiative aims to increase both our contribution to sustainable development and the public's understanding of that contribution. A sustainable future cannot be achieved by a single industry acting in isolation. Some of the measures we have committed to can be implemented in the short term, and others will require a longer period of planning and adaptation, and the active involvement of other parties. We have therefore set out an action plan for the immediate actions we can take over the next five years, and the partnerships we need to develop to deliver them. We will report our initial progress during 2005.

We acknowledge that sustainable development presents our industry and our companies with long-term strategic challenges. Individually, each of our companies has already taken effective action on a range of environmental and social issues, and has achievements to be proud of. But there is still much to be done, and we have to continue to find ways of integrating strong financial performance with an equally strong commitment to social and environmental responsibility, and open, honest dialogue with our stakeholders.

This Agenda for Action has been developed through a long, careful process of exploring what sustainable development really means for our industry. We are extremely grateful to all those who have worked with us throughout this process, and we now invite all interested parties to join with us in ongoing discussion about how our industry can best meet the challenges of sustainable development.

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CEMEX

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President
Siam Cement Industry

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Chairman
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President
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Executive

summary

The Cement Sustainability Initiative is the joint contribution of ten major cement companies to sustainable development. Each recognizes the need to work together to tackle the barriers and challenges to positive change affecting the industry as a whole.

The purpose of the initiative is to:

- explore what sustainable development means for us and the cement industry.
- identify and facilitate actions that we can take as a group and individually to accelerate the move toward sustainable development.
- provide a framework through which other cement companies can become involved.
- provide a framework for engaging external stakeholders.

We have chosen to adopt an agenda for sustainable development in order to prepare ourselves for a more sustainable future and respond to the expectations of stakeholders around the world, who increasingly look to business to take a lead on social and environmental issues. As individual companies we hope to benefit from the new business opportunities created by sustainable development.

This Agenda for Action has been developed following a three-year program of scoping, research and stakeholder consultation looking at what sustainable development means for the future of the cement industry. It sets out a program of work for the next five years focusing on six main work areas that are detailed below. In each area there are two kinds of actions: joint projects, on which a group of companies will work together to tackle a specific environmental or social issue; and individual actions, which will be implemented by each company in its own operations, applying both innovation and best practice.

Climate protection
Implement an industry protocol, developed as part of the research program, for monitoring and reporting CO_2 emissions from the cement manufacturing process. Each company will set individual CO_2 emissions targets.

Fuels and raw materials
Develop guidelines for responsible use of all fuels and raw materials in cement kilns.

Employee health and safety
A Health and Safety Task Force will ensure delivery of effective systems of measuring, monitoring and reporting on health and safety performance. Companies will share their experiences to identify causes of accidents and to reduce injuries.

Emissions reduction
Develop an industry protocol for measuring, monitoring and reporting emissions, and individual companies will publicly report emissions targets.

Local impacts
Create guidelines for Economic and Social Impact Assessment by cement companies.

Internal business processes
Integrate sustainable development as a set of principles into management systems, relationships with business partners and relationships with civil society.

An invitation to join
Other cement companies are invited to join these activities, and third party stakeholder groups are encouraged to engage with the initiative.

Reporting progress
There will be an interim progress report on all of this work in 3 years' time, with a full report to be published in 2007. Individual companies will continue to report their progress on their own activities.

Why does the cement industry

need an agenda for sustainable development?

Sustainable development can be defined as development which meets the needs of people living today without compromising the ability of future generations to meet their own needs. It requires a long-term vision of industrial progress, preserving the foundations upon which human quality of life depends: respect for basic human needs and local and global ecosystems.

We have chosen to adopt an agenda for sustainable development for three reasons: to prepare ourselves for a more sustainable future; to meet the expectations of stakeholders; and to individually identify and capitalize on new market opportunities.

A role for the industry in a more sustainable future

Global population is rising, placing increasing pressure on essential natural resources such as land and energy. This makes it imperative for us to find ways of using these resources more efficiently. This need for more environmentally and socially sustainable development has become a key agenda for governments, NGOs and businesses. Cement is an important material in the construction of the infrastructure needed to support that development. We need to engage with that agenda, and understand what it means for our long-term future.

Some of the consequences for our industry are already apparent:

- Society is looking to energy and materials intensive industries such as ours to increase resource and energy efficiency in order to protect our stocks of natural resources.
- Poverty reduction and human rights issues are coming increasingly into focus as we expand our markets in the emerging economies of Asia, South America, Africa and Eastern Europe.
- Clients and customers in the construction industry are beginning to specify more environmentally sensitive building materials and methods.

We need to understand and adapt to all these changes.

A more sustainable future presents us with opportunities and challenges. That is why we need to work together and with stakeholders to both shape that future and prepare ourselves for it.

Meeting stakeholder expectations

Understanding the expectations of our stakeholders, and then responding appropriately, is crucial to the industry's ability to do business. Only by earning the trust and respect of our stakeholders will we maintain our 'license to operate' in communities across the world. Through constructive engagement we can understand the wider context and implications of our actions, make better business decisions as individual companies, and identify areas where we can work with our stakeholders to achieve common goals.

We know that external stakeholders want to see:

- A proactive approach to sustainable development. There is a widespread perception that business is part of the problem of 'unsustainable development'. We believe that we can and must be part of the solution.
- Greater transparency. Stakeholders want to be able to judge our performance for themselves.
- Evidence of significant actions, leading to real, sustained changes. This is driving demand for new and stronger regulation in many parts of the world.

We need to be able to respond to all of these expectations. But there are other factors too. Investors are showing greater interest in how businesses manage environmental and social issues, because mistakes in these areas are easy to make and can be very costly. Our ability to manage these risks and maintain a reputation as a successful and responsible industry may become an even more important factor in our ability to access capital in the future. Some of our existing and potential employees are asking similar questions about our contribution to society, and our ability to respond to environmental and social issues in the long term. This may have impacts on our ability to recruit and retain high caliber, committed staff.

Maximizing business opportunity

We are not simply being pushed by outside forces to develop an agenda for sustainable development. Many current practices, such as energy efficiency and quarry rehabilitation, are both essential elements of the business and key parts of an agenda for sustainable development. There is a strong business imperative to take advantage of change to meet new market needs.

These opportunities include:

- Process innovations leading to resource and energy efficiency, and cost savings in the long term.
- Product and service innovations which enable us to meet new demands for construction products with lower environmental impact.
- Working more closely with other industries to investigate use of by-product and waste materials in cement production.

Addressing these issues responsibly as individual companies, and as an industry, will inevitably strengthen our reputation in the market and with society as a whole.

Examples of new business opportunities

Photo-catalytic Coating
is an outdoor coating material made of special cement and titanium dioxide fixed in the cement particles. In sunlight it helps reduce nitrous oxides in the air (a part of urban smog) and maintains clean concrete surfaces

Shotcrete
is a special cement to meet the technical and environmental demands of tunnel building.

Concrete 'eco-columns'
are used for protecting dikes, dams and river embankments from erosion. Their design encourages local organisms to grow, allowing the columns to blend in with the natural embankments where they are used.

About cement

and the cement industry

What is cement?

Cement is a fine, gray powder which sets after a few hours when mixed with water, and then hardens in a few days into a solid, strong material. Virtually all the cement produced globally is mixed with sand, aggregates and water, and used to make concrete and mortars.

Concrete is second only to water as the most consumed substance on earth, with nearly three tons used annually for each person on the planet. Cement is the critical ingredient in concrete, locking together the sand and gravel constituents in an inert matrix. It is therefore a critical part of meeting society's needs for housing and basic infrastructure such as bridges, roads, water treatment facilities, schools and hospitals.

Making cement

Cement is made by heating limestone with small quantities of other materials (such as clay) to 1450°C in a kiln. The resulting hard substance, called 'clinker', is then ground with a small amount of gypsum into a powder to make 'Ordinary Portland Cement', the most commonly used type of cement (often referred to as OPC).

Many users require cement with particular properties, and these can be made by grinding additional constituents with the clinker. Typical additives include slag and fly ash, by-products from blast furnaces and power generation. Another is pozzolana, a type of finely ground volcanic slag. Mixed with lime, it acts like OPC, and will set under water.

Due to its use in construction, cement is made to strict standards. These standards can vary by region and may limit the type and amount of additive materials used.

Environmental Aspects

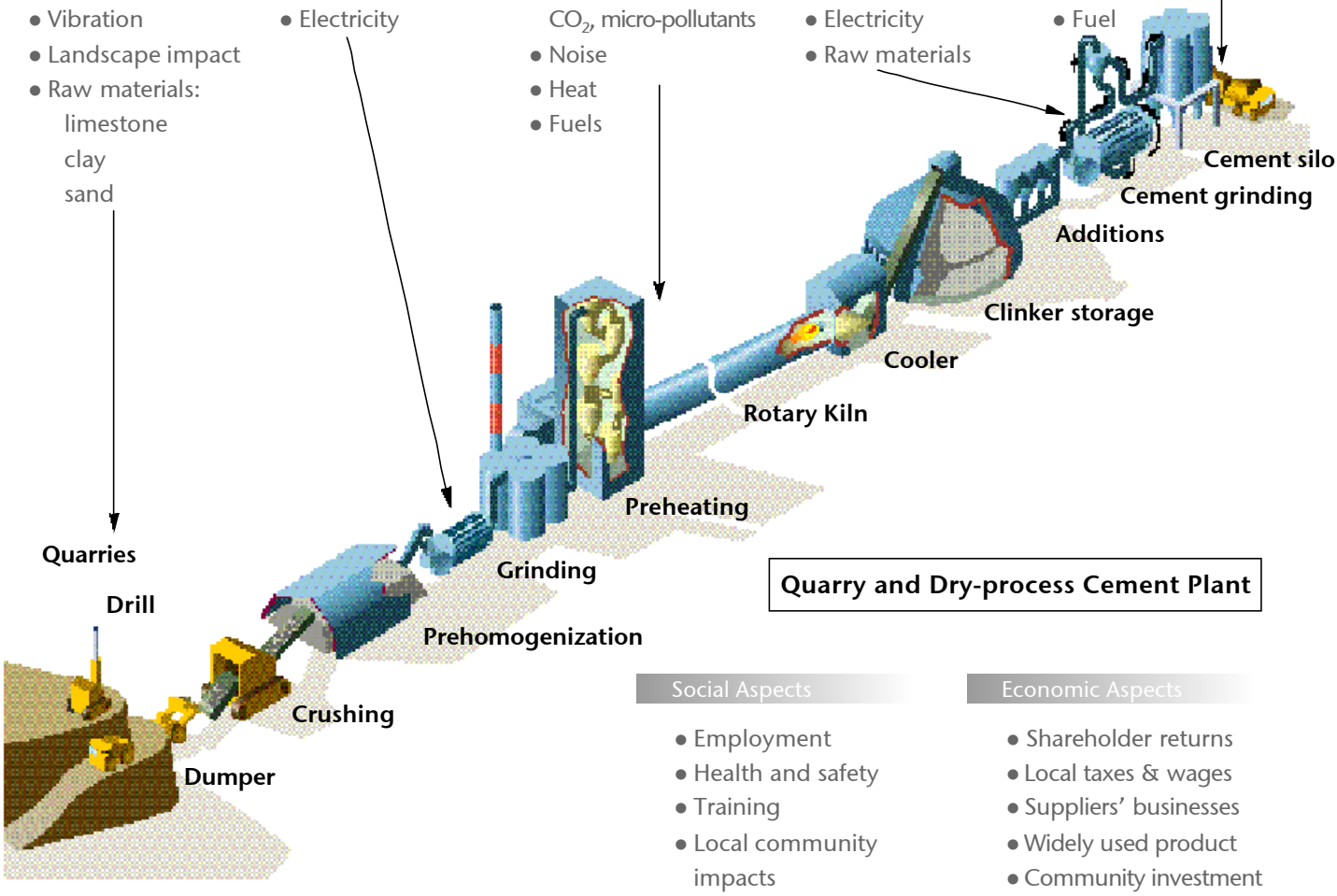
Quarrying
- Dust
- Noise
- Vibration
- Landscape impact
- Raw materials:
  - limestone
  - clay
  - sand

Grinding
- Dust
- Noise
- Electricity

Clinker Production
- Dust
- Gases: SO_2, NO_x, CO_2, micro-pollutants
- Noise
- Heat
- Fuels

Grinding cement
- Dust
- Noise
- Electricity
- Raw materials

Storage/shipping
- Dust
- Noise
- Fuel



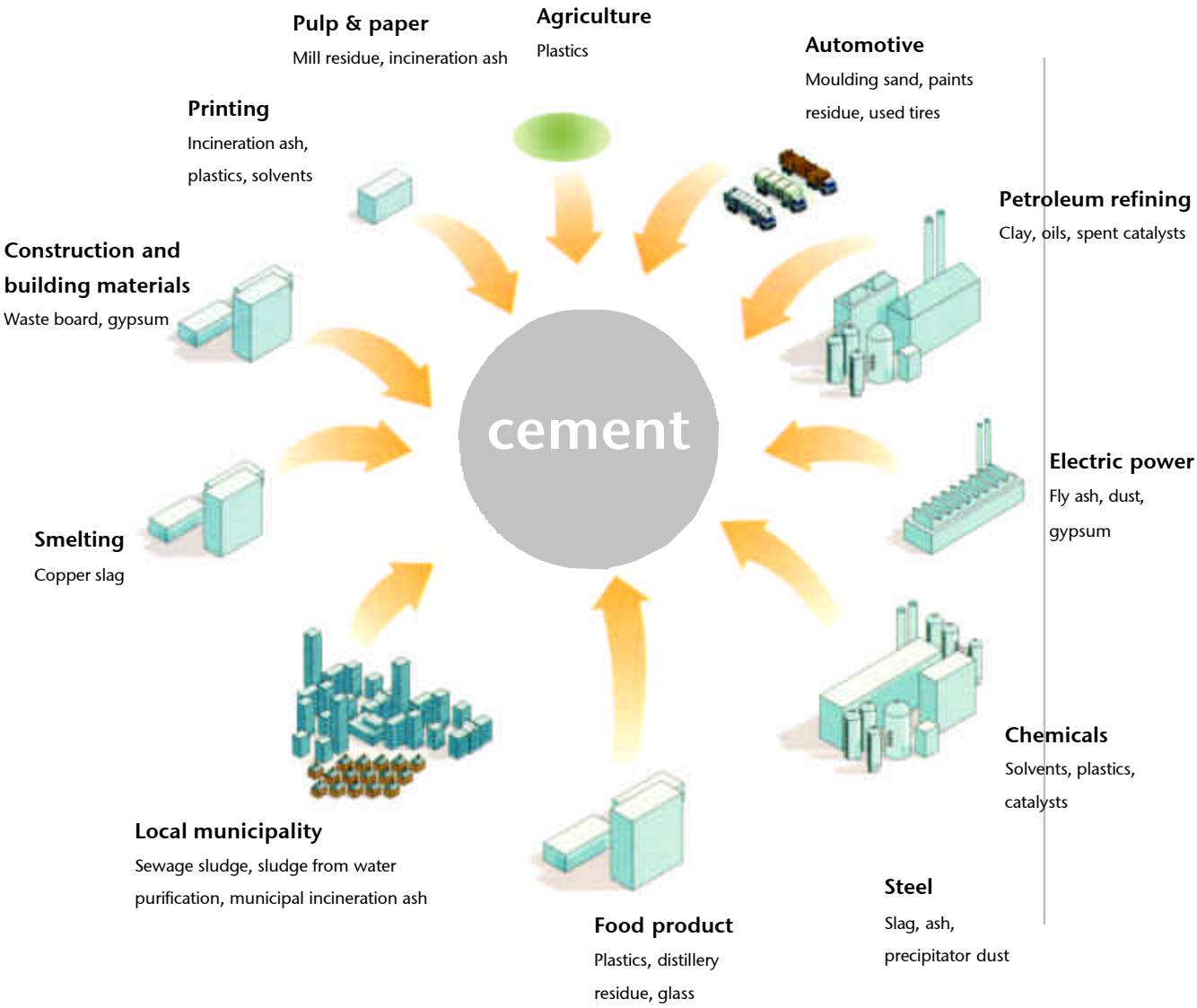
Quarry and Dry-process Cement Plant

Social Aspects
- Employment
- Health and safety
- Training
- Local community impacts

Economic Aspects
- Shareholder returns
- Local taxes & wages
- Suppliers' businesses
- Widely used product
- Community investment

Cement production as an ecosystem

Many industrial by-products and other waste materials can be recovered and used in cement manufacture. Some are incorporated into the cement, others provide fuel needed to convert limestone into cement. This diagram illustrates some of the materials being used by companies around the world. Not all of them are used in every country. Some are actively encouraged in some countries, but prohibited in others. For example, used tires are routinely burned as fuel in cement plants in Japan, France, and Germany. But this practice is controversial in several other countries. See page 22 for more details about the Cement Sustainability Initiative's work on alternative fuels and raw materials.



The cement industry

Cement-like products were used in Greek and Roman structures over 2000 years ago, but modern cement was first produced in the early 1800s. The industry has changed considerably since then, although much of the product remains the same.

Key features of the modern cement industry are:

A vital product
Cement is the key constituent of concrete, which is the second most consumed material on the planet.

A capital intensive process
The cement industry is one of the most capital intensive industries: the cost of a new cement plant can be equivalent to about 3 years of revenue. Modern cement plants have capacities well in excess of one million tons per year. Facilities once built may last for 50 years.

State of the art facilities
There are few companies that manufacture and supply equipment for cement plants, and they are constantly improving and updating their designs to meet new environmental and efficiency criteria.

An energy intensive process
It requires the equivalent of 60 to 130 kilograms of fuel oil and 110 kWh of electricity to produce one ton of cement (depending on the cement variety and the process used).

Low labor intensity
Modern cement plants are highly automated. A large plant can be staffed by less than 200 people.

A homogenous product
Cement is a global commodity, manufactured at thousands of local plants. There are only a few types of cement, and products from different producers can generally be substituted for each other. This makes price the most important sale parameter - quality premiums exist but they are limited.

A low cost and heavy product
Because of its weight, cement supply via land transportation is expensive, and generally limited to an area within about 300 km of any one plant site. It is cheaper per ton to cross the Atlantic Ocean with 35,000 tons of cargo than to truck cement 300 km.

A market closely linked to the economic cycle
Consumption of cement is driven primarily by activity in the construction industry, and so is closely linked to the economic cycle. In many developed countries, market growth is slow or nil. In developing markets, growth rates are more rapid, and a large fraction is sold as a bagged product to individual customers. China is the fastest growing market today.

A mixture of local and global companies

The industry is consolidating globally, but large, international firms still account for less than one-third of the worldwide production. Many smaller firms remain in the ownership of their founder families. Some national industries are primarily state-owned, such as China's.

A low public profile

The cement industry does not attract a great deal of public attention as its products are generally consumed as part of concrete or mortar, and it is not a large employer at a national level. Individual plants and quarries may have significant local impacts, however, making strong relationships with local communities important.

A significant role in the climate change debate

The cement industry produces 5% of global man-made CO_2, a major gas contributing to climate change.

A modern industry in the developing world

Plants in the developing world, where the industry continues to expand and develop new sites, may be cleaner and more efficient than those in the developed world which were built 10, 20 or even 30 years

The developed and the developing markets are quite different

The Cement Sustainability Initiative

The Cement Sustainability Initiative is the joint contribution of ten major cement companies, working with WBCSD, to sustainable development. Each of us has a long track record of commitment to environmental and social responsibility, but recognizes the need to work together to tackle barriers and challenges to positive change that affect the industry as a whole.

As this Agenda for Action goes to press, the initiative is three years old. During the past three years it has overseen a major program of scoping, research and stakeholder consultation. The Agenda for Action marks a milestone in that process, as it makes public our conclusions following the research, and sets out our joint program of work over the next five years, which we encourage other companies to join us in.

Of course, things have not stood still during the last three years. Joint projects - such as the development of the Carbon Dioxide (CO_2) Protocol for the cement industry (see page 20 and www.ghgprotocol.org) - have already been initiated and completed, and we have all continued to drive forward with our individual company strategies.

Purpose of the initiative

- Explore what sustainable development means for these ten companies and the cement industry.
- Identify and facilitate actions that companies can take as a group and individually to accelerate the move toward sustainable development.
- Provide a framework through which other cement companies can become involved.
- Provide a framework for engaging external stakeholders.

November 1999 - May 2000:

Initial scoping study

The initiative began in 1999, when three companies first came together as a group under the auspices of WBCSD as the Working Group Cement (WGC) to explore what sustainable development meant for their industry. They quickly recruited seven others to join them. WBCSD commissioned consultants Arthur D. Little to carry out a 10-week scoping study to identify the issues most relevant to the industry and develop a vision for the future. This then set the framework for a major two-year research program which aimed to assess the current practices of the industry and provide recommendations for cement companies and their stakeholders for the next 20 years.

A vision of the cement industry in 2020

Cement companies have integrated sustainable development into their global operations, are known as leaders in industrial ecology and innovators in carbon dioxide management, are regarded as attractive employers, and have established relationships of trust with the communities in which they operate.

May 2000 to March 2002:

The Battelle Memorial Institute's study

In May 2000, WBCSD commissioned the Battelle Memorial Institute, a major not-for-profit research institute specializing in the technical aspects of environment and sustainable development, to carry out the two-year project sponsored by the industry. The Battelle Institute was chosen in order to guarantee the quality, independence and objectivity of the research and its conclusions. The ten companies gave support and information throughout the project, to ensure the final report would be meaningful to others within the industry. The WBCSD project team participated in all meetings, monitored communications between the Battelle Institute and the companies, and organized a quality assurance process.

To reinforce the independence of the study, an external Assurance Group was set up to review the research and make certain that the work fairly represented multiple viewpoints and the range of issues that needed to be included. This group included:

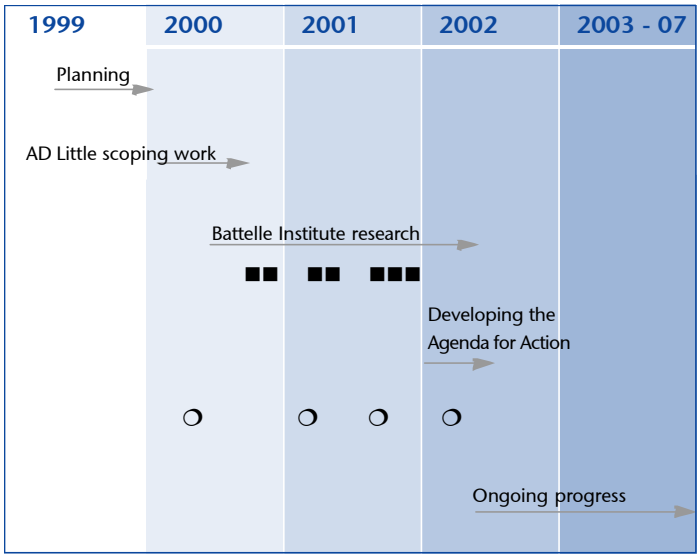
Dr. Mostafa Tolba
Chair. Former Director-General of UNEP

William Reilly
Former Administrator of the US Environmental Protection Agency

Corinne Lepage
Former Environment Minister of France

Professor Victor Urquidi
Past President and Professor Emeritus of Collegio de Mexico

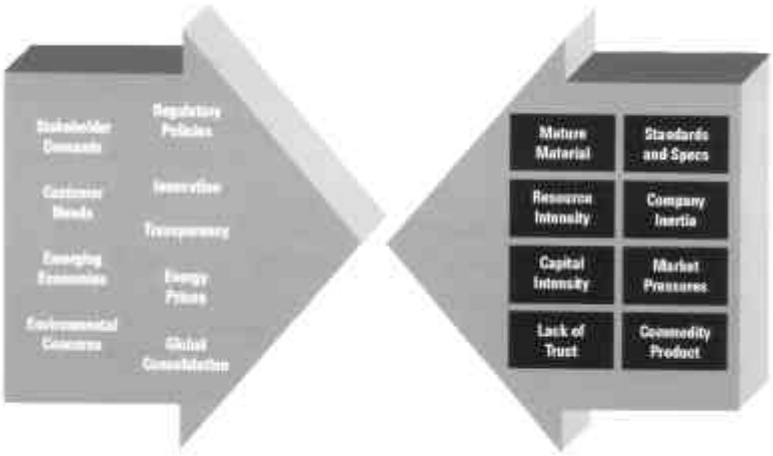
Professor Istvan Lang
Past President of the Hungarian Academy of Sciences



■ Stakeholder meetings: Curitiba, Bangkok, Lisbon, Cairo, Washington, Brussels, Beijing
❍ Assurance Group meetings

The Recommendations

The research project involved experts from industry, academia and NGOs in thirteen separate sub-studies, each of which focused on a different aspect of sustainable development. The sub-studies identified the major opportunities and challenges facing the industry, and suggested potential actions that could be taken up by the industry as a whole or by individual companies, in conjunction with relevant stakeholders.



The external forces pushing cement companies toward sustainable development, and the barriers that may stand in their way.

Battelle Institute recommendations:

Climate protection	Establish corporate carbon management programs, set company-specific and industry-wide medium-term CO_2 reduction targets and initiate long-term process and product innovation.
Resource productivity	Facilitate the practice of industrial ecology and eco-efficiency in the cement industry.
Emissions reduction	Continuously improve and make more widespread use of emissions control techniques.
Employee well-being	Implement programs to enhance worker health, safety and satisfaction.
Community well-being	Contribute to enhancing quality of life through local stakeholder dialogue and community assistance programs.
Ecological stewardship	Improve land-use practices by disseminating and applying best practices for plant site and quarry management.
Regional development	Promote regional economic growth and stability by participating in long-term planning and capacity-building, especially in developing countries.
Business integration of sustainable development	Integrate sustainable development principles into business strategy and practices in order to create shareholder value.
Innovation	Encourage sustainable development-related innovations in product development, process technology, and enterprise management.
Co-operation	Work with other cement companies and external organizations to foster sustainable development practices and remove barriers.

Copies of the Battelle Institute's reports can be found at ***www.wbcsdcement.org***

During 2001: Stakeholder consultation

The initial scoping report identified engaging with stakeholders (other than shareholders and financial institutions) as a key action for the industry as it moves toward sustainability. Therefore, alongside the Battelle Institute's research, a series of seven dialogue sessions were held across the world.

The purpose of these sessions was to listen to the expectations of key stakeholders, and explore what those expectations mean for the future of the industry. The sessions, designed to involve a diverse range of groups with a stake in the industry's future, were held in locations that reflected a variety of markets, economies and industry-stakeholder relations. Four, held in Brazil, Thailand, Portugal and Egypt, were run for local and national government representatives, resident's groups, employees, consumer organizations, suppliers and NGOs. Two, held in Washington DC and Brussels, were aimed at global environmental interest groups, policy-making bodies and multi-lateral financial and development organizations. The final session, in China, was a workshop held with representatives of the Chinese cement industry, local governments and several NGOs.

The sessions produced three particularly interesting findings:

1. **Stakeholders across the globe perceive that, in common with other heavy industries, the cement industry has engaged in only a limited way with local communities. These communities feel there are environmental and social issues that still need to be addressed.**

2. **There are particular contrasts in the needs and aspirations of communities between developed and developing countries.**
   - **In the mature markets of Europe and North America, cement plants are often seen as a necessary intrusion, and environmental issues such as dust, noise, use of alternative fuels and local pollution are of most concern to stakeholders.**
   - **In the emerging markets of Latin America, Africa and South East Asia, cement plants are seen as signs of economic development, and while people have the same rights to a clean and healthy environment, dealing with social issues (such as housing, health and education) through local community engagement is key to meeting local expectations.**

3. **Almost all groups cited climate change as a major concern for the cement industry.**

Our agenda for action

Priorities

We have identified six key areas where we believe that the Cement Sustainability Initiative can make a significant contribution to achieving a more sustainable society, and where there are significant environmental and social benefits to be gained through collaborative action.

The six areas are:

- Climate protection
- Fuels and raw materials
- Employee health and safety
- Emissions reduction
- Local impacts
- Internal business processes

These form the basis of this Agenda for Action, which sets out the work program for the Cement Sustainability Initiative over the next five years. The sixth area of work addresses internal business processes that run through the other five areas - effective management systems, stakeholder engagement and reporting.

Joint projects and individual company actions

For each of these six areas, there are both joint projects and individual actions.

The joint projects will involve several companies working together to tackle a specific project, often in conjunction with stakeholders, for example, the production of guidelines. Participation in them will be voluntary. The individual actions will be implemented by companies independently within their operations. These would include, for example, using the guidelines developed as part of the joint projects to help set and report individual company targets.

Joint activities individual responsibility

While joint action is at the heart of the work program, individual companies take responsibility for carrying out their commitments. The details of strategy, timing and reporting will vary between companies, reflecting differences in business systems, cultures, and social settings. Companies are of course responsible for ensuring that any action they take is in compliance with local regulations.

Involving third parties

The work so far has emphasized the fact that the industry cannot work in isolation on these issues. One of the central principles of the Cement Sustainability Initiative is therefore to engage relevant third parties in all aspects of its work. As the Agenda for Action sets out, many of the joint projects will engage interested parties, such as Trade Associations, NGOs and government representatives, in the development of industry-wide guidelines and protocols. Individual companies are responsible for any third party engagement in their implementation of the individual actions.

Summary of the Agenda for Action

Joint projects	Individual company actions
The Cement Sustainability Initiative intends to create joint projects to:	*As part of our ongoing commitment to good practice and innovation in sustainable development, companies agree to:*
Climate protection	
▪ develop a Carbon Dioxide (CO_2) Protocol for the cement industry. (Project already delivered.) ▪ work with WBCSD/World Resources Institute (WRI) and other organizations to investigate public policy and market mechanisms for reducing CO_2 emissions.	▪ use the tools set out in the CO_2 protocol to define and make public their baseline emissions. ▪ develop a climate change mitigation strategy, and publish targets and progress by 2006. ▪ report annually on CO_2 emissions in line with the protocol.
Fuels and raw materials	
▪ develop a set of guidelines for the responsible use of conventional and alternative fuels and raw materials in cement kilns.	▪ apply the guidelines developed for fuel and raw material use.
Employee health and safety	
▪ set up a Health and Safety Task Force. (Project already delivered.) ▪ establish a Health and Safety information exchange.	▪ respond to the recommendations of the Health and Safety Task Force on systems, measurement and public reporting.
Emissions reduction	
▪ develop an industry protocol for measurement, monitoring and reporting of emissions, and find solutions to more readily assess emissions of substances such as dioxins and volatile organic compounds.	▪ apply the protocol for measurement, monitoring and reporting of emissions. ▪ make emissions data publicly available and accessible to stakeholders by 2006. ▪ set emissions targets on relevant materials and report publicly on progress.
Local impacts	
▪ develop guidelines for an Environmental and Social Impact Assessment (ESIA) process which can be used at all cement plant sites and associated quarries.	▪ apply the ESIA guidelines, and develop tools to integrate them into decision making processes. ▪ draw up rehabilitation plans for their operating quarries and plant sites, and communicate them to local stakeholders by 2006.
Internal business processes	
▪ investigate methods to track the performance of the cement industry, including development and use of key performance indicators. ▪ produce a full progress report after 5 years, and an interim report after 3 years.	▪ integrate sustainable development programs into existing management, monitoring and reporting systems. ▪ publish a statement of business ethics by 2006. ▪ establish a systematic dialogue process with stakeholders to understand and address their expectations. ▪ report progress on developing stakeholder engagement programs. ▪ develop documented and auditable environmental management systems at all plants.

'The cement industry could be a very significant participant in the Climate Leader's partnership as they work to implement sustainable development'.

government participant, Washington DC dialogue

Changing climate conditions are affecting many things, including the life of the muskox in the Canadian Arctic.

Climate protection

Cement manufacture is an energy intensive process. Consuming energy from fossil fuels such as oil and coal creates carbon dioxide (CO_2), the most important Greenhouse Gas (GHG) causing climate change. CO_2 was approximately 69% of the total emissions of green-house gases on a weight basis in 1990. In addition, the chemical process of making clinker produces CO_2. These two factors mean that the cement industry produces 5% of global man-made CO_2 emissions, of which 50% is from the chemical process, and 40% from burning fuel. The remainder is split between electricity and transport uses. In response to international concerns about climate change, governments across the world are considering and imposing taxes on industry energy use and GHG emissions (for example, the UK's Climate Change Levy). Climate protection, and in particular reduction of CO_2 emissions, is therefore an issue which we take very seriously.

The first step in reducing GHG emissions is to establish a universal framework for measuring and reporting those emissions. This allows companies to set meaningful targets for reduction, understand their costs, and monitor progress. We therefore chose to work with WBCSD and the World Resources Institute to develop a uniform CO_2 protocol as part of their GHG Protocol Initiative (www.ghgprotocol.org).

The protocol is intended as a tool for any cement company worldwide. It establishes a common approach to monitoring and reporting all direct and indirect CO_2 emissions from the cement manufacturing process in absolute (tons of CO_2 per year) and specific, unit-based (kg of CO_2 per ton of cementitious product) terms. It also enables us to establish baseline emissions against which we can measure and report progress.

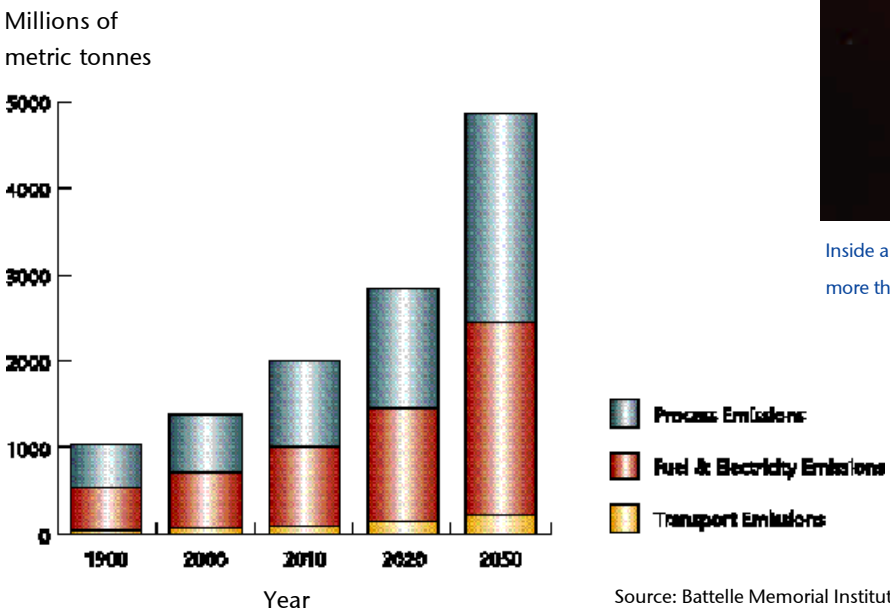
The protocol does not set industry-wide targets for CO_2 or other GHG reductions. It is the task of individual companies to set and publish their own targets, and to choose the most appropriate strategy for achieving them. Because climate protection has such a high profile in the industry, effective strategies for managing CO_2 emissions are of crucial importance in the marketplace. The reduction options are likely to include: innovation in improving the energy efficiency of processes and equipment; switching to lower carbon fuels; using alternative raw materials to reduce limestone use; developing CO_2 capture and sequestration techniques; and taking advantage of market mechanisms such as emissions trading and voluntary initiatives.

Having put the protocol in place, the next task of the Cement Sustainability Initiative will be to engage with key stakeholders to investigate how market mechanisms and public policy can be used to encourage and enable companies to make meaningful reductions in CO_2 emissions.

Inside a cement kiln, where temperatures reach more than 1400°C (2550°F).

Projected CO_2 emissions from the global cement industry through 2050

(assuming no change in current practices)



Source: Battelle Memorial Institute

What we are going to do

Joint projects

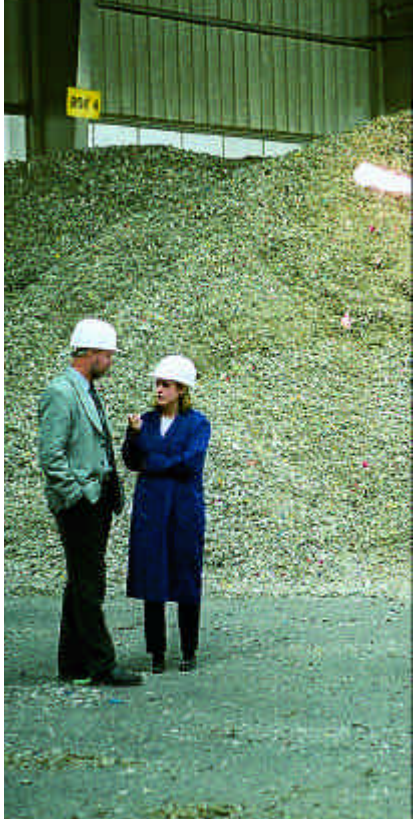
- We will work with relevant stakeholders to develop a Carbon Dioxide Protocol for the cement industry. (Commitment already delivered in parallel with the Battelle Institute's study).
- We will work with competent authorities, WBCSD/WRI and other organizations to investigate public policy and market mechanisms for making meaningful reductions in CO_2 emissions in the most effective way.

Individual actions

- Each company will use the tools set out in the CO_2 protocol to define and make public their baseline emissions by 2006.
- Each company will develop a climate change mitigation strategy, and by 2006 will publish targets and progress.
- As a result of implementing the CO_2 protocol, each company will report annually on:
  - Total gross and net CO_2 emissions as tons CO_2 (as defined in the protocol www.wbcsdcement.org/sub_C02.asp)
  - Amount of CO_2 emitted for every ton of cementitious product (kg CO_2 per ton of product)
  - Changes in the amount of CO_2 emitted compared to a 1990 baseline (tons CO_2)

'The idea of using cement factories to serve society by dealing with oil, slag and other natural waste is certainly a good thing that we should share with other countries'.

participant, Chinese cement workshop, Beijing



Shredded plastic and paper is used as an alternative fuel.

Fuels and raw materials

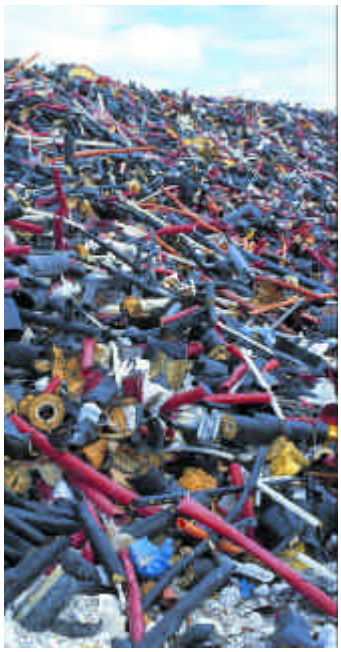
Almost all industries know that in order to continue to meet the demands of a growing world population, they must become smarter in the way they use, re-use and recycle raw material, energy and waste in the economy.

Using waste from other industries as raw material is a huge opportunity for the cement industry to reduce its environmental impact, because it allows companies to access materials for use in the kiln and the mill without extracting them directly from the ground. There are a number of mineral by-products produced by the mining and power generation industries that contain useful materials that can be extracted for use in cement production, or in making concrete. For some waste streams this has already been achieved, but for others, economically viable extraction methods have still to be developed. Individual cement companies are already working on these, and there is much competitive advantage to be gained by being the first to market with a solution.

Other kinds of wastes from domestic, industrial or agricultural sources may have little useful mineral content, but can be used as fuel in place of (or alongside) traditional fossil fuels. Using these wastes is a key service that cement companies can provide to society. As well as reducing the amount of fossil fuel needed to produce cement, it prevents large volumes of material from going to landfill or being burned in incinerators.

While many waste streams are suitable for use as alternative fuels or raw materials, there are some that are not. For public health and safety reasons, no cement plant would be willing to burn nuclear or medical waste, or materials that could compromise the performance of the product. Individual companies are responsible for developing polices on the types of wastes and management practices to be used at individual facilities. Many companies already have guidelines on what materials can be used, and under what conditions, although the content of the guidelines and the materials they refer to varies from company to company and is generally not a matter of public record.

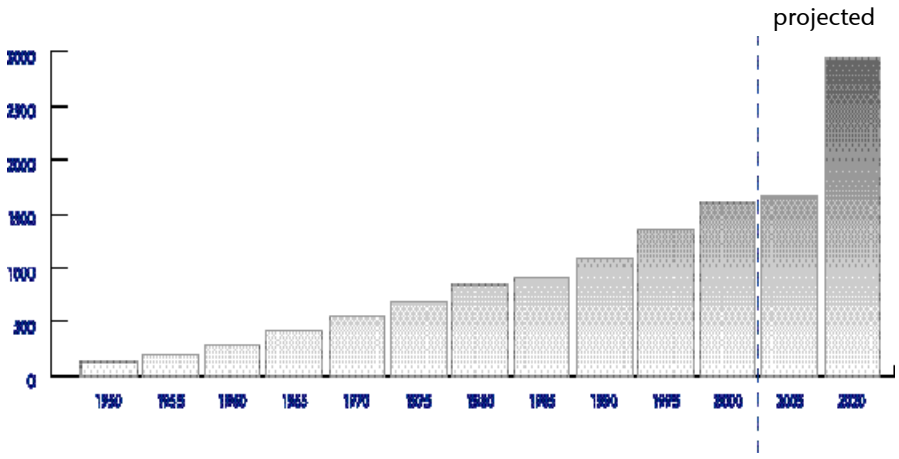
This complex picture has created concern and uncertainty among many stakeholder groups about the contribution that the cement industry can make in helping to solve society's and industry's waste problems. There are undoubted business benefits to be gained from using waste materials. But we will only use them where it can be done safely, without harm to our employees, neighbors and the environment. The Cement Sustainability Initiative therefore intends to begin an open, constructive dialogue to investigate the risks and benefits associated with the use of waste materials in cement kilns, including issues such as health and safety, economics, emissions and public concerns about using waste materials. We hope that this will lead to the creation of agreed guidelines that can be used by companies across the world.



Used plastic insulation to be used as an alternative fuel.

Global cement production

millions of metric tonnes annually



Rising cement demand will increase the need for fuels and raw materials.

Source: Battelle Memorial Institute estimates

What we are going to do

Joint project

- We will develop a set of guidelines for the responsible use of conventional and alternative fuels and raw materials in cement kilns, engaging relevant stakeholders in the process.

Individual action

- Each company will apply the guidelines for the responsible use of conventional and alternative fuels and raw materials in their operations.

Employee health and safety

Ensuring healthy and safe working conditions for employees and contractors is one of the most important issues for the cement industry. We recognize that more attention should be paid to this area across the whole industry and we are committed to playing a full part in that process. A Health and Safety Task Force has already begun to meet and discuss options for future work, and will be central to delivering the Initiative's projects and commitments.

While systems for reporting on individual company occupation-related illness and injury rates do exist, in most cases we are not currently able to report industry-wide figures. The Battelle Institute's research correctly points out that public information in this area is hard to come by. From what we do know, we believe that the accident and injury rate in our industry is higher than others such as petrochemicals and petroleum refining. We regard this as unacceptable and believe that it is affecting the reputation of the cement industry as a whole. That is why we are asking the Task Force to first develop standard, cross-company systems to measure, monitor and report on health and safety performance, which individual companies can then implement.

The design of buildings and equipment for safe operation obviously has a role to play in reducing accidents and incidents, and the companies supplying equipment to the industry are constantly improving and refining their products so that they meet the highest safety standards. However, in reality, regular effective health and safety training and a culture of safety are the most powerful tools to reduce injury and occupation-related illness rates. All the companies involved in this project have health and safety programs in place, and the Task Force will be establishing an information exchange for companies to share their experience, identify common causes of injuries and develop recommendations for continuous improvement.

Accident rates are not currently reported in a common format around the world, making performance comparisons difficult. For example:

Company	Home Country	Year	Format
Siam Cement	Thailand	2000	Lost working days per 200,000 man-hours
Cemex (Cement sector)	Mexico	2000	Lost working days per 100 employees
Lafarge (Cement business)	France	2000	Lost working days per 1,000,000 working hours

What we are going to do

Joint projects

- We will accelerate action through a Health and Safety Task Force (already set up in parallel with the Battelle Institute's study), to ensure delivery of effective systems of measuring, monitoring and reporting on health and safety performance.
- The Task Force will:
  - develop an information exchange including information on the rates, origins and types of accidents and incidents that occur
  - share company experience
  - develop recommendations for prevention.

Individual actions

- Each company will respond to the recommendations of the Health and Safety Task Force by:
  - improving existing systems, procedures and training for tracking, following up and preventing accidents and incidents.
  - measuring and reporting publicly on performance in a common format.

'In China, 10-12 million tons of dust were released by the cement industry in 2000. That quantity of dust is equivalent to the product of 8 production lines with 4,000 tons per day capacity'.
participant, Chinese cement workshop, Beijing

Emissions reduction

In common with most manufacturing industries, many of our emissions are carefully monitored and reported in order to comply with environmental regulations on emissions limits. As an industry, we need to co-operate proactively with regulators to ensure that these limits are both reasonable and effective. However, we believe it is necessary to look beyond legal compliance and reassure our stakeholders that we are managing our emissions responsibly.

Almost all manufacturing activity results in emissions to the atmosphere, and cement manufacture is no exception to this. Many of the gases released are harmless. However, some are either known or suspected to cause damage to the environment. For example, sulfur compounds (referred to as SOx) can combine with water and other substances in the atmosphere to form 'acid rain', which causes damage to lung tissue, forests and buildings. Volatile organic compounds and nitrogen oxides (NOx) are responsible for the local, low level pollution usually called smog, which also contains small particles that can cause respiratory problems. There are also others which may raise health concerns if their levels are not carefully monitored and controlled. Dust and other particulates are obvious examples of this.

It is clear that some stakeholders feel that existing emissions regulations are not strong enough, and that most want clear information on the nature of our emissions, their impacts, and what we are doing about them. Individual companies are able to provide this information, but the variation in measurement and reporting systems across the world means that currently data is not comparable between companies and between countries. We have therefore concluded that one of the priorities for the Cement Sustainability Initiative is to work with relevant stakeholders and experts to develop a common protocol for monitoring of emissions, and a standard format for reporting data.

'The industry needs [to identify and] respond to specific measures and targets'.

NGO representative, Brussels dialogue

The first task of the project team will be to establish a priority list of substances to be included in the first round of the protocol. We expect that this list will include the three atmospheric emissions identified as a key concern during the dialogues: NOx, SOx, and dust or particulates. By setting common standards for monitoring and reporting these emissions, the protocol will enable transparency and reporting on performance, which will keep stakeholders informed of our progress. It will also have the effect of stimulating pressure to reduce emissions. It is the task of individual companies to develop meaningful emissions targets and reporting processes, but as local and international concerns about environmental pollution continue to remain in the public eye, these targets will have an important impact on each company's business.

Two substances in particular will require special attention. For VOCs and dioxins, research into effective and meaningful methods for measuring and monitoring emissions is needed before a global protocol can be discussed. Once this is done, we would expect both to be included in a future round of the protocol.

What we are going to do

Joint projects

- We will develop an industry protocol for measurement, monitoring and reporting of emissions such as:
  - NOx
  - SOx
  - Dust/particulates
- We will also find solutions to better assess emissions of other substances such as dioxins and VOCs.
- We will consult with external stakeholders on both projects, and subject the protocol to external validation.

Individual actions

- Each company will apply the industry protocol for measurement, monitoring and reporting of emissions once it has been developed and validated.
- Each company will make emissions data publicly available and accessible to stakeholders.
- By 2006 each company will set emissions targets on relevant materials and report publicly on progress relative to those targets.

'I am particularly concerned with the loss of our mountain, which was a treasured part of the landscape'.
community activist, Bangkok dialogue

Top: Quarry during operation.

Bottom: Quarry during rehabilitation.

Local impacts

Cement companies have a significant impact on the communities where they operate. The quarries and plants associated with cement production are major features of the local landscape and economy. The way companies evaluate and manage the social and economic impacts of siting, acquisition and closure of sites affects the quality of life of the communities involved, and our reputation as an industry. Maintaining our 'license to operate' as an industry is dependent on being able to earn and keep the support and trust of local people and this includes treating their environment with respect.

The most useful tool for understanding and managing the impacts of a particular site is a careful and thorough Environmental and Social Impact Assessment. Through scientific analysis and stakeholder engagement, this assessment process helps a company identify the critical environmental and social issues associated with a site, and develop effective options for dealing with them. Because of the large amount of capital funding involved in developing or altering a site, it is cost effective to carry out such an assessment prior to site development, to identify and resolve issues at an early stage. Assessments can also be useful during operation to identify areas for improvement, or before site closure to assess options for rehabilitation.

We already carry out Environmental Impact Assessments at many sites prior to development, although their content and scope varies. Social Impact Assessment is less well recognized and understood. It is carried out during some projects, at the request of funding bodies such as the European Bank for Reconstruction and Development and the World Bank, and in some countries as part of existing processes. Elsewhere socio-economic impacts are generally not assessed. We believe that our companies would benefit from a set of guidelines on an Environmental and Social Impact Assessment (ESIA) process that includes close engagement with local stakeholders. We intend to work with key stakeholders to develop guidelines that could then be applied at all cement plant sites and associated quarries, and for all new projects, site acquisition and development, and closures.

'Communities around cement plants have high expectations of support from the plants'.
community activist, Bangkok dialogue

Understanding the needs and expectations of local stakeholders is a fundamental first step in working effectively with local communities. But there are no firm rules. Different communities have very different priorities and expectations. Each, quite rightly, expects to be dealt with on an individual basis. Our experience is therefore that community issues are almost always dealt with most effectively at each site. There are some excellent examples of community engagement and social investment programs around our plant and quarry sites, but almost all could benefit from improved communications. Key members of staff have gained valuable experience, but we know that there is a need for capacity building to provide staff with new and additional skills in community engagement. As part of the Battelle Institute study, a communication and stakeholder involvement guidebook for cement facilities was developed and published, which we plan to take full advantage of.

The cement industry has long recognized its responsibility for rehabilitation of quarry and plant sites following closure. We believe that individual companies must look at sites on a case-by-case basis to assess their potential environmental, social and economic value to the local community. It is our experience that plans for rehabilitation are most effective where they are drawn up in conjunction with relevant local stakeholders, and as early as possible in the site development process. For quarries, this process can start almost before opening, as the options for rehabilitation may be limited by local geography, public interests and climate. The plans then need to be reviewed periodically to keep pace with changing expectations, economic conditions and good practice. For cement plant sites, however, it is almost impossible to plan ahead for rehabilitation, as the land use possibilities change considerably over time. Plans for plant sites therefore need to be developed once a closure date draws near.

What we are going to do

Joint projects

- We will work with interested stakeholders to develop guidelines on an Environmental and Social Impact Assessment (ESIA) process which can be used at all cement plant sites and associated quarries, and for all new projects, site acquisition and development, and closures. The guidelines will be subject to external validation.

Individual actions

- Each company will apply the ESIA guidelines once they are developed and validated, and will develop tools to integrate them into their decision making processes for site development and management.
- By 2006, each company will have rehabilitation plans for its existing operating quarries. Where operating quarries are newly acquired, plans will be developed within 3 years of acquisition. The plans will be communicated to local stakeholders, and will be regularly reviewed and updated.
- Each company will draw up rehabilitation plans for specific cement plant sites once closure timing is known. These will be communicated to local stakeholders.

'The cement industry is very important to our economy'.

public interest group representative, Cairo dialogue

Internal business processes

We firmly believe that integrating sustainable development principles and goals into our companies and our industry will create long-term shareholder value and benefit our stakeholders. The Cement Sustainability Initiative intends to encourage this integration in three spheres: in internal systems and processes, in business partnerships and in our relationships with civil society.

Integrating sustainable development principles into business systems

Achieving a more sustainable society will require sustainable development principles to be reflected in all business decisions and activities. Each company will continue to develop its own management systems and incentive processes for managing this integration. These will be unique to the company's culture, internal systems, markets and stakeholder expectations. They will include training programs to help employees in each company to understand and explore what the corporate commitment to sustainability means for them in their day-to-day role.

Key performance indicators and targets can help to drive change if they are thoughtfully developed and designed, because they enable internal and external stakeholders to measure and assess performance. That is why we have decided to work together to develop meaningful indicators which will help us to track our progress on sustainable development as a group and as individual companies.

Most cement companies already have environmental management systems in place at some or most plants to measure and monitor environmental performance. Because most of our environmental impacts can only be managed effectively on a site-by-site basis, these systems are the best way to ensure continuous improvement. All companies have therefore agreed to work toward having fully documented and auditable systems in place at all plants.

Investors, governments and others need reassurance that our business practices and ethical standards are robust and consistent from region to region, regardless of local circumstances. We believe that our companies are upholding this principle, but would benefit from the publication of written statements of business ethics setting out the principles that all parts of the business are expected to uphold in areas such as stakeholder engagement, environmental standards and human rights. Many such statements already exist, and WBCSD is currently evaluating the effectiveness of existing statements from multi-national companies in other sectors and international principles such as the Sullivan Principles [www.globalsullivanprinciples.org]. Its conclusions will provide a useful starting point for companies.

Relationships with business partners

In our relationships with other businesses, taking advantage of 'systems gains' such as re-use of waste has already begun (see 'Fuels and raw materials', page 22).

By working closely with our suppliers, customers and other industry sectors we can create more of the kinds of interactive systems that are needed to maximize global resource efficiency and improve our own performance.

Relationships with civil society

We cannot make our contribution to a sustainable society by acting alone. We must continually listen to and work with others to remove barriers to achieving sustainable development in the industry. This is particularly important in our relationships with governments, where the principles of sustainable development give us a common starting point for reviewing existing regulatory frameworks and identifying where they act as a barrier to positive change.

The Cement Sustainability Initiative has placed a great deal of emphasis on the importance of engaging with stakeholders. Historically, the cement industry has been reasonably effective in developing good relationships with local communities, but has been less effective in creating strong relationships with national or global stakeholder groups. All these groups are essential in helping us to understand the issues we face, and how our industry can make a truly significant contribution. All the joint projects undertaken by the Initiative will engage relevant stakeholders. As individual companies, we are also committed to creating more systematic ways of engaging and communicating with all stakeholder groups, and reporting our progress.

'There is a need for earlier and more effective public involvement by the industry'.
NGO participant, Lisbon dialogue

What we are going to do

Joint projects

- We will investigate how we can track the performance of the cement industry on sustainable development including development and use of key performance indicators for sustainable development goals and processes.
- We will produce a full progress report after 5 years. We will also produce an interim report in 3 years.

Individual actions

- Each company will integrate sustainable development programs into existing management, monitoring and reporting systems. This will include defining management responsibilities, setting key performance indicators and targets, establishing internal sustainable development awareness programs and communicating on programs and targets internally and publicly.
- Each company will develop documented and auditable environmental management systems at all plants, where these do not already exist.
- Each company will publish a statement of its business ethics by 2006. This will include reference to the company's approach to social responsibility.
- Each company will establish a systematic dialogue process with stakeholders to understand and address their expectations. This will form part of local planning and community assistance programs.
- Each company will report on their progress in developing stakeholder engagement programs, and will report progress on key issues to relevant stakeholders.

Reporting on progress

To create the maximum value from our activities, we need to communicate what we are doing to our stakeholders and to our shareholders. Individual companies will develop strategies for communicating their own progress, and for providing individual stakeholder groups with information on the issues that concern them. As a group we will publish an interim report on our progress in three years' time, in preparation for a full progress report after five years.

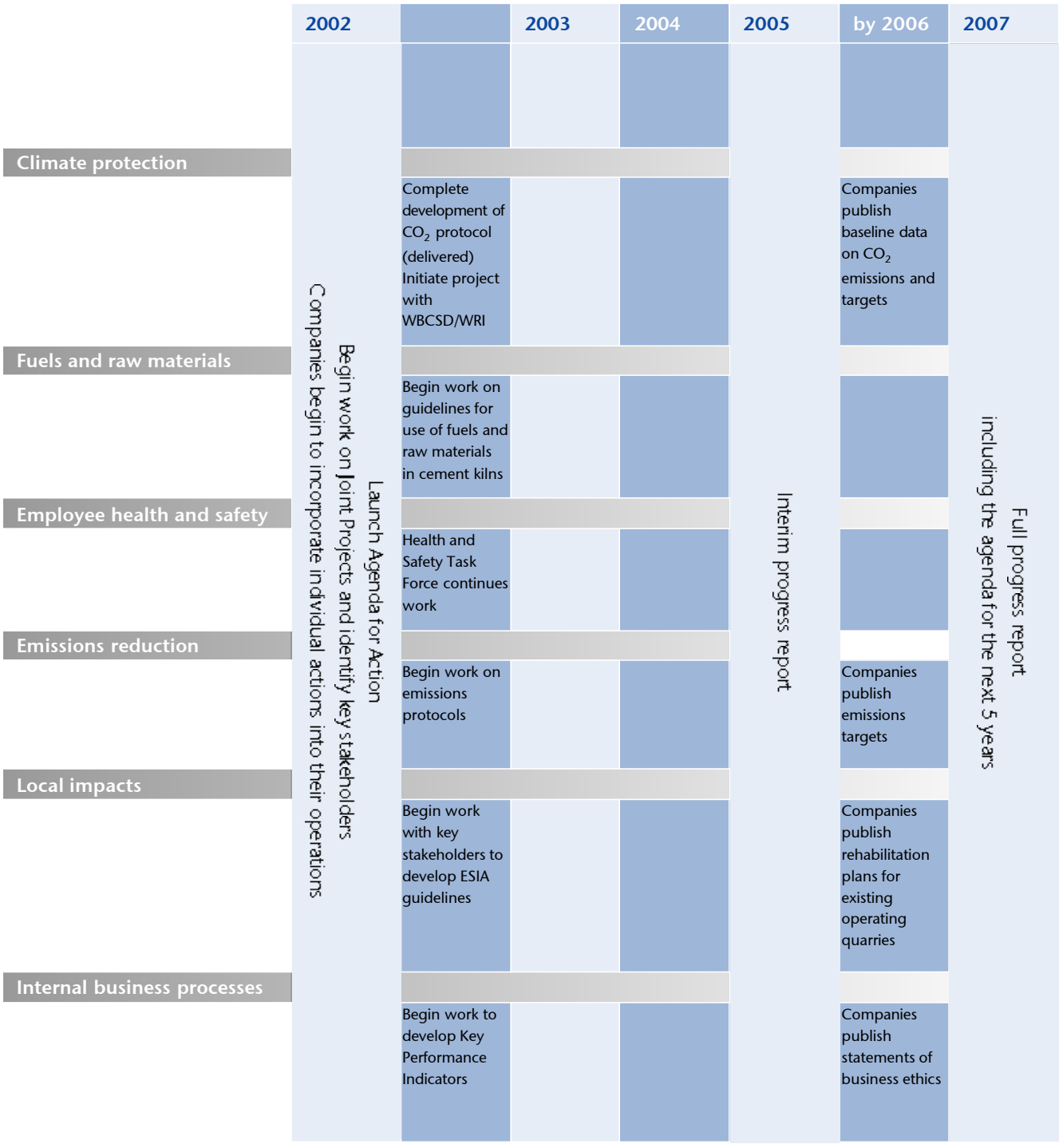
The need for innovation and technology transfer

Any industry that does not innovate in response to changing social trends and markets will soon find itself obsolete. Radical solutions will be needed to bring about the kinds of step changes needed to create a more sustainable future. Not all of these will be technical advances in equipment or product formulation. There is also a need for innovation in techniques for engaging local communities, in empowering and developing employees, and in marketing and using our products.

Technology transfer between countries and individual sites is a vital part of this process. The cement industry is unusual in that new technology tends to be deployed in the expanding markets of the developing world as new plants are built. This means that while technology is transferred from the developed to the developing world, the understanding and experience of how to operate and manage it effectively is transferred in the opposite direction. Global expansion by companies is accelerating this trend.

Delivering the Agenda

The Cement Sustainability Initiative has set itself a number of key milestones over the next five years which punctuate the ongoing work on the joint projects and the individual company actions. We invite other companies and external stakeholders to join us at any stage of this program. These projects are in a very early scoping stage now, but clear timeframes will be established as partners are engaged and the workplans for each developed.



A role for many: an invitation to engage

The process of establishing a vision and recommendations for the industry, and developing meaningful commitments in response to those recommendations, has involved internal reflection in the industry and external consultation with stakeholders across the globe. In many cases these external consultations were both challenging and instructive, revealing perceptions and expectations of the industry that we had not previously appreciated.

Stakeholder engagement is a process rather than an end state. There is much to do as we move down the path toward sustainable development, and we are more concerned than ever that all those with an interest in the economic, environmental or social performance and impacts of the cement industry are able to make their views heard. Achieving more sustainable performance will require all of us to tackle difficult problems and make choices between competing alternatives and outcomes. These are seldom simple choices, and most cannot be made by the industry acting in isolation. Many will require engagement with civil society.

Please accept our invitation to join with us as we take the next steps on our journey. Individual companies will develop their own stakeholder engagement and dialogue processes, and contact names for each company can be found on page 35. The Cement Sustainability Initiative will be the main forum for outside parties to input their ideas, thoughts and expectations into the joint projects. We will be holding a series of stakeholder dialogues in the future. If you would like to be kept informed of these please send your contact details and areas of interest to:

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Contacts and further information

Copies of all the project documents are available on the project web site, **www.wbcsdcement.org.** Printed copies of the Agenda for Action and the Battelle Institute's Summary Report may be ordered from:

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If you are interested in learning more about the Cement Sustainability Initiative, please contact the World Business Council for Sustainable Development at the address below. For information about individual companies' roles in the initiative, please contact the company contacts as indicated.

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Moving toward a more sustainable future is partially about learning to work together, across national and international boundaries. We would like to thank the many, many people who have contributed to the Cement Sustainability Initiative during the past three years. People have given generously of their time, contributed new perspectives, helped us to better understand how our industry fits into contemporary society, and helped us to see what the future may hold.

We acknowledge the generous support of our sponsors, the hard work of A.D. Little, the Battelle Memorial Institute and their subcontractors, and the activities of our communications partners. We also acknowledge the opportunities to meet and work with our stakeholders. We have learned much from them, and from many other people who have contributed to our work. Recognizing that we have met many people during this three-year period, we apologize in advance for those names which may be missing in the list which follows.

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About the WBCSD

The World Business Council for Sustainable Development (WBCSD) is a coalition of 160 international companies united by a shared commitment to sustainable development via the three pillars of economic growth, ecological balance and social progress. Our members are drawn from more than 30 countries and 20 major industrial sectors. We also benefit from a Global Network of 38 national and regional business councils and partner organizations involving more than 1,000 business leaders globally.

Our mission

To provide business leadership as a catalyst for change toward sustainable development, and to promote the role of eco-efficiency, innovation and corporate social responsibility.

Our aims

Our objectives and strategic directions, based on this dedication, include:

Business leadership - to be the leading business advocate on issues connected with sustainable development.

Policy development - to participate in policy development in order to create a framework that allows business to contribute effectively to sustainable development.

Best practice - to demonstrate business progress in environmental and resource management and corporate social responsibility and to share leading-edge practices among our members.

Global outreach - to contribute to a sustainable future for developing nations and nations in transition.

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