



# SUSTAIN ABILITY

11<sup>th</sup> REPORT 2011



bringing materials to *life*™

# Lafarge's presence in the world

World leader in building materials, Lafarge holds top-ranking positions in each of its business lines. With a diversified and balanced geographic portfolio and 68,000 employees in 64 countries, Lafarge is at the heart of global growth, supporting developing economies and responding to the tremendous need for housing and infrastructure in emerging countries.

## Cement

### Worldwide market position:

World Leader - Cement, hydraulic binders and lime for construction, renovation and public works

**Employees:** 43,392

**Revenues:** 9,975 million euros

**Countries:** 58

**Number of plants:** 166

## Aggregates & Concrete

### Worldwide market position:

N°2 for Aggregates and N°4 for Concrete - Ready-mix and precast concrete products, asphalt and paving for engineering structures, roads and buildings

**Employees:** 23,242

**Revenues:** 5,227 million euros

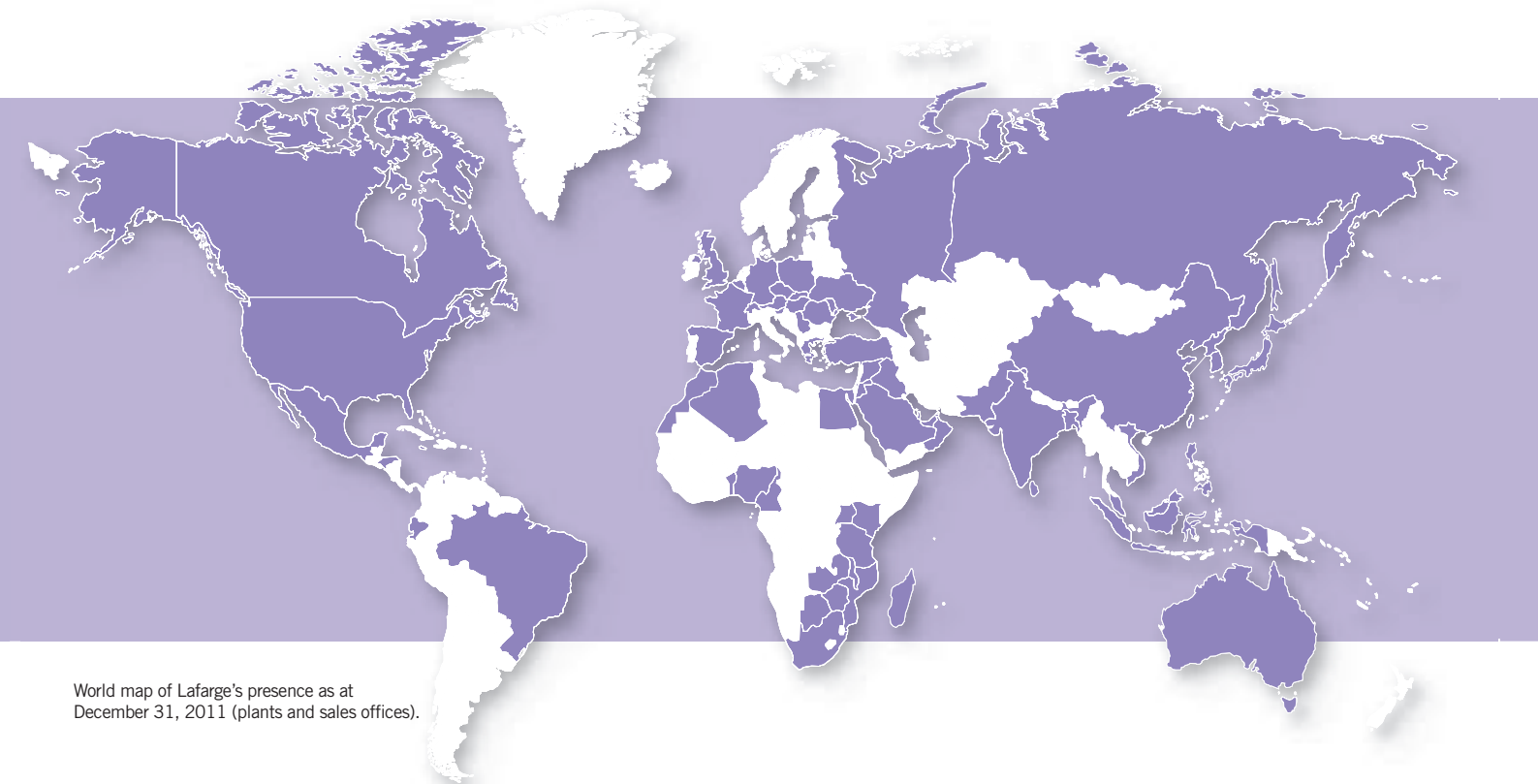
**Countries:** 35

**Number of plants and quarries:** 1,438

## Other

**Employees:** 1,289

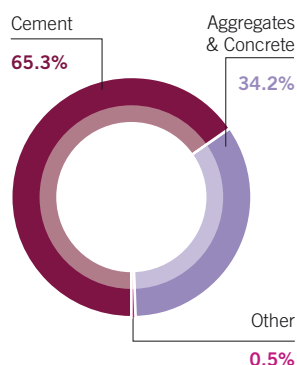
**Revenues:** 82 million euros



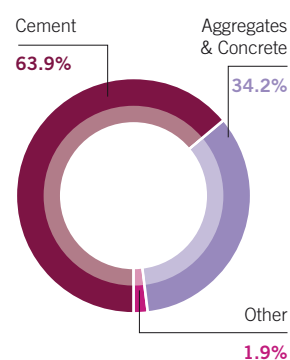
**15,284**  
REVENUES  
(IN MILLION EUROS)

**736**  
NET INCOME  
(IN MILLION EUROS)

### GROUP REVENUES BY DIVISION



### GROUP EMPLOYEES BY DIVISION



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# The year at a glance

## Values and Governance

The Code of Business Conduct sets the standards of behavior for all employees and executives of the Group as well as for suppliers of goods and services. The Group also set up a Competition Compliance Program. It includes awareness building and training for employees and verification at business unit level (96% of them were tested at the end of 2011). The Board of Directors is composed of 17 members, 10 of whom are independent, including three women. Finally we recognize the UN Declaration on the Rights of Indigenous People, the OECD Principles of Corporate Governance, and the UN Global Compact.

See pages 6 to 8.

## Public positions

We are committed to responsible lobbying based on transparency, stakeholder dialogue and in coherence with the Group's strategy and values; to ensure that the Group's long-term interests are taken into account by public authorities. In 2011, our lobbying actions within the European Union focused primarily on climate change, energy efficiency and resource efficiency issues.

See pages 9 to 11.

## People development and social dialogue

Diversity and Inclusion is a key enabler of the Group strategy and is based on 3 main levers: Behaviors and mindset, communication & awareness and business and HR processes. Another key element of our social strategy is employee ownership; our 2011 LEA share ownership plan reached a subscription rate of 44%, versus 53% in 2009. Moreover, we endeavored to limit or postpone headcount reductions, and to assist every affected employee as prescribed in our Employment Policy.

See pages 21 to 29.

## Health and Safety

Lafarge's objective is to reach zero incidents over the long-term and across all units, for employees and for contractors. Even though Lafarge has continued to make progress, we still had 34 fatalities in 2011 which is deeply regrettable. To avoid future fatalities, the Group is producing "Key Learnings" for each fatal incident that are shared within every operation.

See pages 30 to 33.

## Communities

For Lafarge's 2012 Ambitions, the priority was placed on ensuring that the key personnel responsible for stakeholder engagement were trained on the Group's methodology. A key area was to ensure that our sites engage in effective programs with their communities. Lafarge is also maintaining or creating many partnerships to help it evolve its approach and rethink the way it can interact with other organizations.

See pages 34 to 41.

## Sustainable Construction

In order to offer solutions upstream in the value chain, the Group focuses on innovation and carries out research in collaboration with architecture firms and engineering offices. Lafarge is present in numerous bodies and working groups on an international and local level, to contribute to progress towards more sustainable methods of construction, in its sector and beyond.

See pages 44 to 47.

## Climate Change

Lafarge is implementing a comprehensive strategy contributing to the overall objective of limiting the Earth's temperature increase to a maximum of 2°C. The Group has set three new targets for 2015 and 2020, within the framework of its partnership with WWF. They encapsulate the entire construction chain.

See pages 48 to 53.

## Industrial Ecology and Recycling

Lafarge is adding value to waste by using it as an alternative fuel or material. In 2011 we recorded an increase in the substitution of fossil fuels, with 13% of our energy needs for cement production met by alternative sources, such as waste and biomass. We made progress on the biomass stream which represented 36% of total alternative fuels in 2011. Regarding raw material substitution, we have increased use by 2.3 million tons<sup>1</sup>, mainly due to finished product substitutes, such as slag and fly ash.

(1) throughout this report, tons refers to metric tons (1,000 kilograms).

See page 54 to 57.

## Managing our emissions

The Group has exceeded its reduction target for NO<sub>x</sub>, SO<sub>2</sub> and Dust. For persistent pollutants, Lafarge has continued its 10-year work with WWF to understand and reduce mercury and dioxin/furan emissions from our kilns. One of the biggest improvements in 2011 is the quality of the data we are collecting, particularly from emerging countries, after the release of a new measurement protocol at the beginning of 2011. For all emissions, the calculation method has been modified for current and past data to reflect the latest CSI protocols.

See pages 58 to 61.

## Biodiversity at our Sites

2011 was the International Year of Forests, a campaign which celebrated and raised awareness of the importance of forests in our societies. This past year we mapped all of our quarries and used IBAT to confirm the identity of the high biodiversity locations. We worked in partnership with WWF International to develop a guidance document for our operations and a leaflet for our visitors.

See pages 62 to 66.

## Water Footprint

A quarter of our cement production takes place in areas where there is high water stress. In 2011 Lafarge progressed further in its understanding of the water footprint and has set best practices for water management. Several installations of rainwater harvesting have been promoted as a model to limit the use of fresh water. In 2011 the water program was also expanded to aggregate quarries.

See pages 67 to 72.

## Sustainability Ratings

We are recognized for inclusion in the Dow Jones Sustainability Index with an overall score of 76%. We have also been reconfirmed for inclusion in both the Ethibel PIONEER and Ethibel EXCELLENCE Investment Register.

For the Carbon Disclosure Project, Lafarge is ranked 10<sup>th</sup> across industries worldwide and is a member of the Carbon Disclosure Leadership Index for the 6<sup>th</sup> year running.

See pages 73 to 77.



# Message from the CEO

## 2011

due to the economic context, created many challenges to progress on our global priorities while at the same time we were accelerating our actions within each country.

Nevertheless, focus was maintained on our 2012 set of Ambitions where improvement was recorded in most fields while some areas faced difficult challenges.

In the environmental domain, our goals were exceeded. After fulfilling our 2011 goal of a 20% reduction in net CO<sub>2</sub> emissions, we have now committed to reduce our net emissions by 33% in 2020 (compared to a 1990 baseline). Our efforts in this area were recognized by the Carbon Disclosure Project, where Lafarge placed tenth on its worldwide rankings - one of the highest positions of any industrialized company.

In order to accelerate our contribution towards a more sustainable world, more than half of our Research and Development efforts has been devoted to sustainable development. Our offer of low carbon materials/products and solutions have been extended, with product developments providing many attributes, such as comfort, energy efficiency and aesthetics, alongside sustainable products such as Hydromedia - a new generation porous concrete that allows for rainwater management.

A laboratory dedicated to the application of these innovations in local markets was opened in China and a second center was opened in India at the beginning of 2012.

Our social and societal actions were recognized by Boursorama who awarded us with the special CSR excellence prize and our actions were locally awarded in many countries. We have continued to work with the NGO Care on the measurement of the socio-economic footprint of our sites as we believe this will help improve the effectiveness of our local actions. We have also launched some pilot projects on affordable housing in Indonesia, Philippines, Honduras and France.

In order to address unemployment amongst young people, the number of student apprentices employed by our operations increased, allowing them to develop practical experience in industry. Local job creation projects continue to be developed by our sites around the world, in conjunction with partners in the surrounding communities.

We have maintained progress towards our Health and Safety targets. Even though we will not be satisfied until we reach zero fatalities, there has been a reduction in the lost time incident rate for both employees and contractors.

Our efforts to increase diversity are gaining momentum as the number of women in senior executive roles has risen to almost 16%, compared to 12% last year. Although challenging, we hope to reach 20% women in senior management in 2012.

Our commitment to sustainability remains core to our values and we intend to play a leading role in the construction material sector and wider industry in the coming years. As a result, we have been deeply involved in the preparation of the Rio +20 summit and we truly believe that sustainability requires a joint effort of governments and civil society acting together.

We believe that a sustainable and responsible company has to do more good and make a net positive contribution to the society. This will be the driving idea behind our Sustainable Ambitions for 2020.

**Bruno Lafont**  
Chairman & Chief Executive  
Officer of Lafarge

# Progress against our sustainability ambitions

We are entering the last year of our Ambitions 2007-2012 cycle. Many of these objectives have already been achieved, but a few require further progress.

## NEW TARGETS WILL BE ANNOUNCED IN 2012

TARGET	Deadline	2011 Performance	2010 Performance	WHY IS LAFARGE PURSUING THIS AMBITION? WHAT WILL CHANGE? HOW ARE WE PROGRESSING AGAINST THIS AMBITION?
<b>MANAGEMENT</b>				
On <b>safety</b> , reduce the employee Lost Time Injury Frequency Rate (LTIFR) for Lafarge employees to 0.94 or below in 2010.	2010	<b>0.63</b>	0.76	We continue to make progress with both our own employees and with contractors. Our contractor's LTIFR has also improved to the point where it also is better than the original target we set for our own employees.
Continue to check the implementation of our <b>Competition compliance program</b> in our business units. 100% of all significant business units tested for compliance by end of 2010.	2010	<b>96%</b>	96%	In past years we have reported on the implementation of our competition compliance program in all countries where we operate, with a special emphasis on competition trainings and verification of proper implementation by our business units. We now continue to follow-up this worldwide program with a self-assessment competition compliance questionnaire, which also includes Code of Business Conduct matters (such as anti-corruption rules). 100% of our operations submitted this survey in 2011, allowing the Group to consolidate all results and monitor compliance with our high business ethics standards. Further tools will be established in 2012, including a worldwide e-learning program dedicated to Code of Business Conduct at large.
Manage and improve our <b>local stakeholder relationship management</b> by: • training 100% of units in the local stakeholder relationship methodology;  • full reporting of the three new indicators.  Three additional targets (undertaking self-assessment on stakeholder relationships, launching a dedicated intranet site and providing an internal audit screening tool) were completed in 2009.	2012  2009	<b>Cement 76% A&amp;C: 80%</b>  <b>done</b>	<b>Cement 81%  done</b>	Training workshops focus on the key drivers for stakeholder engagement: Cement Plant Managers and Aggregates & Concrete (A&C) Area/Regional Managers. In 2011, over 260 people participated in trainings dedicated to this topic. For A&C, there is an improvement from the 22% reported in 2009 (no figure was reported for 2010 due to realignment undertaken during that year). The slight decrease for trained Cement Plant Managers likely reflects a change in personnel. The other objectives have been previously completed.
On <b>customers</b> , by 2012, the Group will achieve €3bn annual sales in new products.	2012	<b>€2.3bn</b>	€1.9bn	Although all sales were affected by the recession, sales of new products showed more resilience in the developed countries where they are primarily sold.
Reach 20% of <b>women in senior and executive management</b> (Lafarge Hay grades 18+) by 2012.	2012	<b>15.8%</b>	13.5%	At end of 2011, 15.8% of positions in senior management were held by women, a 16% improvement over 2010. Although it may be difficult for us to reach our target of 20% by end-2012, our program of inclusion which is used to attract and maintain women in both senior management and throughout the organization is making great progress.
<b>SOCIAL</b>				
By end 2010, establish a comprehensive Group-wide occupational health program including, at a minimum, regular medical examinations.	2010	<b>Completed</b>	Plan rolled-out	A protocol for Health Assessment (HASOP) has been developed and broadened in all business units to provide a standardized approach to risk-based medicals. This protocol will ensure that the relevant occupational and personal health risks are identified and managed. Assessments are now under implementation at business units level, and should be finished by 2014.
For HIV/AIDS and malaria, by end 2010, Lafarge will have extended to major emerging countries where it operates, its best practice implemented in Africa.	2010	<b>Completed</b>	Completed	Based on its experience in Africa, the Group has developed a manual and user guide to assess and manage relevant public health issues. Our public health methodology has been extended to Russia and Ukraine, where we have broadened our approach to reflect better the public health issues that are prevalent in these countries.

TARGET	Deadline	2011 Performance	2010 Performance	WHY IS LAFARGE PURSUING THIS AMBITION? WHAT WILL CHANGE? HOW ARE WE PROGRESSING AGAINST THIS AMBITION?
<b>ENVIRONMENT</b>				
● Have 100% of our sites <b>audited environmentally</b> within the last four years.	Perma- nent	<b>88%</b>	89%	We need to progress further to reach this objective.
● By end 2010 reach a rate of 85% of <b>quarries with a rehabilitation plan</b> complying with Lafarge standards.	2010	<b>86%</b>	84.5%	We reached this objective in 2011.
● By end of 2010, all our quarries will have been screened according to a criteria validated by WWF International.	2010	<b>97%</b>	91% <sup>(3)</sup>	Building on the screening program, in 2011 Lafarge mapped the location of all its quarries and screened them to confirm locations that are inside internationally protected areas or within 500m of them using IBAT (Integrated Biodiversity Assessment Tool).
● Sites in sensitive areas <sup>(1)</sup> will have developed a site <b>biodiversity</b> program by 2012.	2012	<b>49%</b>		Use of the IBAT tool resulted in a reassessment of the list sites in sensitive areas.
● By end 2010: • cut our worldwide net <sup>(2)</sup> CO <sub>2</sub> emissions per ton of cementitious by 20% compared to 1990. During 2011, a new objective of reduction of 33% vs 1990 by 2020 was set.	2010	<b>-23.3%</b>	<b>-21.7%</b>	Our new CO <sub>2</sub> emission reductions objective was made public in June 2011 after having widely consulted our stakeholders and our partner WWF. By end of 2011, we have made significant progress, in line with our new objective.
● Cut our <b>dust emissions</b> in our cement plants by 30% over the period 2005-2012.	2012	<b>-38.9%</b>	<b>-33.5%</b>	Although cement plants generate dust, we have continued to make significant progress in lowering emissions through revamping or replacing less efficient air pollution control devices.
● Cut our <b>NO<sub>x</sub> emissions</b> in our cement plants by 20% over the period 2005-2012.	2012	<b>-33.4%</b>	<b>-27.9%</b>	NO <sub>x</sub> is emitted from virtually every combustion, including cement manufacture. Since achieving our targeted reduction in 2009 we have continued to implement NO <sub>x</sub> abatement technologies such as SNCR (Selective non catalytic reduction) and many of our newer kilns are designed with low-NO <sub>x</sub> precalciners.
● Cut our <b>SO<sub>2</sub> emissions</b> in our cement plants by 20% over the period 2005-2012.	2012	<b>-51.3%</b>	<b>-52.8%</b>	SO <sub>2</sub> can be another unwanted product of some cement kilns. After reducing emissions by around 50% since 2007; in 2011 we started to install abatement systems whose reductions will be seen in future years.
● By end 2010 have a baseline for <b>persistent pollutants</b> in our cement plants for 100% of kilns and reinforce our Best Manufacturing Practices to limit emissions.	2010	<b>100%</b>	100%	Persistent pollutants are emitted by cement kilns. Lafarge is working with WWF to achieve significant reductions in emissions. The program has completed measurement of persistent pollutants in all operating kilns. Plant specific action plans have been developed to reduce emissions from a group of top-emitting plants. Progress with reducing emissions will be monitored and reported.

Progress on our Sustainability Ambitions:

- Fully achieved
- Partially achieved
- In progress

(1) Sensitive areas are defined as quarries within 0.5km of IUCN I-VI, Ramsar, IBA, Natura 2000.

(2) Net CO<sub>2</sub> emissions are the gross emissions less the emissions that come from burning waste.

(3) The change from the figure reported in 2010 is due to a change in definition of active quarries.



# Values & governance within Lafarge

Good governance is an integral part of sustainable development. At Lafarge, governance is based on strong ethical principles.

## Our values

With the Group's growing presence in parts of the world undergoing radical social and political changes, we are more than ever convinced that our values are an increasingly important source of strength and pride. Lafarge has a long tradition of applying the values evoked in its Principles of Action in everything that it does. This can be very challenging as we must be sensitive to the social context in which we operate.

“Lafarge's Code of Business Conduct is well established and to ensure wide accessibility we have developed an e-learning module.”

The Lafarge “Principles of Action” define Lafarge values. Courage, integrity, commitment, consideration for others and an overriding concern for the Group's interests are the foundation of our management philosophy. These values are to be adopted by all Lafarge employees, everywhere. The Code of Business Conduct supports and accompanies the Principles. First adopted in 2004, it sets out the principles of conduct that each individual is to adopt in everyday business situations. It covers compliance with laws and regulations, free competition, prevention of corruption, insider trading, conflicts of interest, participation in politics, health and safety, prevention of discrimination and harassment, respect for the environment, protection of assets, reliability of information, internal control and application of sanctions.

## Business conduct and competition rules

The **Code of Business Conduct** sets certain standards of behavior for all employees and executives of the Group as well as for suppliers of goods and services. The code is designed to build trust at all levels. A Group-wide dedicated telephone line is available for employees to report any violations of this code. Training to enhance the Code's adoption started in 2008. It is based on case studies taken from real business examples and has been reviewed by Transparency International, the International Chamber of Commerce and Lafarge Stakeholder Panel. To ensure that the training is accessible to every Lafarge employee, we have developed a dedicated e-learning module, released in February 2012. The Group also set up a **Competition Compliance Program**. Deployed continuously, it includes awareness building and training for employees and verification at business unit level (96% of them have been tested at the end of 2011).

## Risk assessment

Sustainable development factors are taken into account when assessing the company's risks and planning for them.

Risk factors subject to special attention include:

- **the supply of raw materials:** in some countries, reserves of mineral resources are being exhausted, which is leading to shortages,
- **“country” risks associated with some emerging economies.** The Group is particularly attentive to risks related to human rights and corruption. Since 2009, Lafarge is a member of “Entreprises pour les Droits de l'Homme” (EDH), a group of eight France-based companies working on understanding better human rights challenges.

These risks are assessed annually on the basis of suitable indicators.



# “ EDH and Lafarge are jointly developing a handbook to assist in the implementation of the Ruggie report recommendations. ”

## Openness to outside opinions

Lafarge calls upon external expertise through:

- the stakeholder panel;
- the biodiversity advisory panel.

Important Environment and Sustainability indicators presented in the Sustainability Chapter of the Registration Document (specific list of indicators included therein) are verified to obtain limited assurance by an independent **ratings and auditing agencies** (Ernst & Young, in the case of the 2011 Report). The balance of the data presented in the Sustainability Chapter of the Registration Document is subject to an assertion review by the auditing agency.

Finally, Lafarge has, for several years, invited an annual external evaluation of its performance with regard to corporate governance, the environment and social goals. These evaluations are performed by independent **extra-financial rating agencies**, such as Vigeo.

This openness to dialogue and constructive criticism reflects Lafarge's commitment to continuous improvement and progress.

## Independent directors

Lafarge's Board of Directors is composed of **17 members, 10 of whom are independent, including three women**. The four committees of the Board are led by independent Board members.

The newly-created position of Vice Chairman of the Board is reserved for an independent director. This decision reflects Lafarge's determination to continue to implement the best practices with regard to transparency and governance.

## Human Rights

Lafarge recognizes the utmost importance of respecting human rights in all countries where it operates and believes that human rights must be addressed in business-decision making. For that matter, we welcomed the recommendations of the UN Secretary-General's Special Representative on businesses and human rights (aka “the Ruggie Report”) published in 2010. To ensure that the respect of human rights is clearly embedded in our policies and programs, we mandated a comprehensive review. The overall assessment was positive, but a key task for 2012 will be to update policies to ensure that they still reflect the level of commitment of the Group.

In addition, since 2009, we have been working through “Entreprises pour les Droits de l'Homme” (EDH, a group of eight France-based multinational companies inspired by the Business Leaders' Initiative for Human Rights and co-founded by Lafarge) to better understand our human rights challenges and share best practices. In 2011, as in every year, several employees attended training sponsored by EDH so that awareness of human rights can be cascaded throughout the Group. Employees attending the training included heads of several key functions such as internal control and sustainable development and public affairs. In 2012, continuing a project started in 2011, EDH and Lafarge will jointly develop a handbook geared toward managers within our business units to provide practical guidelines for the implementation of the recommendations of the Ruggie Report (e.g. human rights due diligence, etc.). Finally, we recognize the UN Declaration on the Rights of Indigenous People, the OECD Principles of Corporate Governance, and the United Nations Global Compact. We are committed to reflecting those principles through the Group's policies, and in our day-to-day practice. Especially, we are part of the French chapter of the UN Global Compact, namely: le Forum des Amis du Pacte Mondial. With over 750 members, it is the second largest local chapter. It enables us to establish a constructive dialogue with other companies - multinationals and SMEs equally - so that the 10 key principles of the Global Compact are reflected in their practices. Those 10 principles include:

### HUMAN RIGHTS

- Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
- Principle 2: make sure that they are not complicit in human rights abuses.

### LABOR

- Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labor;
- Principle 5: the effective abolition of child labor; and
- Principle 6: the elimination of discrimination in respect of employment and occupation.

### ENVIRONMENT

- Principle 7: Businesses should support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote greater environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

### ANTI-CORRUPTION

- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

## Management of sustainability

Sustainability is under the responsibility of the Executive Vice President for Strategy, Development and Public Affairs, who sits on the Group Executive Committee.

The Senior Vice-President, Sustainable Development and Public Affairs, has functional responsibility for sustainability, managing:

- A dedicated team at corporate level,
- A network of managers in all Lafarge countries, with functional responsibility for sustainability, who usually are part of the Country's Executive Committee.

The Sustainable Development and Public Affairs Department designs the Group sustainability strategy, and oversees its implementation by countries. In addition, it develops Group policies and key performance indicators and is in charge of sustainability reporting. Finally, the Department liaises with stakeholders, such as sustainability ratings agencies, non-governmental organizations, business associations and networks and public authorities.

The Group Executive Committee validates sustainability strategy and policies, in accordance to the Group's vision and values, and meets every year with the Stakeholder Panel. There is also a dedicated Strategy, Development and Sustainable Development Committee within the Board.

Sustainable development is embedded in every manager's personal objectives, which determine part of their financial bonus.

In addition, every industrial site has environmental targets, part of a group-wide Environmental Management System.

## Lafarge Board of Directors

The Board of Directors is the primary governing body of Lafarge. It determines the Group's strategy and supervises its implementation.

### ... Responsibilities

The Board of Directors of Lafarge:

- approves the annual and half-year financial statements,
- calls the Annual Shareholders' Meeting,
- sets compensation for senior managers,
- participates in general management decisions.

### ... Membership

The Board of Directors of Lafarge has 17 members, of whom 10 are independent, including three women. The position of Vice-President of the Board is reserved for an independent director. This decision highlights Lafarge's determination to continue to implement best practices in corporate governance.

The Annual Shareholders' Meeting appoints directors for a period of four years.

### ... Rules & operations

As stipulated in the bylaws, the Board of Directors meets at least four times per year. In 2011, it met seven times with an average attendance rate of 93%.

## Shareholders Meetings

All Lafarge shareholders have the right to attend the Group's General Meetings. General Meetings allow shareholders to remain well informed, meet the management team and express opinions about the Group's strategy.

### ... Attending the Shareholders' meeting

All shareholders have the right to attend General Meetings regardless of the number of shares they hold.

Shareholders can vote:

- by attending the Meeting,
- by post,
- by giving a proxy to a person of their choice or the Chairman of the Meeting.

If shares are registered, full documentation enabling shareholders to take part in General Meetings is sent to the shareholders automatically.

If a shareholder owns bearer shares, they can ask their account holder for the meeting documentation.

### ... Voting at Shareholders' General Meeting

Each holder of shares is entitled to one vote per share.

Double voting rights are attached to fully paid-up Lafarge shares registered for at least two years in the name of the same shareholder. During the General Meeting, above the threshold of 5% of the rights, the number of voting rights is adjusted on the basis of the percentage of the capital represented at the General Meeting. This adjustment mechanism does not apply when the quorum at the General Meeting is greater than two-thirds of the total number of voting rights.



## PANEL

ALASTAIR MCINTOSH  
VALUES AND GOVERNANCE

I have served on the Lafarge panel since 2004, arising out of a question of values with which I was closely involved nearly a decade ago. Why do I bother, especially in an unpaid capacity?

I bother because the economy is a subset of the natural environment, and not the other way around. We are all complicit in the impact of our economic actions and must therefore either deny our complicity, or take a part in developing responsible ways forward.

Over these past 9 years I have been impressed by how senior executives of Lafarge wrestle with the ethical issues that they encounter. Measures like the Lobbying Charter, the Anti-Corruption policies and Lafarge's current exploration of 'free, prior and informed consent' with indigenous peoples are of huge importance. They are not just legislation driven. They are also being proactively led by women and men who want to be proud of their work.

Today's corporations are, thank goodness, being pressed to raise responsibility and move towards 'shared value' with stakeholders. Lafarge has developed a lead position in this movement. Competence and conviction in governance at every level of the group are central to seeing this through.

Failures now would leave the group open to embarrassment, even litigation. Success will lead to deeper values and, I hope, be sustained by generating value towards a more win-win future.

# Public positions and policies

Lafarge advocates on important industrial and societal issues.

## Responsible lobbying

For Lafarge, it is important to anticipate important issues for the company and its political, legal and business environment and to react or adapt to new regulations. For that matter, we are engaged in a permanent dialogue with our stakeholders, especially national, regional and local governments, in accordance with the Group's Principles of Action, Code of Business Conduct and Lobbying Charter. The Lobbying Charter outlines the 3 major principles which are fundamental to our responsible lobbying practice:

- Transparency;
- Stakeholders' dialogue;
- Coherence with the Group's strategy and values.

In the wake of the new Group organization effective in 2012, we are building an internal network of operational managers and executives, dedicated to Public Affairs. This will enable us to fulfill our commitment to responsible lobbying and ensure that this program is implemented throughout Lafarge.

## Lobbying within business associations

The Group Public Affairs Department, under the authority of the Executive Vice President for Strategy, Development and Public Affairs, is responsible for the coordination of advocacy actions within Lafarge. As such, it ensures that the Group's long-term interests – in line with broader societal interests – are taken into account by public authorities within the highly regulated environment of the building materials industry.

Lafarge experts and managers, starting from the CEO Bruno Lafont, are playing an active role in trade and sectoral associations, lobby groups and think tanks to leverage their influence in the public sphere, at global, national or local level.

## Lobbying actions in 2011, at EU level

In 2011, according to public positions defined in 2010, our lobbying actions within the European Union were primarily focused on climate change, energy efficiency and resources efficiency issues.

With regards to climate change, the European Union finalized in 2011 the implementation guidelines for the **third phase of the EU ETS**. The European Commission also published a **"Roadmap for a low carbon economy by 2050"**. We support this road-

map for the long term visibility it provides to investment decisions; in parallel, we are currently designing, within CEMBUREAU, the European association of cement manufacturers, a European cement industry low carbon economy roadmap 2050. This analysis will contribute to the application and effectiveness of the European global Roadmap. The European Commission launched an **"Energy Efficiency"** Action Plan enhancing national frameworks towards energy efficiency and energy savings. We welcome this Action Plan and support the subsequent Directive on Energy Efficiency which sets out several energy efficiency requirements for end-user sectors. We support this Directive through our trade associations.

**In 2011 our actions focused on climate change, energy, and resource efficiency.**

In 2011 we continued to lobby on the **"Raw materials strategy"** with a strong focus on its second pillar, seeking better access to local resources in the future. Furthermore, the **"Roadmap to a resource efficient Europe"** is a topic of particular importance for our activities as it covers a range of tools and areas such as ecosystem services and biodiversity, water management, waste and recycling that have a direct impact on us. Therefore, we met with several Members of the European Parliament and representatives of the European Commission to promote re-use and recycling of construction materials.

The **"Waste Framework Directive"** allows for certain waste streams to be considered as waste. Consequently, we presented our views at European and national levels, on when waiving the waste status may be justified for a limited selection of waste streams, insisting that this should only occur under strict conditions where the waste can be valorized.

At the end of 2011, the World Business Council for Sustainable Development's Cement Sustainability Initiative (WBCSD-CSI), actively supported by the

European cement association Cembureau, played an active role to form a Cement Industry Partnership to develop best available techniques and provide other information to support a “Legally Binding Instrument on Mercury Emissions”, by 2013, under the umbrella of the United Nations Environment Program (UNEP).

### Political contributions

In most areas, Lafarge or its related entities do not contribute directly to the financing of the campaigns of political candidates. However, in the United States, when any collection of individuals wants to contribute to the funding of federal candidates or parties, it may do so through a Political Action Committee (PAC).

PACs allow individuals to join their single contribution to a pool of funds to have a louder voice for political expression. As part of the standard US political system, the employees of Lafarge North America Inc. use a PAC to raise voluntary political contributions to support candidates in the US who the employees feel share the company's goals.

The PAC is a separate legal entity from the company. The PAC does not necessarily agree with all the policy positions of candidates who receive its contributions. Support to candidates is based on whether the candidate is attuned to the well-being of the company and its employees and the ability of the candidate to work towards these goals.

More information about the PAC can be found at [www.lafarge-na.com](http://www.lafarge-na.com) and the full list of beneficiaries can be seen at <http://www.fec.gov>.

The United States Supreme Court's decision in *Citizens United v. Federal Election Commission* opened up the option of using corporate funds for independent (not controlled by the candidate) advocacy supporting or opposing Federal candidates, or for contributions to issue groups or so-called “SuperPACs” undertaking such expenditures. In the 2012 election cycle, Lafarge North America, Inc. has not done this to date. While employees of Lafarge North America Inc. continue to manage and utilize their PAC, Lafarge North America Inc. has not utilized corporate funds for Federal political campaign activity in the 2012 election cycle.

Should Lafarge North America Inc. decide that the contribution of company funds for political campaign advocacy activity is warranted in the 2012 election cycle or future election cycles, it will assure that such contributions are made to a SuperPAC that publicly discloses its donors. In addition, Lafarge North America Inc. will, for the benefit of its shareholders and stakeholders, disclose such contributions within 48 hours on the Lafarge North America Inc. website ([www.lafarge-na.com](http://www.lafarge-na.com)).

### Climate change

We are developing and implementing a comprehensive strategy to contribute to the overall objective to limit the Earth's temperature increase to a maximum 2°C.

We believe that the fight against climate change is about fundamentally reshaping our economy, from the way electricity is generated and products are manufactured, to how we design buildings and cities and live and work.

Worldwide, we are already committed to the transition to a new sustainable economy. All of our operations are engaged in CO<sub>2</sub> emission reduction and we are making significant improvements.

We are changing our consumption behavior as a company, addressing the training and education needed for new skills and competencies, and encouraging innovation using low carbon solutions contributing to energy efficiency in buildings.

We believe Governments have a key role to play in accelerating and facilitating this transition towards a new sustainable economy. We look forward to an international legally binding agreement on climate change. But since the starting points differ from one country to another, intermediate actions (such as “Nationally Appropriate Mitigation Actions”) and sectoral approaches are the most pragmatic solutions to be implemented today.

The sectoral approach promoted by the Cement Sustainability Initiative within the World Business Council for Sustainable Development, which comprises a combination of market based mechanisms and adapted supporting policies (use of biomass, waste, alternative cementitious materials, norms and standards), has the potential to deliver the largest CO<sub>2</sub> emission reductions.

In 2010, critical decisions governing aspects of Phase 3 (2013-2020) of the EU Emissions Trading Scheme Directive were adopted; they covered allocations, benchmarks and auctioning rules. We welcome these decisions, even if implementation will be challenging for us. We will pursue our CO<sub>2</sub> emissions reduction efforts in our EU operations as well as in all other countries where we operate.

We believe that for our industry, the most appropriate and efficient approach to CO<sub>2</sub> emission reductions in advanced economies, is a cap and trade\* system with benchmarks based on clinker.

In emerging economies, we support mechanisms which are based on sectoral intensity goals, policies enabling waste and biomass sourcing and harmonizing standards for cement and concrete.

We consider that climate change policy should not only be limited to targets for CO<sub>2</sub> emissions reduction. Policies to encourage energy efficiency, innovation in the value chain (notably in buildings), promote renewable energies, and incentivize research and development should be the current priorities and will deliver potentially more CO<sub>2</sub> emission reduction.



**PANEL**  
**SHEILA KHANA**

During recent discussions of the Ambitions 2020, I highlighted the importance of water resources management as a critical part of the sustainable development agenda for several reasons. Firstly, the extent of water usage by the industry upstream and downstream makes the issue relevant from an environmental impact management perspective.

Secondly, in many communities in which Lafarge conducts business, water resource scarcity is a major source of concern and a real impediment to economic development. Therefore the issue requires careful management. By the same token, water scarcity affects the quality of the lives of communities that have limited access to water supply for domestic and subsistence agricultural purposes. Procuring water for Lafarge's operations in a manner that not only mitigates environmental risk to underground aquifers, rivers and lakes but carefully balances industry and community needs is to me a critical component of sustainable industry practice.

In this respect I believe that Lafarge is very well placed to provide leadership and guidance to communities on water usage practices that reduce its carbon footprint and ensure that ground resources are efficiently managed and that extraction from underground sources enables the wells to recharge.

In so doing Lafarge can ensure that industry flourishes but not at the expense of the economic livelihood of water resource dependent communities.

**“Climate change policy must incorporate more than CO<sub>2</sub> emission reductions and should include the entire value chain, most notably buildings.”**

#### **Resources and biodiversity**

Limestone, chalk, sand, clay, aggregates and gypsum provide the mineral resource base for our products. Our use of these resources can affect biodiversity and ecosystems, directly or indirectly throughout the life cycle of a quarry. We consider that our extractive activities are compatible with biodiversity protection; we believe that, with proper planning and rehabilitation, we can in some places make a net positive contribution to biodiversity conservation and ecosystem management, and thus protect our long term resources.

Local access to resources is critical; producing materials close to the point of use minimizes environmental and economic impacts such as CO<sub>2</sub> emissions, noise and cost. Therefore the planning framework for mineral extraction must be comprehensive. We believe that there needs to be simplified and coordinated regional, national and local planning procedures to ensure the sustainable supply of resources. We support a “one stop shop” system for applying for authorization, with all environmental aspects assessed in a single process as it has been proposed at European level.

#### **Efficient use of resources**

Mainstreaming ecosystem considerations into business is increasingly important as a way of addressing the challenges of a resource-constrained world; we are contributing to further development of effective tools for valuing ecosystem services.

Our industry supports efficient management of natural resources and the use of recycled resources; its use of alternative fuels and raw materials has been recognized as best practice by the European Commission. But we do need access to materials which can be recycled, recovered or reused from other industries, such as construction and demolition waste. We also believe that greater use of recycled resources could be achieved if product standards were defined with recycling in mind.

We believe that building partnerships with non-governmental organizations, working with conservation bodies and engaging with local or global stakeholders allows us to develop more responsive and comprehensive biodiversity and habitat rehabilitation plans; these actions contribute to Lafarge’s credibility in the local community. This in turn enables us to operate effectively in a sector which depends on sustainable use of resources.

\* The “cap” is the maximum - and decreasing - amount of carbon to be emitted and the “trade” is the possibility given to carbon emitters to freely trade carbon permits amongst themselves.

#### **The business role in biodiversity**

At international level the role of business in addressing biodiversity loss and ecosystems degradation has been fully recognized. So there is a need for our industry to work (either directly or indirectly through trade associations) with governments; this work should seek to secure consistent policy frameworks and legislation, clear long-term signals and a level playing field.

The outcome of the Convention on Biological Diversity held in Nagoya in December 2010 led to the adoption of targets on reducing the loss of biodiversity and commitments to restore degraded areas. We are committed to the restoration of habitats, so as the targets are translated into national biodiversity action plans over the next two years. We will contribute to these goals.

**“In many places we can make a net positive contribution to biodiversity conservation and ecosystem management.”**

In 2011 the EU set a new target to halt the loss of biodiversity and the degradation of ecosystem services by 2020, and restore them as much as is feasible, while stepping up the EU contribution to averting global biodiversity loss. It is our view that the integration of biodiversity and ecosystem concerns into other policies will be essential to the achievement of these aims. Because of the nature of our activities, we are often faced with difficult situations where we must balance competing interests of many parties. We must listen to our stakeholders and respond to them.

# reporting

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# Understanding the Group's business

In 2011 we refocused our business on our main product lines: cement and aggregate & concrete.

## Lafarge in figures

### 2011/2010 performance and improvement indicators

(€ million)

	2011	2010*
Sales	15,284	14,834
Operating income <sup>(1)</sup>	2,179	2,393
Free cash flow	1,208	1,761
Net debt	11,974	13,993
Net income group share	593	827
Net earnings per share in euros	€2.07	€2.89
Net dividend in euros	€0.50	€1.00

(1) Before capital gains, impairment, restructuring and other.

\* Adjusted for disposals for comparison purposes.

## Lafarge's economic impacts

### Who benefits from our operations

(cash value added)

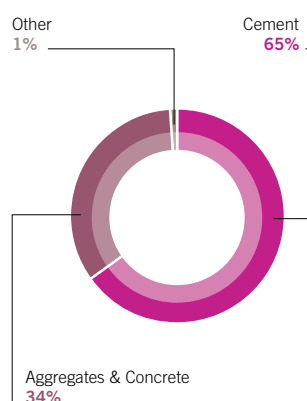
	€ million	%
Sales	15,284	
Cost of goods sold	9,765	
<b>Cash value added<sup>(1)</sup></b>	<b>5,519</b>	<b>100</b>
Paid to employees for their services	2,452	44.4
Paid to lenders as a return on their borrowings	999	18.1
Retained for growth	1,077	19.5
Community investment	20	0.4
Net cash	971	17.6
Income taxes to be paid to governments <sup>(2)</sup>	484	49.8
Paid to investors for providing capital <sup>(2)</sup>	487	50.2

(1) Figure adjusted to take account of community investment.

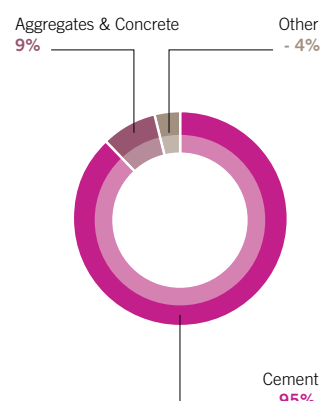
(2) Percentage of net-cash.

Source: Lafarge 2011 data

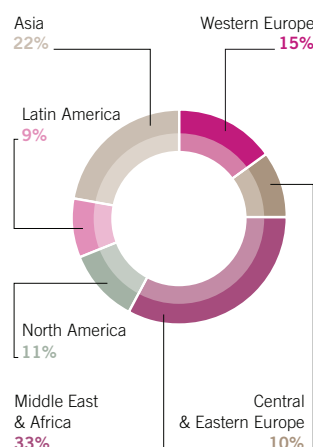
### Distribution of sales by Business (12/31/2011)



### Distribution of income by Business (12/31/2011)



### Geographical distribution of sales (12/31/2011)



### Shareholders by type and geography

(in %)

	2011
<b>By Type</b>	
Individual shareholders	11.6
Treasury shares	0.1
French Institutions	15.7
Non-French Institutions	72.6
<b>By Geography</b>	
France	27.2
United States of America	17.6
Belgium	21.5
Luxembourg	14.2
Rest of world	19.5



## The Cement Business Strategy

The cement market is expanding rapidly in emerging countries as a result of strong urban, economic and demographic growth. Lafarge is reinforcing its position in these markets by developing new production capacities and building new plants.

### Cement: key to development

Over the past twenty years, world cement consumption has significantly increased with an average growth rate above 5% per year. Despite the economic and financial crisis, global cement demand grew by approximately 8% in 2011, supported by the dynamism of most large emerging markets, particularly China, Brazil, India and Sub-Saharan Africa. Mid and long-term prospects for cement demand remain favorable, especially in these markets, where demography and urbanization drive the needs for housing and infrastructure. Emerging markets accounted for 71% of Group's current operating income (76% for the Cement Division) in 2011.

We believe that we are in a very good position to benefit from this long-term fundamental growth thanks to our well diversified geographical portfolio, strengthened during recent years by our cement capacity increase program and the acquisition of Orascom Cement in January 2008. Most of our new production capacity projects are located in emerging markets.

## Consolidating the Group's leadership position

The aggregates market remains very fragmented, with many independent operators and local producers. The Lafarge Group possesses a number of strong competitive advantages that secure its global leadership position, including:

- expertise throughout the value chain, from obtaining licenses to extraction,
- experience with and knowledge of local markets,
- cost reduction programs,
- a capacity to anticipate changes in the supply of resources,
- proven quarry rehabilitation practices that respect the environment and biodiversity,
- a global presence, which enables the systematic sharing of best practices in strategy, sales, marketing, manufacturing and site management.

Lafarge is moving quickly to establish a presence in fast-growing emerging markets. The challenge is significant, as it is not simply a question of gaining market share but of doing so in a way that respects regulations and the Group's quality standards, both of which can require expensive upgrades to infrastructure.

### Sustainable quarry management

Managing mineral reserves is a key concern for Lafarge. To maintain its operational reserve levels, the Group undertakes acquisitions and actively seeks new growth opportunities, particularly in emerging economies.

Lafarge enjoys a relatively favorable position:

- the Group's authorized reserves represent about 40 years of operation,
- since 2006, increases in reserves exceeded annual consumption, as a result of targeted acquisitions in the United States (in Arizona and the Chicago area) and in Poland.

Lafarge manages its aggregates reserves according to two main principles:

- reduce the impact of operations on the environment,
- minimize inconvenience for local communities.

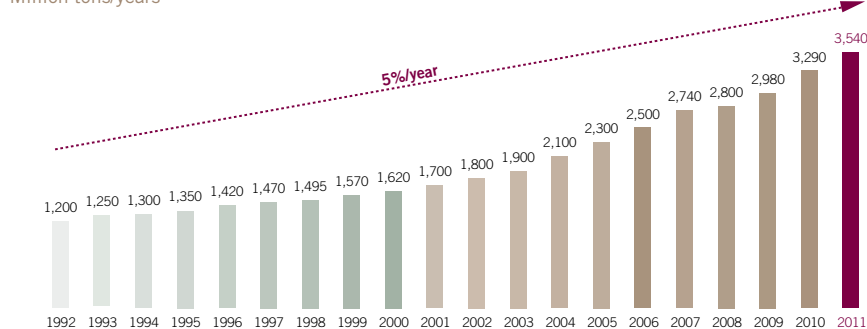
Lafarge is committed to serving the environment, particularly through a pro-active policy of quarry rehabilitation. The Group also undertakes information and communication campaigns to inform local residents about its capacity to preserve the environment.

### Anticipating a decline in resources: aggregates research

Lafarge is the only building materials company to conduct research regarding aggregates. Aggregates are a limited natural resource, so R&D teams are working to improve:

## Evolution of World Cement Market

Million tons/years



Sources: Lafarge estimates

By reinforcing the position of the Cement Business in emerging markets, the Group will also be better placed to develop its Aggregates and Concrete Businesses in these markets.

## The Aggregates Business Strategy

Lafarge enjoys recognized expertise in aggregates production and is seeking to consolidate its strengths, develop its business in emerging countries and pursue sustainable quarry management.

- industrial processes,
- the use of quarry materials, with the goal of using all aggregates extracted regardless of their source.

## The Concrete Business Strategy

Synergies between the Concrete, Aggregates and Cement Businesses reinforce the Group's positions and provides a competitive advantage in a great many markets. The Concrete Business is particularly innovative and is enjoying significant success with ultra-high performance concretes.

### Integration and synergy with the Group's other Businesses

Lafarge's different Businesses are closely linked to each other. In many markets, the Group's cement and aggregates products are used to manufacture ready-mix concrete. Lafarge drives synergies and vertical integration across its different markets. For example: the acquisition of Orascom Cement in January 2008 is a platform for the development of the Group's concrete capacities on the growing markets in the Middle East and North Africa.

These synergies can also be found in R&D. Parallel research programs in cement, aggregates, concretes and additives give the Group a measurable technological advantage.

### Innovation as a top priority

Lafarge is dedicated to the production of concretes that deliver high added value to customers. "TURBO", the R&D program specific to the Concrete Business, saw its budget grow by 85% between 2006 and 2009!

It is focused on developing the concretes of the future:

- concretes with optimized qualities, suitable for made-to-measure products which are robust, aesthetic, resistant to cracking and energy-efficient,
- concretes adapted to all applications.

Market penetration of value-added concretes has increased and should account for 35% of the Group's concrete production in volume. The major international brands Agilia®, Artevia®, Ductal®, Extensia® and Chronolia®, reinforce the Group's leadership in this sector.

### Protecting the environment

Lafarge's industrial processes have been designed and refined to minimize their impact on the environment.

The use of certain additives (which act as effective substitutes) during concrete production can help to reduce the consumption of nonrenewable natural resources.

Furthermore, in 2011, 67.3% of Concrete & Aggregates sites have installed water recycling systems.

## Innovation at Lafarge

### Innovation, Research & Development (R&D)

Innovation remains one of the Group's two strategic priorities. The Group's R&D activities focus on three main objectives: researching new products and systems that offer increased value-added solutions to our customers, developing our product ranges to respect our commitments in terms of sustainable construction, and implementing processes and products that help reduce CO<sub>2</sub> emissions. In 2011, the overall Group expenditure for product innovation and industrial process improvement was 129 million euros, compared to 153 million euros in 2010.

### High level research teams and international network

The Group's Research investments are mainly based at the Lafarge Research Center (LCR), located near Lyon in France. Today, this research center is made up of approximately 240 talented men and women: engineers and technicians who come from various scientific and international backgrounds. LCR is an acknowledged leader and continues to attract researchers from all over the world. LCR's research activity is organized in a matrix structure based on scientific competencies and management of different project portfolios.



**Lafarge is focused on developing the concretes of the future through increased R&D programs.**



The organization of LCR's expertise and scientific management was strengthened in 2011 and international partnerships were significantly increased, particularly in emerging markets. More specifically, in March 2011, the Group signed a partnership agreement with IIT Madras, India to set up a new research laboratory on concrete durability. It also concluded a research partnership agreement with Chongqing University, China in September. In addition, a symposium jointly organized in July in Beijing with Tsinghua University and China Ceramic Society brought together over 150 representatives from China's construction industry as well as a panel of international scientific leaders (from China, USA and Europe) specializing in our domains. They presented the latest scientific breakthroughs in concrete science as well as the wide scope for the use of concrete in sustain-

able construction. Finally, the Lafarge Academic and Research Chair (École des Ponts ParisTech) on Materials Science for Sustainable Construction was renewed in 2011. After MIT (Massachusetts Institute of Technology) in 2007, Berkeley in 2008, Georgia Tech in 2009 and Delft in 2010, students from the Master's supported by this Chair attended a three-day seminar at MIT. This confirms the interest of foreign universities in a doctorate program which remains today the only one of its kind in the world.

**“Lafarge's R&D was strengthened in 2011 through international partnerships and new satellite facilities, particularly in emerging markets.”**

#### **Well-established innovation dynamics**

Members of the Group's Executive Committee come to LCR regularly to air their expectations and challenge researchers in terms of “the field of possibilities” and the results obtained within the research programs undertaken and financed by the Divisions. The dynamics for boosting our project portfolio are sustained by the impetus of a Creativity team composed of volunteer engineers and technicians. They have carte blanche to stimulate the emergence of new ideas in line with our strategic goals and in liaison with our marketing teams. Furthermore, we are continuing to widen our sources of innovation, in particular with the second edition of our “Lafarge Invention Awards 2011” a contest open this time to construction scientists and inventors in India. Over 60 submissions were collected and 3 winners were awarded prizes at an awards ceremony in Mumbai in March 2012. The objective of the contest was to reward innovative Indian projects related to Lafarge materials and contributing to sustainable construction. It was also an opportunity to broaden the Group's scientific network in India and to establish contacts with the best Indian research teams.

#### **Innovative research focuses**

Our research work for the Business Divisions in 2011 was directed as follows:

##### **CEMENT**

We pursued our work to reduce the carbon footprint of our products. We successfully performed an industrial trial to produce Aether™ clinker, which allowed us to confirm a 25% reduction of carbon emissions per ton of clinker, as well as a 15% reduction in the energy needed for burning, achieved

without any significant process modifications.

The European Union has lent us its financial support for this project as part of the Life+ program.

We continued to support the Novacem start-up, whose objective is to produce a magnesium silicate binder (an alternative to limestone and clay with which our cements are manufactured) via a process with potentially low carbon emissions.

Increasing the percentage of mineral additives in our cements remains a priority as it helps to reduce the environmental impact. This research work is based on the fundamental research results obtained by the Nanocem European research network. We also accelerated our research on the impact that high percentages of additives have on concrete durability.

We pursued a number of programs aiming to differentiate our products for specific segments of the construction market. The priority was given to bagged cement for masonry work and low cost binders for affordable housing.

We also began new research work into the cement manufacturing process, especially grinding and the preparation of alternative fuels used in our kilns, as well as new design concepts for our installations to reduce our investment costs.

We are fostering an active partnership with the MIT (Massachusetts Institute of Technology) as part of the CSHub (Concrete Sustainability Hub). This ambitious project aims to describe the fundamental mechanisms governing cement performances and to identify the innovation levers for reducing environmental impact, using the most advanced tools from materials science, in particular molecular computing methods.

Amid the economic conditions currently prevailing, cutting production costs and raising operational performance are more than ever major priorities for our Cement business. To this end, the Division is backed up by our network of Technical Centers providing plants with the permanent support of their high-caliber experts in all the key areas of the cement industry, i.e. Safety, Environment, Geology, Processes, Products and Equipment. Aside from providing strong support to operations with the deployment of a genuinely safety-oriented culture and assisting in the reduction of the environmental footprint of our plants, the Technical Centers particularly support the rapid deployment of the performance programs launched by the Division, such as Excellence 2010. By focusing on the principal levers of industrial performance, including reducing power and heat consumption, increasing the use of cheap alternative fuels and cement additives, and cutting fixed costs, this program focuses the Cement Division's attention on objectives that will pave the way for cost reductions in the short to medium term. Likewise, the continuous improvement programs to enhance plant reliability, the installation of automatic control systems for kilns and grinding plants, assistance with the development of new products and the industrialization of the R&D's results also form part of the Technical Centers' role.

**“ We have completed our research work on new concretes with high performance environmental characteristics such as low carbon concretes and Hydromedia™ pervious concretes. ”**

Late 2010, we launched a program for further improving our plant's mastery and technical performances. This program is based on worldwide implementation of a single operational model, on competency certification programs and on clear and simple industrial standards. The implementation is monitored by the Technical Centers and will be audited on a regular basis. This new program will not only increase our performances rapidly but will also help to sustain them more reliably over the long term. The Technical Centers are also responsible for integrating recently built plants and newly acquired units, which can thus adopt the Group's standard practices and rapidly deliver high performances. Generally speaking, the Technical Centers continuously analyze and benchmark the results of the plants and are able to respond very rapidly to the slightest dip in performance, sending in their experts promptly in the event of a serious incident in order to analyze and resolve the underlying problems. Lastly, the Technical Centers are responsible for capitalizing, sharing and implementing best practices and technical standards, which aim to sustain the benefits of short-term initiatives over time.

#### **AGGREGATES & CONCRETE**

Research on aggregates was pursued in 2011: product performances were optimized according to their destination and certain by-products were upgraded, thus contributing to the preservation of this natural resource. The “Road” program focused its efforts on road material recycling. The aim is to reduce energy production costs and the carbon footprint of asphalts. The 2011 priority was to widen the range of Thermedia™ concretes for thermal insulation, contributing to improved energy efficiency in buildings. We have also completed our research work on new concretes with highperformance environmental characteristics such as low carbon concretes and Hydromedia™ pervious concretes, which help to better manage storm and rainwater runoff. Hydromedia™ was launched in several countries and its deployment will continue in 2012.

World-wide transfers of recent concrete innovations (Extensia™ large slabs without joints, Chronolia™ rapid-setting concrete, Agilia® self-leveling concrete, Artevia™ architectonic concretes) were pursued at a rapid pace thanks to the dedicated team of engineers and technicians and supported by the facilities in the technological building inaugurated in 2008. We are pursuing the development of our material Ductal®, belonging to the family of UHPFRC (Ultra-High

Performance Fiber Reinforced Concrete). Many job sites using this material are currently in progress.

#### **GYP SUM**

Our Gypsum research team worked more particularly on improving fundamental knowledge of water and humidity resistance of gypsum board systems and on how to make the boards lighter. They also worked on reinforcing our system offer in terms of acoustic comfort and thermal insulation in buildings.

This work resulted in a significant increase in our sales of PrégyWab™ products (gypsum boards for moisture-laden rooms and light façades) and Prégymax™ (which includes a layer of thermal-acoustic insulation allowing optimal thermal performance). It has also helped us to remain competitive on the light gypsum board market. We pursued the development of new finishing coatings to meet local market requirements and also anticipate user expectations in terms of new functionalities and innovation. Finally, part of our research work helped to continue improving gypsum production processes, thus respecting our commitments to industrial performance and reduction of the environmental impact in gypsum board production.

#### **CONSTRUCTION SYSTEMS**

Two laboratories, one in Lyon (Euromed zone) and one in Chongqing (China) dedicated to Construction Development were founded in 2011. These laboratories provide the Group with the means to accelerate innovation and the use of our products in different construction systems, while reinforcing our diversity by bringing us closer to local construction markets. These teams bring together new competencies in various domains, such as implementation and methods, thermal properties of buildings, structural calculations or construction engineering in general.

#### **Intellectual property**

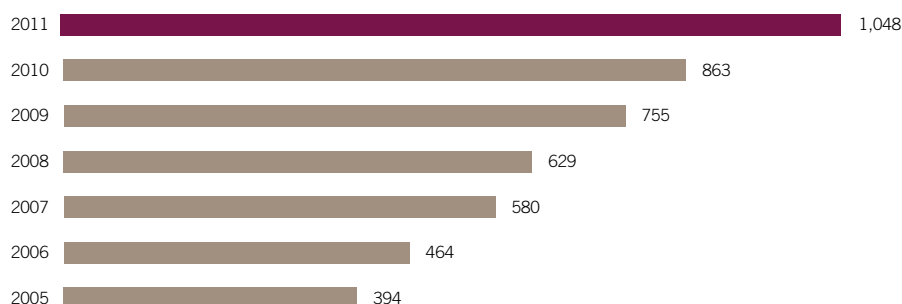
Lafarge has a substantial portfolio of intellectual property rights including patents, trademarks, domain names and registered designs, which are used as a strategic tool in the protection of its business activities. Lafarge aims to enhance the value of this intellectual property by coordinating, centralizing and establishing its titles through patents, trademarks, copyright and other relevant laws and conventions and by using legal and regulatory recourse in the event of infringement of the rights by a third party.

The Group Intellectual Property department is in charge of protecting the Group trade name, which is a registered trademark in more than 120 countries, and implementing the necessary legal recourse against third party unauthorized use of the Lafarge name. Action against illegal use of the Lafarge name and logo continued against local counterfeiters in respect to cement bags. In particular, the lawsuits initiated in 2010 continue after the seizure in 2010 in China of 100,000 counterfeited cement bags bearing the Lafarge name and logo. Investigations have also been launched in Ukraine after counterfeited cement bags were identified on the Ukrainian market. In line with the Group's focus on sustainable construction, trademark protection continues to be sought for the new slogans "Efficient Building with Lafarge™" and "Pro Eco Efficient Building avec

Lafarge™" with trademark registrations now complete in 39 countries. Global trademark protection has also been sought for the new permeable concrete product which has been launched under the name Hydromedia™.

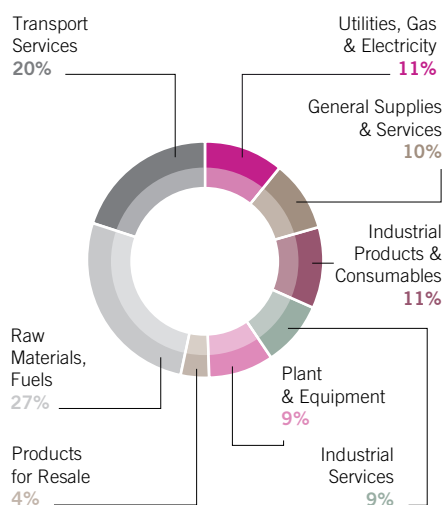
The use of, and access to, Lafarge's Intellectual Property rights are governed by the terms of license agreements granted by Lafarge S.A. to its subsidiaries. The agreements provide for a series of licenses, permitting the use of the intangible assets developed by the Group (such as know-how, trademark, trade name, patents, and best practices). The Lafarge patent portfolio continues to grow considerably, thereby reflecting Lafarge's commitment to innovation; in particular, the patent portfolio relating to the Cement, Aggregates & Concrete businesses continues to grow steadily as presented in the figure below.

#### Cumulated number of patents applied for or registered for cement and aggregates and concrete businesses



### Understanding our supply chain impacts

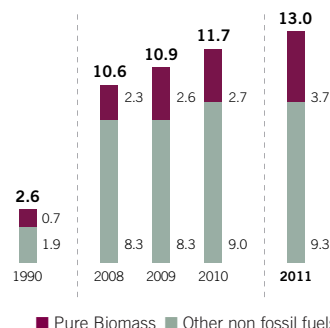
#### Breakdown of our suppliers by type



2011 once again saw high commodity inflation in many areas of the world. 38% of our purchases are related to energy.

#### Use of alternative fuels and pure biomass

(consumption of waste and pure biomass as % thermal consumption)



Our use of alternative fuel and biomass continues to increase. Pure biomass has increased over 60% in the last 4 years.

## Understanding our environmental expenses

### Increased focus on sustainability within R&D

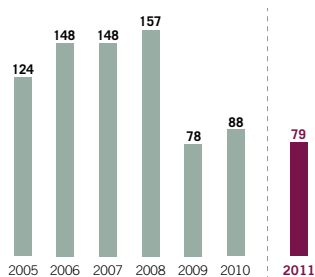
(in %)

	2009	2010	2011
Reduction of CO <sub>2</sub> emissions	16%	22%	<b>32%</b>
Energy efficiency	15%	17%	<b>23%</b>
Natural resources	8%	8%	<b>11%</b>
Safety & Security	5%	7%	<b>3%</b>
Comfort & quality of life	5%	4%	<b>9%</b>
Others	51%	42%	<b>22%</b>

More than half of R&D continues to be spent on sustainability related fields.

### Environmental and safety investment amounts committed

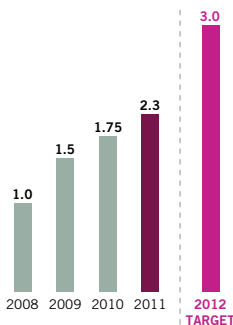
(in million euros)



The economic crisis continues to affect capital spending, but substantial expenditure on new equipment, such as dust collectors to reduce particulate emissions.

### New product sales over time

(in bn euros)

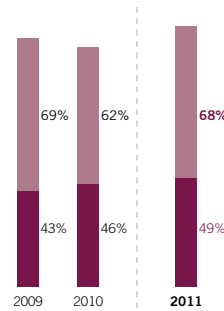


Although all sales were affected by the recession, sales of new products showed more resilience in the developed countries where they are primarily sold.

## Environmental management

### Sites covered by environmental management systems (EMS), including ISO 14001

(as % sales)

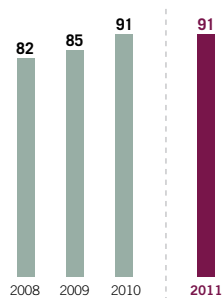


■ Covered by Lafarge internal management system and ISO certified system  
■ Covered by Lafarge internal management system

68% of sales are covered by an environmental management system and 49% use an ISO 14001 certified EMS system (68% of our cement plants). Our goal is to have 100% of our sites covered by an EMS system.

### Sites audited environmentally within the last 4 years

(in %)

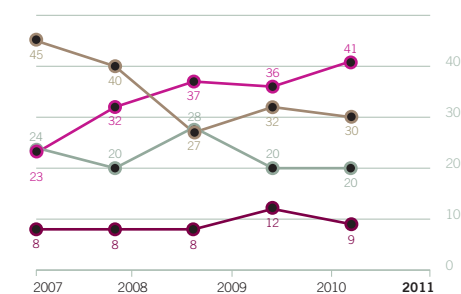


For our cement plants, all but two of our sites have been audited within the last 4 years. Our goal is to achieve 100%. The figures for the businesses are: Cement 94%, Aggregates & Concrete 88%.

## Monitoring corruption risks and human rights challenges

### Breakdown of sales by country risk according to Transparency International

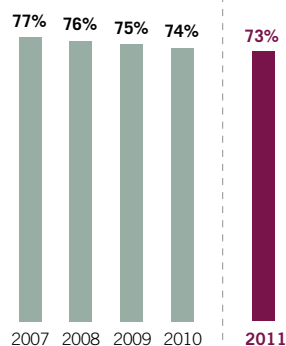
(in %)



An increasing proportion of our business is carried out in countries with higher corruption risks.

### Clinker factor

(ratio between clinker consumption and cement production calculated according to CSI Protocol)

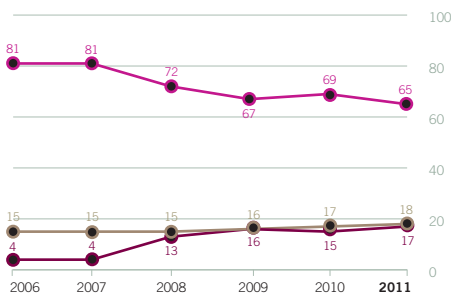


We continue to focus on lowering the clinker factor as this parameter is a strong lever to lowering CO<sub>2</sub> emissions.

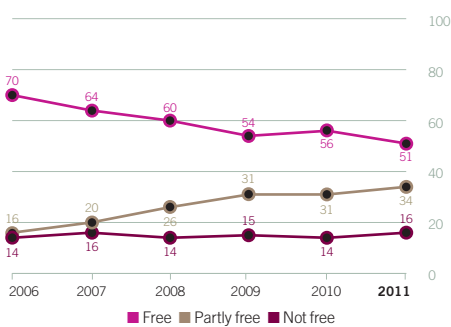
### Breakdown of activities in countries of concern regarding human rights\*

(in %)

#### Sales breakdown



#### Workforce breakdown



As a result of changing Group structure and growth, an increasing proportion of our business is conducted in countries with human rights concerns.

\* Based on Freedom House's Freedom in the World 2010 Index, which rates countries on their levels of civil and political rights.



# People development and social dialogue

In Lafarge we strongly believe that having diverse teams and an inclusive mindset represents today a real competitive advantage.

## Headcount

### Employees by Geographical Area – Employees by Business

The Group had 67,924 employees at the end of 2011, which represents a decrease of 7,753 employees compared to December 2010.

This reduction mainly reflects the change of scope of the Group as a result of divestments:

- mainly Gypsum operations in Europe, Latin America and Asia;
- part of Cement and Aggregates and Concrete operations in the United States;
- to a lesser extent, our Aggregates and Concrete operations in Portugal and Switzerland.

This reduction was partially offset by acquisitions: mainly Cement, Aggregates and Concrete operations in Hungary, Iraq, Poland and Russia.

Like for like, the headcount was reduced by 2.6% from end of 2010 to end of 2011, which represents a decrease of 1,984 employees. The change is primarily due to reorganizations in Asia, North America and Europe, which were not offset by increases in headcount in emerging countries: Algeria, Brazil, Hungary, Nigeria and Russia for example.

Both tables account for 100% of the employees of our fully consolidated and proportionately consolidated subsidiaries.

Employees by Geographical Area					
	2011			2010	
	Headcount	%	11 VS 10	Headcount	%
Western Europe	12,202	18.0%	(21.9%)	15,626	20.6%
North America	9,604	14.1%	(10.6%)	10,748	14.2%
Middle East and Africa	20,376	30.0%	8.1%	18,843	24.9%
Central and Eastern Europe	7,464	11.0%	(2.4%)	7,652	10.1%
Latin America	2,535	3.7%	(24.5%)	3,355	4.4%
Asia	15,742	23.2%	(19.1%)	19,454	25.7%
<b>Total</b>	<b>67,924</b>	<b>100%</b>	<b>(10.2%)</b>	<b>75,677</b>	<b>100%</b>

Employees by business					
	2011			2010	
	Headcount	%	11 VS 10	Headcount	%
Cement	43,392	63.9%	(1.9%)	44,253	58.5%
Aggregates and Concrete	23,242	34.2%	(0.8%)	23,438	31.0%
Others	1,289*	1.9%	(83.9%)	7,986**	10.6%
<b>Total</b>	<b>67,924</b>	<b>100%</b>	<b>(10.2%)</b>	<b>75,677</b>	<b>100%</b>

\* Including headcount of our residual Gypsum activities and Gypsum activities held for sale.

\*\* Including headcount of our Gypsum activities the majority of which was sold in 2011.

“ To benefit from diversity, an organization needs to have an inclusive environment where everyone feels respected. ”

Employment		
	2011	2010
Percentage of full-time employees	99%	99%
Percentage of part-time employees	1%	1%
Percentage of permanent employees	97%	96%
Percentage of fixed-term contract employees	3%	4%
Percent of employees aged under 30	16.1%	16.7%
Percentage of employees from 30 to 50 years	63.0%	63.3%
Percentage of employees over 50 years	20.9%	20.0%

Job evolution		
	2011	2010
Number of hirings	7,400	5,991
Number of resignations	3,770	3,752
Number of retirements	776	1,057
Number of redundancies	4,308	3,986
Number of deaths	125	142

We endeavor to limit or postpone headcount reductions, and to assist every affected employee as prescribed in our Employment Policy.

Measures to mitigate job changes		
	2011	2010
Percentage of business units having implemented significant headcount reduction impacting more than 5% of workforce	20%	28%
Of which % of business units with headcount reduction having set up an employment channel for employees	38%	58%
Of which % of business units with headcount reduction having set up a local economic development channel for local communities	14%	30%
Number of Lafarge employees re-employed outside the Group (in another company or in their own business)	305	1,393



**PANEL**  
MARION HELLMANN  
BUILDING AND WOOD WORKERS  
INTERNATIONAL

We appreciate Lafarge's approach to limit or postpone headcount reductions, and to assist every affected employee through re-employment or re-training and the creation of jobs at local level, provided Lafarge also maintains and potentially develops jobs in its own factories.

In 2011, Lafarge worked with 33,432 out-sourced contractors accounting for some 33% of the workforce (in 2010: 30%). We are aware that Lafarge's subcontracting policy does not mean distancing themselves from their responsibility to the workers and the labor practices of the subcontractors. We encourage Lafarge to continue dialogue with their suppliers and subcontractors on trade union and human rights issues.

Social Dialogue between unions and Lafarge must seek to establish a more constructive general environment for the promotion of socially responsible business and the implementation of ILO core labor standards. Lafarge's actions substantiate this policy. The number of employees covered by collective agreements has steadily increased year on year. In its next sustainability report, Lafarge should also report on the ongoing social dialogue with Global Union Federations – GUFs – such as BWI and ICEM.

## Labor organization and working conditions

### Well-being at work

Further to an initiative of the European Works Council, three additional surveys were carried out in 2011, two in Austria and one in France, to help maintain dialogue with our employees. In order to give these results a wide communication, the survey

results were debriefed both locally and with the European Works Council.

Although the overall outcome is very positive, in particular on stress-related issues, in order to keep improving well-being at work, action plans are still implemented.

Staff performance assessment		
	2011	2010
Percentage of management staff having an annual performance review	91%	94%
Percentage of non-management staff having an annual performance review	62%	64%

### Outsourcing

Outsourcing by field of activity		
	2011	2010
Production	36%	38%
Maintenance and Clearing	27%	26%
Transport	20%	19%
Security and Guarding	11%	10%
Others (IT, accounting, etc.)	6%	7%

In 2011, Lafarge worked with 33,432 out-sourced contractors accounting for some 33% of the workforce (in 2010: 30%). Many examples gathered from Business Units show that our awareness of health and safety for these people increased in 2011, whether working on our sites or outside (e.g. in transport).

## Social dialogue

### Employee representation

Employees covered by collective agreements		
	2011	2010
Health and Safety	59%	51%
Restructuring	57%	47%
Compensation and benefits	58%	52%
Others	35%	25%
Staff employees represented by staff representatives or trade union organizations	70%	67%
Business units with collective agreements	74%	71%

The number of employees covered by collective agreements has steadily increased year on year. The "Others" section includes namely employment protection and working hours.

In 2011 several new business units, most of them in emerging countries, negotiated collective agreements for the first time. In 2011 an additional 6% of business units engaged in staff representation, some through formal trade unions.

### Agreements signed in 2011 with social partners

In 2011 we signed a revision of the European Works Council Agreement with our European social partners. We also signed a joint declaration concerning Health, Safety and Hygiene.

Furthermore, many other agreements were signed locally with social partners (collective agreements, wage agreements, etc.).

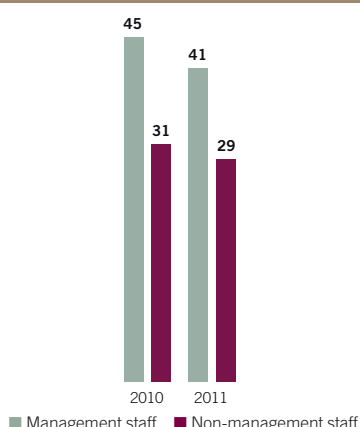
### Number of business units with strike action

There were substantially fewer strikes this year (in 9 business units compared with 14 in 2010). Of those which occurred, most were in the general context of the country (Egypt, Greece). Some social unrest was specifically linked to our operations (Algeria, France).

## Developing people

### Average number of hours of training

Average number of hours of training



Average training hours for our Employees decreased slightly in 2011, but overall still remain high. Increased emphasis is being placed towards informal on-the-job training. In addition to the formal

training program, a cultural change occurred this year with the promotion of the iLearn mindset (I Learn Everyday Acting and Reflecting with my Network). This approach gives a broader spectrum to learning, empowering the individuals to be active in their own on-the-job development, interacting with their teams, or through an increased offer of training programs catering to their specific needs.

Training naturally becomes part of everyone's job, more embedded in the business, and contributes to driving change to be closer to our markets and customer needs.

On e-learning, a 30% increase in single-users was recorded in 2011, while new Lafarge-tailored modules were released (Health and Safety, Sustainable Construction, etc.), both enriching the offer and delivering to a wider employee base.

## Diversity and inclusion

In Lafarge we strongly believe that having diverse teams and an inclusive mindset represents today a real competitive advantage.

To benefit from diversity, an organization needs to have an inclusive environment where everyone feels respected, involved and recognized. This will help us to open up to new ways of working, gain more flexibility and not to exclude anyone.

Diversity and Inclusion is therefore considered as one of the levers that will enable us to become an employer of choice specifically in emerging countries, to increase business performance and consolidate our leadership position.

Our ambition is to make a turning point in terms of diversity by addressing aspects linked to a change of mindset and behavior.

This year we promoted behavior and mindset change as a key success factor, supported by on-going communication and awareness raising, as well as changes to business and human resources processes.

Numerous local initiatives were implemented that reflect the start of change, and at the Group Level a Roadmap was designed in order to set clear targets and measure progress.

### Increasing women in senior management

	2011	2010
Boards of Directors	17.6	17.0
Senior executives and managers (Lafarge grades 18+)	15.8	13.5
Senior executives (Lafarge grades 23+)	10.8	9.9
Senior managers (Lafarge grades 18-22)	16.2	13.9
Managers (all categories)	18.8	18.7
Non-managerial staff	15.0	16.0

In 2011, the percentage of women in senior management increased significantly, which is encouraging.

## History & Context

Lafarge commitment to diversity started over 20 years ago with a strong accent and progress on the internationalization of our teams. In 1995, Lafarge Principles of Action recognized Diversity as a clear value for the Group. Over the past years our teams have become more and more diverse in terms of nationalities and this is clearly visible at senior management level.

In 2007, while publishing the Ambitions 2012, the Group set a milestone for gender diversity of 20% women in senior leadership of Lafarge to be achieved by the end of 2012.

Specific progression has been done to support this ambition:

- The number of senior female leaders progressed every year, and this is also true at TOP 200 level, including BU GM positions. (see below)

- Dedicated women O&HR review has been implemented since 2009; women having the potential to reach leader positions have been identified and followed.

- Specific HR processes have been reviewed or developed which are supporting the diversity journey: mentoring, HiPo management (high potential), employer branding.

In some countries or regions dedicated task force have been put in place for Diversity (including Diversity Champions in the US for example).

## Group Gender diversity Dashboard

KPIs	2008	2009	2010	2011 (estimate Sept.)	Target
Women High Potential	9%	13%	13.4%	21.5% *	35% +
Women grade 18+	11%	12%	13.6%	14.6%	20% +
Women grade 23+	8%	8%	9.5%	10.3%	20% +
BU Excoms with at least one woman	Not available	58%	62.9%	67% *	100%

\* w/t Gypsum new HiPo rules

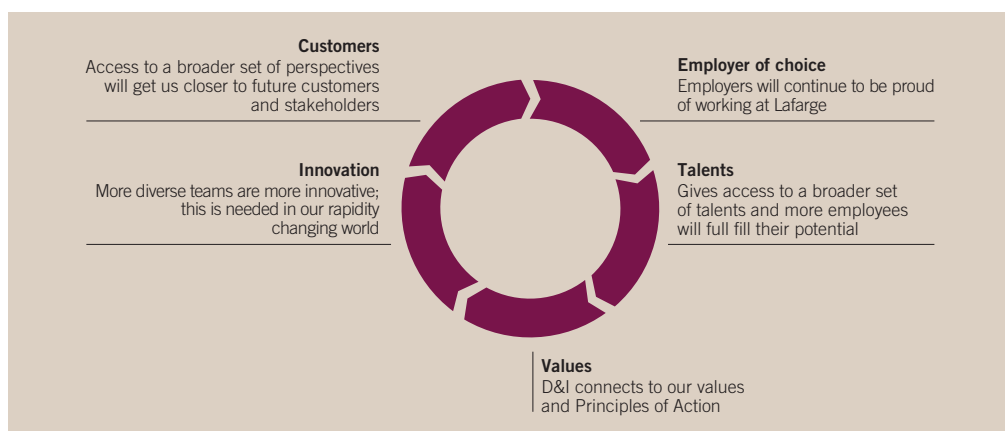
## Why Does Diversity and Inclusion matter to Lafarge?

We believe that Diversity and Inclusion will be a key enabler of our business success going forward. Both within and beyond Lafarge, there are a number of examples of how diverse teams deliver better results in the right conditions.

Furthermore, our stronger focus on Diversity and

Inclusion is supporting the Lafarge ambition of corporate social responsibility and helps mitigate potential legal risks.

There are five core drivers why we are developing a Diversity and Inclusion strategy, with an emphasis on delivering business value now and in the future.



### What do we mean by Diversity and Inclusion in Lafarge?

It is important that as an organization we have common definitions of Diversity and Inclusion.

#### GENDER:

Lafarge believes in equal treatment and chances for both men and women and wants to develop the percentage of women in the Group particularly of senior positions.

#### NATIONALITY:

In line with our focus on emerging markets and the continuous internationalization, we believe that our senior leaders shall mirror the international exposure and the business interest of Lafarge.

#### THINKING STYLES:

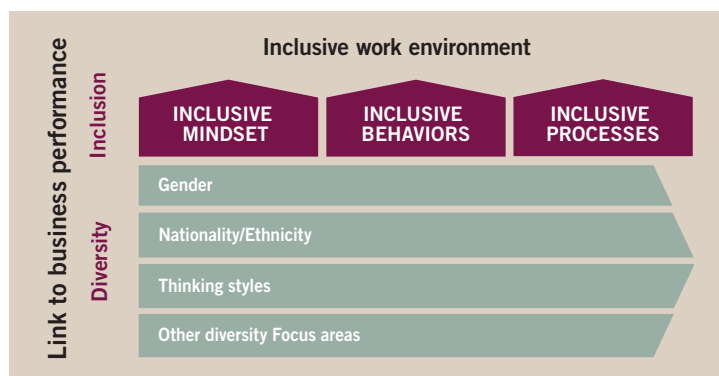
We need a broader diversity of profiles and thinking styles. A broader range of profiles will develop a more entrepreneurial, marketing-oriented culture, bringing more innovation and creativity to our industry.

#### OTHER DIVERSITY

Focus Areas: As an international leader we believe in the value of diversity in other areas as well: disability, age discrimination, sexual orientation, etc.

#### INCLUSIVE ENVIRONMENT:

In order to leverage the increasingly diverse workforce, we need to offer a more inclusive environment for each employee to achieve his/her full potential. A company that leverages a wide range of talents, thoughts and styles is a company that has more chances to be sustainable as a leader.



Diversity means a workforce with a variety of personal characteristics. This includes similarities and differences in genders, nationalities, thinking and working styles, abilities, and all the other differences that make each person unique.

Inclusion means a way of working together where all profiles and forms of diversity are bringing their unique value. This is supported by a mindset, behaviors, and processes which value differences among colleagues. Individuals with an inclusive approach create an open and safe work environment.

Through Diversity and Inclusion we aim to create an organization where people feel involved, respected, and connected so that more people with a wider range of backgrounds succeed.

## Philippines

# OFFERING CAREER SUPPORT TO ENGINEERS



Since 2004, Lafarge's Cadet Engineer program has enhanced the training of young Filipino engineers.

A follow-up program now helps them to better manage their careers.

#### OBJECTIVES

- Train young engineers in working with cement
- Encourage and help engineers to build a career in the company
- Develop and promote employee talent.

#### SUMMARY

Aimed at young engineers graduating from Filipino universities, Lafarge's Cadet Engineer Program allows them to acquire specific skills in relation to building materials.

In a continuation of this initiative, the Cement Business has established a system for helping engineers to progress and to build a career in the company.

To achieve this, two tools have been created:

The Engineer's Career Path enables young engineers to adopt a career strategy by identifying the skills they will need at each stage of their progress. Follow-up, carried out in coordination with their direct supervisors, regularly analyzes what they have learned and what they will need.

The Young Engineer Exchange Program is a knowledge-sharing system. Currently, two Filipino engineers are working in Lafarge cement plants in Malaysia, while Lafarge Philippines is hosting their counterparts. The initiative has created a real network of experts in Asia, while encouraging mobility.

#### RESULTS

These programs encourage recruitment of new talents by demonstrating that Lafarge offers real career opportunities. Since 2004, 56 cadets have taken part in the program and 40 of them have joined the company.

This first experience-sharing project in the Philippines has generated enthusiasm and many student engineers have shown interest in participating.

#### PROSPECTS

The structure put in place is very flexible. It can be adapted to other countries, as well as other Group business lines.

#### PEOPLE CONCERNED

- Lafarge engineers in the Philippines
- Cecill Sese, the subsidiary's training manager.

## Where Do We Want to Be?

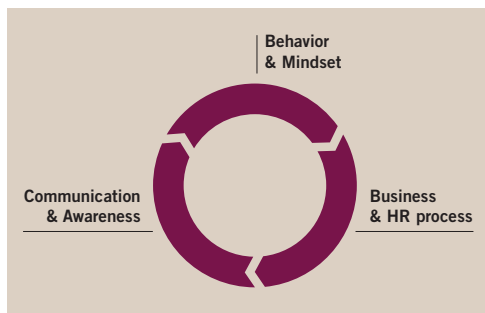
Our Lafarge vision, strategy and ambitions can only be achieved by people working together successfully. Diversity and Inclusion is a key enabler of the Group strategy.

Through Diversity and Inclusion we aim to create an organization where people feel involved, respected, and connected so that more people with a wider range of backgrounds and business styles are motivated and fulfilled, which will also make Lafarge more successful as a company.

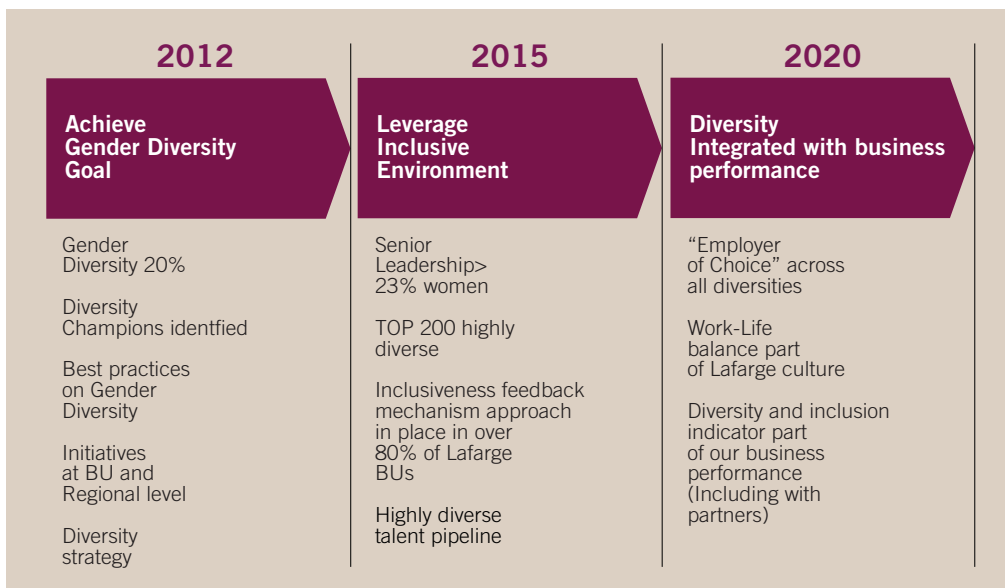
## The 3 change levers

There are 3 main levers which will enable us to deliver on our Diversity and Inclusion plan. Behaviors and mindset change are critical to our success, and each individual will have their own experience of developing a more inclusive mindset. This will be supported by on-going communication and awareness raising, as well as changes to business and HR processes. Although every employee's effort is needed, the engagement and commitment of them all is a critical success factor.

### Three change levers



### Diversity path







### PANEL ERIC BRASSART EUROPEAN WORKS COUNCIL

Health and Safety is the first priority of our Group.

The recent changes that aim to give country CEOs the possibility to define their own local Safety priorities should bring more efficiency and help reduce the number of accidents, which are still too frequent.

Our main concern remains road accidents, an area where we have made good progress but still have a long way to go to achieve the expected level of performance.

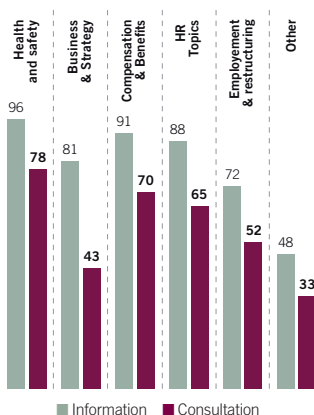
The members of the European Works Council value the quality of social dialogue that we have with management and the fact that our comments are taken into account, which are fundamental values for us. The respect for the employee representatives during the Plenary meeting of the EWC with Mr. Bruno Lafont is an important reflection of the Group's culture.

### Sixth employee share ownership plan: LEA 2011

Employee ownership is a key element of our social strategy. Our 2011 LEA share ownership plan reached a subscription rate of 44%, versus 53% in 2009. 30% of participating countries saw their subscription rate increase above their 2009 performance.

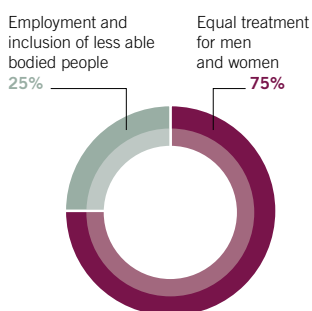
#### Information and consultation

(number of type)



Consultation on major topics is at the core of social dialog, which is implemented locally throughout the organization

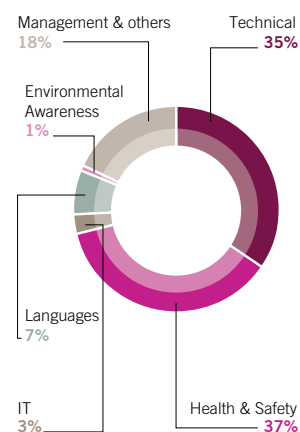
#### Equal opportunities



Measures taken in favor of (in% of BUs)

mance. We are particularly proud of the high participation rates achieved in some countries: 80% of employees subscribed in Ecuador, 90% in Romania and Cameroon, over 90% in Zimbabwe.

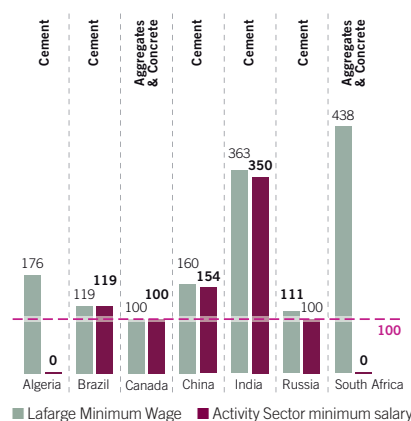
#### Lafarge investment intraining by type (%)



The focus was again on health and safety, which is the Group's priority

#### Comparative Wage Rates

Lafarge business unit minimum wage relative to sector minimum wage: index=legal minimum wage=100





## SOCIETY

**Find out about Lafarge's actions in the field, including projects involving local communities, health and preventive medicine programs, human resources policy and safety measures for employees and contractors. The most recent case studies:**

**12/09/2011 Indonesia** - Microcredit for home refurbishment  
Housing for the needy  
**09/02/2011 Zambia** - An efficient response to medical emergencies  
Health  
**07/08/2011 Philippines** - Homes for deprived communities  
Housing for the needy  
**04/12/2011 Korea** - A safety center for local communities  
Safety  
**04/05/2011 Kenya and Uganda** - Planting trees to teach children  
conservation  
Education

## EDUCATION

**Kenya and Uganda** - Planting trees to teach children conservation  
**Zimbabwe** - A community bursary scheme to help local students  
**China** - Book collection for school children  
**Greece** - Environmental education program  
**United States** - Extra-curricular program to introduce geology  
**Brazil** - Scholarships with Lafarge College  
**Germany** - Agreement between cement plants and local schools  
**Romania** - Support for a professional school  
**China** - "Love the Earth Ambassador" campaign  
**Kenya** - Green Schools project  
**Malaysia** - Scholarships and Excellence Awards  
**Greece** - Students' scholarships on the island of Nissiros

## INFRASTRUCTURES

**China** - Anti-seismic plasterboard system for school reconstruction  
**Nigeria** - Sagamu IT Learning Center restoration  
**Thailand** - Renovation of Roomo village's kindergarten school  
**Thailand** - Renovation of the Darika Muslim school  
**France** - Restoration of La Couronne Abbey  
**Indonesia** - Renovation of Charoenrat Temple  
**Sri Lanka** - Development of hospital facilities for underprivileged people  
**Bangladesh** - Social care from Lafarge Surma Cement  
**Brazil** - Water for Glauclandia

## HOUSING FOR THE NEEDY

**Indonesia** - Microcredit for home refurbishment  
**Philippines** - Homes for deprived communities  
**South Korea** - Lafarge and Habitat for Humanity celebrate their 10<sup>th</sup> anniversary  
**Honduras** - Partnership with Habitat for Humanity  
**Venezuela** - Care center for the needy and the homeless  
**Romania** - Lafarge & Habitat for Humanity  
**UK** - "Sweat Equity"  
**South Korea** - "Love in Action" project  
**USA** - "Jimmy Carter Work" project  
**UK** - "CRASH"  
**South Africa** - Eco-City, an ecologically sustainable village in Johannesburg  
**South Africa** - Eco-City in a Johannesburg township

## AID AFTER A NATURAL DISASTER

**Romania** - A partnership for the reconstruction of 30 homes  
**Pakistan** - Helping victims after the 2010 summer floods  
**Moldova** - Cement donated to rebuild housing and infrastructure  
**India** - Donation following cyclone Aila  
**China** - Emergency aid and reconstruction following an earthquake  
**Honduras** - Donation following Hurricane Mitch  
**Sri Lanka** - Donation following floods  
**Germany** - Help to rebuild Rade village after the floods of summer 2002  
**Turkey** - Aid after an earthquake

## CHILD PROTECTION

**UK** - CHaMPS and missing persons  
**UK** - Building a BMX track  
**Mauritius Island** - Craft Academy  
**Philippines** - Urchins-Street Kids Association project  
**Asia** - Support for Children's aid mission  
**Malaysia** - Visit to a child protection orphanage  
**Sri Lanka** - Projects for orphanage developments  
**Russia** - To bring support to the Malichok orphanage  
**China** - Langfang Children's Village

## HERITAGE PROTECTION

**Iraq** - Renovation of the Erbil Citadel  
**United States/France** - The RMHF grant for heritage architects  
**France** - Renovation of Eileen Gray's Villa E1027  
**France** - Highlighting archaeological discoveries  
**Brazil** - Restoration of Ballet Cavern  
**Romania** - Lafarge and the restoration of national heritage buildings  
**Turkey** - Istanbul is as nice as my home  
**Italy** - The "Colors project", the Environmental reclamation project  
**China** - The giant panda, a species to protect  
**Turkey** - The Lafarge Memorial Forest project  
**South Korea** - The Baekdudaegan conservation project  
**UK** - Preserving a prehistoric fossil  
**France** - Blending into the cityscape  
**China** - Conserving ancient kilns  
**Chile** - Mural painting

## HEALTH

**Ecuador** - The first partnership with CARE  
**Zambia** - An efficient response to medical emergencies  
**Benin** - Ensuring long-term future of fighting HIV/AIDS, malaria, tuberculosis  
**Russia** - Children's polyclinic reopening  
**Benin** - Malaria prevention program  
**South Africa** - Prevention and treatment of HIV/AIDS  
**China** - HIV/AIDS prevention program  
**Mauritius** - A diabetes treatment center  
**Zimbabwe** - Active measures to fight cholera outbreak  
**Uganda** - Fighting malaria with ambitions  
**Malawi** - Malaria prevention program  
**Romania** - The prevention and diagnosis of cancer  
**Poland** - Donation of a bronchoscope to the Voivodship Children's Hospital  
**India** - Eye hospital and mobile dispensaries for the communities  
**Indonesia** - The Lafarge Mobile Clinic  
**Zambia** - Program of prevention and care for H.I.V./A.I.D.S.  
**Kenya** - Voluntary counselling and testing services at the Bamburi staff clinic

## SAFETY

**Korea** - A safety center for local communities  
**China** - Integrating Lafarge safety culture  
**South Korea** - Improving accident risk management  
**India** - Management of subcontractor safety  
**Greece** - Improving road safety using onboard GPS  
**Middle East** - A subcontractor follows Lafarge's example  
**East Africa** - Driving for excellence  
**North America** - Safety information and training for all  
**Global** - Safety for all new employees  
**Global** - Truck drivers and safety  
**Mexico** - An exemplary worksite: safety at the Tula plant  
**Korea** - A prize for best safety management  
**Romania** - Action Plan  
**Global** - Health and security Concerns relating to Alternative Fuels

## SUPPORT FOR SPORTING AND CULTURAL ACTIVITIES

**Brazil** - Le Corbusier exhibition in Brazil for the French Year  
**Austria** - Fund-raising initiative  
**South Korea** - Funding of an in-line roller skating team  
**China** - Tang Kou Fitness Center for the elderly  
**South Korea** - Fitness center and public baths for the local community

# Health and Safety

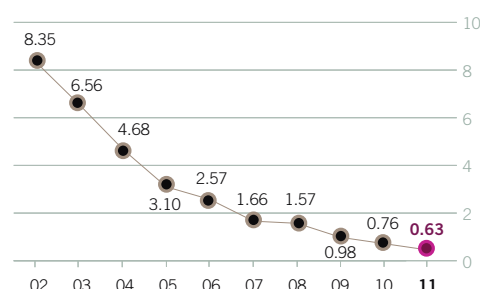
Lafarge's objective is to reach zero incidents over the long-term and across all the units, with contractors working to the same standards as employees. Moreover, Lafarge wants to be recognized by NGOs and the business community as a world leader in safety.

## Safety results

Lafarge has continued to make progress in the Lost-time Incidents Frequency Rate (LTIFR) since the inception of its Health and Safety journey. Since 2010 we have started to track the LTIFR for contractors on site however there is no baseline before 2010. A LTIFR is the number of lost time injuries per one million work hours.

### Reduction of Employee LTIFR

(lost time injury frequency rate: number of accidents leading to loss of time by million hours worked)



For 2011, contractor on site LTIFR is 0.58 vs. 0.94 recorded in 2010.

This improvement was achieved by having management teams at all levels focus on Health and Safety and implement clear worldwide standards and advisories throughout the Group.

Unfortunately, Lafarge still has too many fatalities and cannot be satisfied until they have all been eliminated. However, the overall number of fatalities has decreased in 2011 vs 2010, mostly as a result of a decrease in transport fatalities.

In 2011, Lafarge had thirteen fatalities on our operating sites. To avoid future fatalities, the Group is producing "Key Learnings" for each fatal incident that are shared within every operation. The main takeaway from the learnings of these on-site incidents is that insufficient management time in the field to understand the risks involved in performing a task, a lack of understanding of the risks by the employees doing the task, changes in process not sufficiently taking into account Health and Safety and a lack of learning from each other are all key components that can lead to serious incidents.

The Group also had fourteen road accident fatalities in 2011. The Group is working on implementing two Advisories launched at the end of 2010 on transportation: one for people and one for loads. There is progress in transport safety as many operations worked hard to start implementing these Advisories. This will imply a change in strategic direction in the way Lafarge contracts transport in the future. As a comparison, in 2010 the Group had thirty road fatalities.

Three third party fatalities on customer job sites where Lafarge was delivering concrete and three fatalities on construction projects in China are also to be deplored.

Lafarge is convinced that all these tragic events could have been avoided by training all employees in risk assessment, by pushing everyone to think Health and Safety first and embedding Health and Safety in all our processes. Lafarge is currently working on this.

For the fourth year in a row, June Health and Safety Month was an opportunity to engage all personnel at every site and in every function, to make a step change improvement in awareness, behavior and Health and Safety performance.

Recognizing and celebrating successes are always a part of Health and Safety Month, as well as engagement with families, customers, contractors and local stakeholders. The Group theme for 2011 was transport, covering anything linked to the movement of vehicles, equipment, people including pedestrians on-site and off-site.

Risk assessment will be the theme of the Health and Safety month in 2012 as it is one of the major methods for reducing incidents.



## PANEL FRANK ROSE INDEPENDENT

The reduction in lost time injuries of employees and contractors in 2011 is welcomed and continues the established trend for employees, but this must be viewed in conjunction with the number of fatalities. Whilst the overall number of fatalities has been reduced, the number of on-site fatalities for employees and contractors is of particular concern and indicates that Health and Safety standards are not consistently implemented throughout all Lafarge's operations.

The planned 2012 focus on Risk Assessment is appropriate. However, rigorous attention to compliance with standards and much greater use of leading indicators to target improvement priorities will be needed to eliminate fatalities from Lafarge operations.

The Occupational Health strategy is being implemented and Lafarge is strongly supported to deliver this ahead of plan wherever possible to ensure that protection of the health of employees and contractors meets contemporary good practice globally.

## Lost time injuries and fatalities

	2011	2010
Number of lost time injuries among Lafarge employees	93	120
Number of lost time injuries among contractor employees	63	111
Lafarge employee fatalities - on site	8	1
Lafarge employee fatalities - transport	0	7
Lafarge employee fatalities - customer job sites	0	1
Contractor employee fatalities - on site	5	8
Contractor employee fatalities - transport	10	14
Contractor employee fatalities - customer job sites	0	2
Contractor employee fatalities - project sites	2	0
Third-Party fatalities (customer job sites, transport)	9	11
Lafarge employee fatality rate (number of fatal accidents per 10,000)	1.11	1.18

Since 2010, we have included fatalities of persons traveling to or from a non-home location or operational site or when transport is provided.

## Preparing the future

Lafarge's Health and Safety Management System (HSMS) was issued in 2010. It is Lafarge's belief that the full and successful implementation of the HSMS elements will enable the Group to achieve world class H&S performance.

In line with the HSMS, the Group is moving to a Risk Based Approach.

The business units will assess their risks, prioritize them and then address them to comply with the Group Standards and Advisories. This move is an evolution from the current state, giving more responsibility to line managers and having them manage Health and Safety from an operational standpoint. To further this approach, Lafarge has recently launched several tools to support the business units: a Governance Standard on Risk Management providing the Group expectation on how to analyze and control risks, a HSMS Self-Assessment Maturity Tool to help the business units understand their current state vs the Group expectation and a H&S Group Entity Audit. This H&S Entity Audit is expected to harmonize the Health and Safety Audits within the Group and involves line management across all product lines.

The operations continue to implement Standards and Advisories already launched according to a set schedule.

## Providing a healthy environment for our employees

Lafarge has developed a Health strategy supporting its goal of providing a healthy work environment and preventing occupational illness.

Lafarge's approach is to not only consider the effects of work on health but also the effects of health on work. This holistic approach is illustrated by a Health strategy predicated on the three pillars of Prevention, Reintegration and Promotion.

A protocol for Health Assessment (HASOP) has been developed and its implementation has started across the Group ensuring that all employees have a standardized approach to risk-based medicals. This protocol will ensure that the relevant occupational and personal health risks which can have impact on Health and Safety at work are identified and managed. All countries are expected to finish their implementation by the end of 2014.

As part of the Risk Management Standard, the health aspect was piloted in several business units. The key findings of the pilots are: a large amount of remediation actions can be taken by managing with little or no capital expenditure, the Group faces the same three top risks at most plants (noise, dust and ergonomics), there is a lack of internal health expertise and availability of external health resources, and lastly, the process is more resource intensive than planned due to a lack of data from previous assessments as most business units are addressing these risks for the first time and there are other competing operational priorities.

Lafarge is currently working on defining new Group Health Standards to address the following risks: noise, dust including respirable silica, ergonomics, hand and arm vibration, whole body vibration, alternative fuels and raw materials, working in extreme temperatures, chemical agents and biological agents. The intent through these Standards is to ensure that the main occupational health risks linked

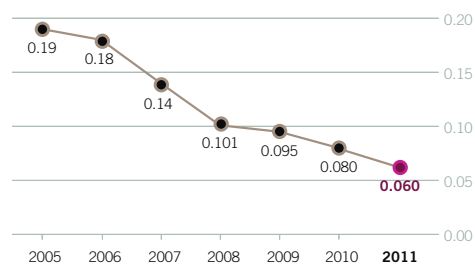
to Lafarge's operations are effectively controlled. The requirements of the Risk Management Standard and the risk based approach to implementation of these specific Health Standards will be phased in as determined by a prioritization process. The implementation phase is expected to be a few years.

Lafarge is working on the development of leading indicators for measuring our Health performance since lagging indicators do not reflect current risk management. The establishment of baseline exposure characteristics as required by the Risk Management and Health Standards will enable management to track and improve control measures; and at the same time ensure that we meet our ambition to prevent occupational disease.

## Days lost over 7 years

### Days lost over seven years

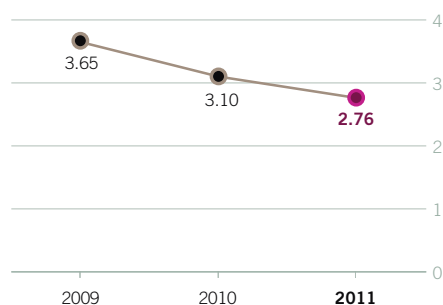
(lost time injury severity rate: number of calendar days lost as a result of accidents by thousand hours worked)



Although our standards and advisories are rolled-out as soon as an acquisition takes place, we allow a period of two years for acquisitions to catch up with the full implementation of these health and safety standards and advisories. For a period of two years, lost time injuries for employees and contractors are not counted. The injury severity rate was 0.080 for Cement, 0.086 for Aggregates & Concrete and 0.088 for Gypsum.

### TIFR

(total number of injuries requiring professional medical attention per 1 million hours worked)  
Lafarge Employees



## Tanzania

# HEALTH AND SAFETY WITHIN LAFARGE



### ENSURING A HEALTHY WORKING ENVIRONMENT

As part of its ambition to provide every employee worldwide with the same access to health assessments, **Lafarge has developed a standard operational procedure (SOP)**, which includes **additional examinations** for employees exposed to specific risks (working at height, etc.). This procedure is a key element of the strategic Health Roadmap. These assessments must be standardized for all employees and established in all countries where the Group is present by 2015.

#### An example in Tanzania

In Tanzania, 22 jobs were analyzed by the BU to determine the hazards and level of risk they present to the employees who are exposed. Medical criteria were listed for each job to ensure that workers are fit for work and any underlying health conditions were not worsened. Out of around 40 risks identified at the site, 7 were then subject to in-depth analysis: dust, noise, ergonomic issues (lifting and handling work), lighting, welding fumes, vibrations... and mosquitoes!

### SUPPORTING EMPLOYEES IN THE CASE OF INCIDENTS OR ILLNESSES

In order to respond effectively to an incident, every Unit must have a **procedure in case of medical emergencies**, regularly updated and known by everyone. This means that first aid, contacting the emergency services and transport to the closest hospital are all optimized in order to minimize complications of the injury to the casualty. The Group puts in place all means available to facilitate the return to work.





## Egypt

# AN EDUCATIONAL CAMPAIGN FOR ROAD SAFETY

**As human errors account for 68% of total car accidents in Egypt, Lafarge decided to educate school children on road safety by launching in 2011 an educational campaign based on human attitudes.**

### OBJECTIVES

- Educate school children on road safety
- Address drivers' attitude issues to raise awareness on the reasons for car accidents
- Prepare qualified future drivers.

### SUMMARY

Lafarge Egypt has emphasized the need for a long term road safety strategy in a country that suffers from car accidents by launching a road safety educational campaign targeting school children.

The road safety campaign was launched in two phases. The first phase consisted in the creation of a daily TV cartoon series under the name of "Essam & Genie". The program dedicated one minute to illustrate different road safety tips, explaining the dangers and raising awareness on the basics of road safety - mainly good manners on the road - in order to start shaping the right attitude. The 60-second TV spot was aired daily on the key TV channels on prime time during the holy month of Ramadan.

The second part of the campaign relied on the launch of a project in partnership with a local NGO (the Egyptian Association for Roads Traffic Victims (EARTV)) aimed at raising awareness on road safety among students of elementary schools in Egypt. The TV cartoon has been used in the school campaign to capitalize on its popularity and success.

### RESULTS

The cartoon series was a success, recording high audience ratings.

Fans of the key cartoon character created groups on Facebook in response to the story presented.

In recognition for this campaign, the National Center for Culture and Innovation, a subsidiary of the Egyptian Ministry of Culture, named the Lafarge series "Essam & Genie" as the best cartoon idea for 2011.

The project has so far qualified 300 teachers for raising awareness of 3,000 students in 26 schools in Cairo and Alexandria. A number of workshops have already been conducted to educate children on traffic rules, ethics and regulations.

Lafarge is now standing as the sponsor of Road Safety in Egypt.

### PROSPECTS

Based on the success of the cartoon series, another campaign has been developed with the Ministry of Education to share road safety with school children.

### TOTAL COST

Total cost for the two projects was €120,000.

### PEOPLE CONCERNED

- Lafarge Egypt
- School children between 6 to 10 years old
- Ministry of Education.

## Web

### HEALTH

- Zambia** - An efficient response to medical emergencies
- Benin** - Ensuring long-term future of fighting HIV/AIDS, malaria, tuberculosis
- Russia** - Reopening of a children's polyclinic
- Benin** - Malaria prevention program
- South Africa** - Prevention and treatment of HIV/AIDS
- China** - HIV/AIDS prevention program
- Mauritius** - A diabetes treatment center
- Zimbabwe** - Active measures to fight cholera outbreak
- Uganda** - Fighting malaria with ambitions
- Malawi** - Malaria prevention program
- Romania** - The prevention and diagnosis of cancer
- Poland** - Donation of a bronchoscope to the Voivodship Children's Hospital
- India** - Eye hospital and mobile dispensaries for the communities
- Indonesia** - The Lafarge Mobile Clinic
- Zambia** - Program of prevention and care for H.I.V./A.I.D.S.
- Kenya** - Voluntary counselling and testing services at the Bamburi staff clinic

### SAFETY

- Korea** - A safety center for local communities
- China** - Integrating Lafarge safety culture
- South Korea** - Improving accident risk management
- India** - Management of subcontractor safety
- Greece** - Improving road safety using onboard GPS
- Middle East** - A subcontractor follows Lafarge's example
- East Africa** - Driving for excellence
- North America** - Safety information and training for all
- Global** - Safety for all new employees
- Global** - Truck drivers and safety
- Mexico** - An exemplary worksite: safety at the Tula plant
- Korea** - A prize for best safety management
- Romania** - Action Plan
- Global** - Health and security concerns relating to Alternative Fuels

# Communities

A key area of Lafarge's methodology is to ensure that our sites engage in effective programs with their communities.

Lafarge has a methodology for sites to engage with its communities, to drive maximum benefit from this engagement for both the company and the communities. This methodology ensures that any engagement is planned and emphasizes the importance of dialogue and feedback with stakeholders, including representatives of surrounding communities. This approach is vital in helping our sites co-exist with their neighbors in a constructive manner, during day-to-day operations and periods of change.

For Lafarge's 2012 Ambitions, agreed with the Group's Stakeholder Panel, the priority was placed on ensuring that the key drivers on stakeholder engagement were trained on this methodology to help drive positive and meaningful community interaction. The key drivers for Lafarge are defined as Plant Managers in Cement Division and Area/Regional/Business Unit Managers in the Aggregates and Concrete (A&C) Division (the job title for this role varies across countries, although in most cases, refers to the post to which site managers report).

Training on the tools and techniques to engage with stakeholders and communities effectively is delivered through internal professional development programs and workshops commissioned by countries, which are run and facilitated by Lafarge's dedicated team on the topic, along with members of the Group and country environment and communications teams.

It can be seen that, currently, 80% of all A&C Area/Regional Managers and 76% of Cement Plant Managers have participated in training on stakeholders. For A&C, this is an improvement on the figure reported in 2009, 22% (no figure was reported for 2010 due to organizational realignment undertaken during that year). For Cement, there is a slight decrease from last year's reporting (81%), reflecting changes of managers of cement plants.

The effectiveness of this training is measured through two outputs: the number of sites developing local action plans for engaging with their stakeholders and sites meeting regularly with their communities. These were identified to demonstrate that both planning and dialogue were involved when activities are launched in this area.

**“It is important that our sites co-exist with their neighbors in a constructive manner, during periods of continuity and periods of change or development.”**

This year's results reflect the trend that would be expected: Aggregates and Cement operations typically have larger footprints and remain in the same location for the long term so would be expected to have these mechanisms in place. This can be contrasted with Concrete and Asphalt operations, whose operational footprints are usually smaller and who can be mobile as well as fixed in their locations. Nevertheless, it is clear that work will be required in 2012 in developing tools that will help sites in the A&C activity plan their actions more effectively,

Indicators	Aggregates	Concrete	Asphalt	Cement
Number of target population (regional & area managers) who have been trained on the Group stakeholder methodology <sup>(1)</sup>	80%			76%
Number of sites that organize regular meetings with their stakeholders/local communities <sup>(2)</sup>	79%	3%	18%	88%
Number of sites with an annual local action plan detailing planned stakeholder engagement <sup>(3)</sup>	32%	2%	8%	69%

(1) Trained on stakeholder engagement would mean that engagement with stakeholders is part of the site's annual plan (and documented) and that there is some awareness of the Group's four-step methodology on stakeholder management. Although training on stakeholder engagement takes place for Asphalt units, this particular data cannot currently be verified.

(2) Meetings refers to sites that are proactively arranging to meet stakeholders. Meetings can vary from individual meetings to liaison committees and open door events at the site. Regular would be defined as at least 2 meetings with stakeholders proactively organized per year.

(3) A documented plan detailed planned actions for engaging with stakeholders in the following period (at least 6 months).





**PANEL**  
**PHILIPPE LÉVÊQUE**  
**CARE**

In 2009 and 2010, I underlined in my comments the need for Lafarge to have both strategic and pragmatic commitments towards the communities living around its sites. A relationship of trust and a long-term mutual understanding are the key milestones to ensure the sustainable development of Lafarge and its communities. Once again, I want to reaffirm this point in 2011: While Lafarge is keen to assert its determination to improve its environmental, social and economic impacts, it should also demonstrate that it is practically achieved, by presenting structured, integrated and efficient local actions plans.

The actions presented in previous sustainability reports, as well as in this one, set on an equal footing well-established initiatives and very new ones, projects having the capacity to bring major positive changes and much more anecdotic ones: I wish to find more consistency and legibility.

However, I appreciated reading in this document a transparent report about the tensions around the sites of Himachal Pradesh and Banda Aceh.

Starting today, Lafarge has to ensure that there are enough resources allocated to the achievement of the 2020 Ambitions: In my point of view, the current budgets allocated to local development programs are insufficient and the frequency of the review of their relevance is too low.

As a committed partner, Care France will particularly watch out for the implementation of Lafarge's societal commitments, which are so fundamental for all the stakeholders.

## “More than 1,330 community programs were reported by Lafarge sites in 2011.”

alongside helping operations in concrete and asphalt develop mechanisms to engage with their communities more regularly (in the context of doing so on a short-term basis).

It is also important to note that the Group's methodology and training also encourages other ways to engage with stakeholders, in addition to the KPIs noted. These include open door events (undertaken by 60% of sites in 2011) and media relations (53% of sites sent proactive news releases in the last 12 months). An update on progress in the key areas of community programs and partnerships is detailed below. During 2011, 44% of sites reported difficult relations or even conflict with one or more local stakeholders, which is consistent with the level recorded for 2010. Examples of these types of situations drawn from Slovenia, India and the United States, are available on the Lafarge website.

### Community programs and partnerships

A key area of Lafarge's methodology is to ensure that our sites engage in effective programs with their communities. Toolkits and guidance are provided to the sites to help them develop dialogue and involve their local communities in developing long-term programs that address the needs of both the area and the company. (When addressing the needs of the company, examples could include schemes that help develop the skills and experience of the local Lafarge team as well as programs that address key issues at the site, such as visual impact).

It has been calculated that, for 2011, over 20 million euros were spent on community actions and programs (this figure does not include the financial element of programs developed at Group level). To put into context: data reported by sites showed that financial resources dedicated to this work ranged across a wide spectrum (from 0 to 782,000 euros) although Lafarge's approach in this area aims for sites to balance financial support with non-financial support (which could include employee volunteering, donation of product and loans of key equipment).

More than 1,330 community programs were reported by Lafarge sites in 2011. Notable examples highlighted include: providing drinkable water to the community (Algeria and Indonesia), supporting community-owned transport company (Ecuador), biodiversity and safety educational project (Greece), alongside long running initiatives, such as public health programs in South Africa, Uganda and Zambia.

To ensure that these programs are effective, KPIs can be developed to evaluate progress. Aggregates and Concrete units in West USA have developed a measurement tool that identifies specific financial and non-financial contributions provided towards programs, which allows the region to benchmark performance in this area and review and evaluate future partnerships and contributions.

In 2012, the Group's policies and tools will be reviewed to ensure the Group's effectiveness in this field.

### Working in partnership

Lafarge maintains partnerships with WWF International and CARE France. Lafarge's work with CARE France has particularly focused on understanding societal's long-term interests through the joint development of a tool to measure sites' socio-economic footprints. This footprint tool allows a site to understand its interdependencies with surrounding areas and track the progress of its activities in this field. During 2011, the tool was tested by four sites; in 2012, it is intended that the tool will be widely used by sites across the Group.

Lafarge is also engaging in other types of partnerships to help it evolve its approach and rethink the way it can interact with other organizations. An example of new ways to participate in local partnerships can be seen in China: the company's CEO participates in the advisory council for the Mayor of Chongqing and the local unit is a member of the 'Green Chongqing' initiative.

These initiatives have been developed by the local government to help the city, which is the world's most populous, to meet the demand for housing, building and infrastructure in a sustainable manner. To facilitate its work in helping the city achieve these ambitions, Lafarge opened its first regional R&D lab in Chongqing in 2011, dedicated to promoting sustainable construction methods, to work alongside the Group's worldwide R&D centre in France.

Numerous other examples of partnerships at a local level include: working in partnership with other material manufacturers to develop construction solutions adapted for more extreme climates (for example, in Russia); developing facilities with local energy companies to allow excess onsite power generated to be supplied elsewhere (Nigeria) and; partnering with public and specialized waste companies to process waste into a fuel that can be used in the power generation or cement manufacturing process (worldwide).



## Indonesia

# SUPPORTING LOCAL ECONOMY THROUGH MICROCREDITS

As part of its work to help local communities, Lafarge in Indonesia is supporting local small companies with their financing projects through a system of microcredits.

### OBJECTIVES

- To support the local economy through the financing of microcredits for small companies in the district of Lhoknga, a region devastated by the 2004 tsunami
- To assist project coordinators in order to help them ensure the long-term future of their business
- To establish a system of economic development rather than simply funding local communities through donations.

### SUMMARY

In the region of Lhoknga, in the north west of the island of Sumatra and home to the Aceh cement plant, the local economic fabric is mostly made up of very small companies without the means to obtain credit and are in a very precarious situation regarding the future. Lafarge therefore took the initiative of setting up a partnership agreement with a local microcredit organization to offer loans at very low interest rates with the condition that the money is reinvested in initiatives benefiting the local economy.

Lafarge also offers support optimizing the use of funds and a training program in company management.

### RESULTS

The program, which was launched in 2010, has injected nearly €40,000 into the local economy. In the first six months, 76 applications were successful, representing a total amount of €500.

### PROSPECTS

Lafarge is pursuing the program in 2011. The agreement has been specifically designed for the sectors with the most difficulty: small resellers, gardeners, craftspeople, service providers and cattle farmers. It seems that 80% of successful applications were made by female entrepreneurs, thereby bringing additional income into the family.

### TOTAL COST

Lafarge's total investment in the program is €30,000.

### PEOPLE CONCERNED

- Small independent workers who contribute to the local economy
- the credit institution which receives the guaranty of a well-known industrial company
- cement plant employees who take part in training initiatives
- local authorities who support the initiative aimed at the most vulnerable entrepreneurs.

## Spain

# SUPPORTING SMES' INNOVATIVE AND SUSTAINABLE IDEAS



Lafarge Cementos developed a business contest project "Ponemos la primera piedra" (We lay the foundation stone) open to small companies from the region near the Sagunto plant, in Spain.

### OBJECTIVES

- Contribute to sustainable development of this region
- Support entrepreneurs and small companies in the area of Camp de Morvedre (area around the plant including Sagunto).

### SUMMARY

Ponemos la primera piedra (We lay the foundation stone) is an award developed by Lafarge Cementos in 2010. It is open to entrepreneurs and small companies of Camp de Morvedre, the area located near the Sagunto plant. The only requirement needed to compete is to have an innovative, sustainable and responsible business idea. The winner is granted a €10,000, plus training and administrative support.

Lafarge Cementos is getting support and cooperation from local authorities as well as academic, social and business stakeholders, as members of the jury.

Web 2.0 plays an important role to provide small entrepreneurs and companies with information about the contest, the entry conditions, the business plan form for proposals, as well as useful links and contact data. A blog allows them to receive updated information. The social networks, such as Twitter, Facebook and LinkedIn are also used to keep in touch with the competitors and interested internet-users.

### RESULTS

The award has allowed the plant to strengthen its relationship with main stakeholders. For instance, major unions and WWF quickly accepted to join as members of the jury.

### PROSPECTS

After the first edition in 2010, Ponemos la primera piedra runs for a second edition in 2011.

### TOTAL COST

Lafarge's total investment in the program is €30,000.

### PEOPLE CONCERNED

- Lafarge Cementos
- Town Council of Sagunto
- Local University Jaime I
- Local employers association Asociación de Empresarios del Camp de Morvedre (ASECAM)
- Spanish unions UGT and CC.OO
- WWF.



## Ecuador

# THE FIRST PARTNERSHIP WITH CARE

Lafarge has signed a partnership in Ecuador with the NGO CARE to raise awareness among pregnant women of risks associated with pregnancy.

### OBJECTIVES

- To inform women and raise their awareness of the risks and possible complications of pregnancy • To train the “Quinde” community in preventive care and educate them about subjects such as nutrition, hygiene and family planning • To facilitate access to healthcare services • To contribute to a general improvement in communities’ quality of life.

### SUMMARY

In Ecuador, giving birth at home is common practice, especially within rural and indigenous communities, which are often reticent about hospitals. Unfortunately, this practice is not without its risks and the mortality rate among pregnant women and newborns has been rising steadily for several years.

As a continuation of the preventive health initiatives launched by Lafarge in the country, in December 2011 the Group signed its first partnership with CARE. The two partners are working together on developing a program to raise awareness of the risks relating to pregnancy. Designed mainly for three “Quinde” communities living around the Lafarge Selva Alegre quarry, this program concerns nearly 100 families with difficult access to healthcare services due to their isolated geographical location.

### RESULTS

The partnership is in its early stages but the program has already received a very warm welcome from participants. So far, around 80 women (including some teenagers) have taken part in workshops and awareness-raising activities.

### PROSPECTS

The work undertaken by Lafarge and CARE is in line with the objectives of the Ecuadorian government which aims, by 2013, to:

- Reduce the mortality rate among pregnant women and newborns by 35% • Reduce the number of teenage pregnancies by 25% • Increase births in healthcare establishments by 70%.

### PEOPLE CONCERNED

- Women and teenage girls in “Quinde” communities • Lafarge in Ecuador • The ONG CARE in Ecuador.

## Mauritius

# FIGHTING YOUTH UNEMPLOYMENT



On the island of Mauritius, Lafarge has set up a training course in bricklaying which - due to its success - has been adopted in full by the Ministry for Social Integration.

### OBJECTIVES

- Develop the skills of young unemployed people with no qualifications • Help construction companies experiencing a shortage of sufficiently trained bricklayers • Promote safety rules and the quality of Lafarge products to the trainees and recruiters • Promote local development, in the context of the Group's Social and Environmental Responsibility policy.

### SUMMARY

Lafarge decided to set up a training program in bricklaying to tackle the recurrent recruitment problems encountered by construction companies in Mauritius. Aimed at young jobseekers with no qualifications, the chosen module lasts for three months and includes work experience with contractors.

The theory lessons are provided by trainers from the Mauritian Training and Development Institute. The safety aspect, Lafarge's number one priority, is covered by Lafarge's HR and H&S manager. The training is validated by a professional certificate, recognized in Mauritius and abroad.

### RESULTS

The 20 trainees found jobs immediately following the first course. The initiative was welcomed by the Ministry for Social Integration, which committed to pursuing and funding the program, while retaining the format and approach of the original Lafarge project.

With this initiative, the Group has demonstrated the important role a private company can play in terms of local development and raising awareness among the relevant authorities.

### PEOPLE CONCERNED

- Young job-seekers • The Mauritian Training and Development Institute • The Ministry for Social Integration • Local construction companies.



## Honduras

# A LOCAL STAKEHOLDERS' PANEL

In order to ensure the transparency of its sustainable development reporting, Lafarge in Honduras has formed its own stakeholders' panel – an initiative inspired by the Group.

### OBJECTIVES

- To benefit from a critical perspective on Lafarge's social responsibility in Honduras
- To define Lafarge's priorities in terms of social responsibility with key players from the Honduran economic, political and social environmental fields.

### SUMMARY

As a responsible player, Lafarge in Honduras has drawn on the Group's reporting methodology to carry out its own sustainable development report in collaboration with a panel of local stakeholders.

Made up of 10 members with a range of different expertise (local communities, media, banking sector, government, customers, etc.), the panel plays a consultative role and questions Lafarge's sustainable development approach by identifying its weaknesses and suggesting improvements.

### RESULTS

The Honduran stakeholders' panel meets two to three times a year. They first met in 2009 to support the Group's entry in their first sustainability reporting. Since then, their work has been very enriching and has helped Lafarge define its priority focuses in terms of sustainable development. Lafarge in Honduras has released two Sustainability Reports.

### PEOPLE CONCERNED

- The Lafarge team responsible for sustainable development reporting in Honduras
- The members of the Honduran stakeholders' panel.

## India

# NEW PLANT IN HIMACHAL PRADESH

Lafarge entered the North Indian hilly state of Himachal Pradesh and signed a Memorandum of Understanding (MoU) with the State Government in March 2007 for developing a cement project with a capacity of 3 million tons in the State. Following its review of the case, including a site visit in June 2010, the National Environment Appellate Authority (NEAA) quashed the Environment Clearance granted by the Ministry of Environment and Forest (MoEF). The company is challenging the judgement of the NEAA at the High Court.

## Concerns about the project

The proposed project will severely compromise the environment.

## What is Lafarge's position?

- There was a two-year long process to obtain the EC, which included expert observations contained in the Environment Impact Assessment (EIA), the views of the State officials exchanged with the sub-committee of the EAC and observations of this sub-committee itself.
- The EC contains 45 specific and 12 general conditions covering all environmental aspects and earmarks Rs. 900 million (€15 million) as "capital costs + recurring cost per annum" for pollution control devices over the life of the plant.
- Prior to granting the Environment Clearance the concerned Ministry (MoEF) had ensured that all statutory formalities were carried out.
- The plant site was approved by the State Site Appraisal Committee in April 2008, the mining lease was granted in July/August 2008, a 5 hour long public hearing was conducted in December 2008 followed by a site visit of a sub-committee of the Expert Appraisal Committee (EAC) in May 2009, which culminated in the EC authorization in June 2009.
- Since the early days of this project, Lafarge has been committed to total legal and environmental compliance and is actively engaged in CRS activities in the areas of Health, Education and Employability.
- Following the judgement made by the High Court, Lafarge will conduct studies (Wildlife Conservation Plan Study, Feasibility Report of Surface Mining. Note on the impact of increased Crusher Capacity) and share the findings with MoEF.





## Indonesia

# RELATIONS BETWEEN THE BANDA ACEH PLANT AND SOME MEMBERS OF THE LOCAL COMMUNITY

The area of Lhoknga in Indonesia was severely affected by the December 2004 tsunami, including a Lafarge operation: 200 employees and contractors perished in the disaster and two-thirds of the plant was destroyed. Shortly afterwards, Lafarge decided to rebuild the plant at increased capacity to (1.6 Mt) with a total investment of 300 million USD. Since the announcement to rebuild the plant, there have been ongoing difficulties in the relations between the plant and some members of the local community. These difficulties have been highlighted in the last 12 months in two ways: a report published by local NGO, Greenomics, assessing Lafarge's global partnership with WWF International in the context of the local plant and; a hearing organized by the Indonesian Human Rights Institution (known as KOMNAS HAM) in January 2012, involving Lafarge and representatives of the local community: the Governor of Aceh and the Bupati of Aceh Besar (local government for the region) including members of its Environment and Health departments, the Head of Greenomics Indonesia and a representative of the local community.

### Lafarge playing a sufficient role in the local community through its CSR activities

- In 2011, the plant employed 390 people and created around 1,000 indirect local jobs in Aceh.
- Lafarge, alongside international NGO, CARE, has built a microcredit program to allow local households to access loans to improve homes or launch small enterprises.
- January's 2012 KOMNAS HAM asked Lafarge to follow the company's policy dedicated to the respect of human rights, to keep communicating actively with local communities and monitor any complaints and to increasingly improve its CSR performance to respond to the needs of local communities.

### Dust emissions from the use of coal at the plant impacting on health in the surrounding local communities

- Coal is used for an on-site electricity plant, providing electricity for the cement-making process.
- The plant has invested 10,355k USD (cement plant 6,705k USD and power plant 3,650k USD) to install dust abatement equipment (bag filters) at all emission exhaust points (for example, chimney stack).
- Dust emissions are recorded and verified by the country's environmental authorities. This data demonstrates that dust emissions are below the national thresholds.
- At the KOMNAS HAM hearing, it was concluded that a joint-working party should be formed involving representatives from the local government, the local communities and Lafarge to monitor dust levels and understand the source of dust deposits.

### Human rights violations allegations regarding land property (purchase of land associated with the development of a quarry from numerous landowners)

- The number of landowners associated with the purchase of land changed considerably during the process (originally identified as 25 owners, which eventually grew to 46 owners).
- The original land purchase process (in 2006) was conducted by the local government and the local community leaders of Lhoknga. The plant provided the payment and ensured the necessary legal arrangements were made after the land was purchased.

- Disputes about this land arose in 2009 with additional people identifying land holdings in the area purchased by Lafarge. The local government issued a decree stating that this land was government owned, which caused some dissatisfaction from members of the community. This led to the withdrawal of the decree.

- At the hearing in January 2012, the KOMNAS HAM asked the government of Aceh Besar to ensure the correct compensatory mechanisms be applied to community land issues which have not yet been paid by providing the compensation in compliance with the existing rules.

### Human rights violations allegations regarding access to farming areas

- A procedure is in place on the site to ensure the health & safety of all employees and visitors to the site. This is standard health & safety practice for all Lafarge operations. Every employee or person entering a Lafarge site is subject to the same procedure.
- Some farmers have to complete this procedure regularly, as the Lafarge site (in this instance, the area associated with its raw material quarry) needs to be entered in order to access their landholdings.
- Following complaints on this procedure from the farmers, representatives from the Indonesian Human Rights Institution visited the site on December 22 & 23, 2011 to better understand the issue.

### Report published by Indonesian NGO Greenomics assessing the 'critical friend' role engaged by WWF International in its partnership with Lafarge through the role it plays in this operation. The report contains recommendations for WWF to fulfil this role

- The report looks specifically at three issues associated with the plant and the role played by WWF on these issues: 1) dust emissions from the plant; 2) effects of pollution and access issue for nearby agriculture land and; 3) environmental impact of the plant's coal sources.
- The report incorrectly attributes a regulatory role for WWF in respect to Lafarge's operations. For each issue, a local regulator is in place to monitor performance and ensure the plant operates within the necessary environmental parameters.



## United States

# MERCURY EMISSIONS FROM THE RAVENA PLANT

Mercury emissions from Lafarge's Ravena plant are among the highest in the New York State.

## Concerns about the project

- Several Environmental Non-Government Organizations (ENGOS) maintain that mercury emissions from the plant have harmed local residents.
- The site is located across the road from a high school and middle school.
- The plant has been operating for 50 years.
- Lafarge reported 400 lb/year mercury emissions in 2004.
- Mercury is a potent neurotoxin and can affect developing fetuses.
- Mercury can bio accumulate in the food chain.
- New York State has fish consumption warnings for mercury in lakes and rivers throughout the state.
- Preliminary results from a Harvard University School of Public Health (HSPH) study reported that blood mercury levels in Ravena were higher than National levels.

## What is Lafarge's position?

- Lafarge contests the arguments of the ENGOS:
- The Ravena plant conducted a comprehensive investigation of its mercury emissions, and confirmed that actual facility emissions (< 180 lbs/year at full capacity) are lower than what was reported in 2004. Actual emissions reported in 2009 and 2010 were 145 lbs and 95.4 lbs, respectively.
- Mercury emissions are less than 1% of the New York State Department of Health (NYSDOH) short-term and long-term Air Guide Standards which are established to be protective of human health.
- The Ravena Plant operation has been reviewed by New York State Department of Environmental Conservation, Environment Protection Agency & NYSDOH and found to be safe.
- In June of 2011, the NYSDOH sent letters to participants of the Harvard Study. The letter concluded that the individuals should not be concerned about their health based on the test results because the mercury blood sample results are at safe levels.
- As noted by HSPH, the US Center for Disease Control (CDC) had reported much higher average blood mercury levels in the Northeast than in the rest of the nation. The mercury blood levels found in the Ravena study were below the average Northeast levels.
- In July 2011, Lafarge received the necessary permits to modernize the Ravena Plant by constructing an upgraded facility with state-of-the-art technology that will achieve substantial fuel efficiencies and lower air emissions (including significantly lower mercury emissions).

For further details on the Ravena Plant and proposed modernization project please visit: [www.lafargervenafacts.com](http://www.lafargervenafacts.com).

## Slovenia

# ALTERNATIVE FUELS USE PERMIT



Lafarge's only cement plant in Slovenia, located close to Trbovlje, received its IPPC permit in 2009 to use alternative fuels to provide energy for its cement-making process. Since May 2009, Trbovlje plant has used over 14,000 tons of alternative fuels. Local NGO Ekokrog rejects the use of alternative fuels. In March this year, its permit to use these fuels has been suspended by the Ministry for Environment, following a judgement by the country's Administrative Court. A decision on the future process to manage this situation is expected soon.

## Concerns about the project

- Car tyres, plastics and waste oil are particularly hazardous as burning these substances produce some of the most poisonous substances known to man.
- Co-incineration of waste materials is the worst alternative for waste removal.
- Use of waste impacts the performance of the product and impacts the health of people using the cement.
- Government allows Trbovlje to emit levels that far exceed European standards for waste incinerators; values that are absurdly high, and differ from the valid standards permitted in EU countries for waste incinerators.

## What is Lafarge's position?

- The use of alternative fuels is proven and the plant's permit and operation is consistent with European Standards for cement plants.
- There is no impact on the performance of the product – fuels are used to provide energy in the process.
- It is used in cement plants around the world – for example, every cement plant in Germany uses over 50% alternative fuels in their fuel mix – and in a number of different industries globally, including power generation.
- The profile of emissions remains the same whether alternative fuels are used or not. Emission levels are drawn from the composition of the raw materials used to make cement, which is established in International Standards (BREF).
- Air quality monitoring of the local area has demonstrated that the levels of sulphur dioxide, oxides of nitrogen and particulate matter (PM10s) have been at a higher level during periods when cement plant was not operating (such as at the beginning of December 2010) – likely due to increased use of domestic heating systems.
- Incineration is a different process to that of cement-making (and co-incinerating), and different standards are applied for the two separate processes. Cement-making involves heating raw materials – alternative fuels help provide the energy for this process. Incineration involves the burning of the material with no manufacturing process in place. The limits set for both processes reflect the different requirements.
- Additional fossil fuel would be required to replace the energy supplied from the waste.
- The plant has invested over €32 million in the last six years to reduce its environmental footprint. As a result, a number of emissions at the plant have reduced, including nitrogen oxides (down by 43.8%) and sulphur dioxide emissions (reduced by 86.4%).

For further details on the Ekokrog position, please visit: [www.ekokrog.org](http://www.ekokrog.org)

## SOCIETY

**Find out about Lafarge's actions in the field, including projects involving local communities, health and preventive medicine programs, human resources policy and safety measures for employees and contractors. The more recent case studies**

**12/09/2011 Indonesia** - Microcredit for home refurbishment  
Housing for the needy  
**09/02/2011 Zambia** - An efficient response to medical emergencies  
Health  
**07/08/2011 Philippines** - Homes for deprived communities  
Housing for the needy  
**04/12/2011 Korea** - A safety center for local communities  
Safety  
**04/05/2011 Kenya and Uganda** - Planting trees to teach children conservation  
Education

## EDUCATION

**Kenya and Uganda** - Planting trees to teach children conservation  
**Zimbabwe** - A community bursary scheme to help local students  
**China** - Book collection for school children  
**Greece** - Environmental education program  
**United States** - Extra-curricular program to introduce geology  
**Brazil** - Scholarships with Lafarge College  
**Germany** - Agreement between cement plants and local schools  
**Romania** - Support for a professional school  
**China** - "Love the Earth Ambassador" campaign  
**Kenya** - Green Schools project  
**Malaysia** - Scholarships and Excellence Awards  
**Greece** - Students' scholarships on the island of Nissiros

## INFRASTRUCTURES

**China** - Anti-seismic plasterboard system for school reconstruction  
**Nigeria** - Sagamu IT Learning Center restoration  
**Thailand** - Renovation of Roomo village's kindergarten school  
**Thailand** - Renovation of the Darika Muslim school  
**France** - Restoration of La Couronne Abbey  
**Indonesia** - Renovation of Charoenrat Temple  
**Sri Lanka** - Development of hospital facilities for underprivileged people  
**Bangladesh** - Social care from Lafarge Surma Cement  
**Brazil** - Water for Glaucilandia

## HOUSING FOR THE NEEDY

**Indonesia** - Microcredit for home refurbishment  
**Philippines** - Homes for deprived communities  
**South Korea** - Lafarge and Habitat for Humanity celebrate their 10<sup>th</sup> anniversary  
**Honduras** - Partnership with Habitat for Humanity  
**Venezuela** - Care center for the needy and the homeless  
**Romania** - Lafarge & Habitat for Humanity  
**UK** - "Sweat Equity"

**South Korea** - "Love in Action" project  
**USA** - "Jimmy Carter Work" project  
**UK** - "CRASH"  
**South Africa** - Eco-City, an ecologically sustainable village in Johannesburg  
**South Africa** - Eco-City in a Johannesburg township

## AID AFTER A NATURAL DISASTER

**Romania** - A partnership for the reconstruction of 30 homes  
**Pakistan** - Helping victims after the 2010 summer floods  
**Moldova** - Cement donated to rebuild housing and infrastructure  
**India** - Donation following cyclone Aila  
**China** - Emergency aid and reconstruction following an earthquake  
**Honduras** - Donation following Hurricane Mitch  
**Sri Lanka** - Donation following floods  
**Germany** - Help to rebuild Rade village after the floods of summer 2002  
**Turkey** - Aid after an earthquake

## CHILD PROTECTION

**UK** - CHaMPS and missing persons  
**UK** - Building a BMX track  
**Mauritius Island** - Craft Academy  
**Philippines** - Urchins-Street Kids Association project  
**Asia** - Support for Children's aid mission  
**Malaysia** - Visit to a child protection orphanage  
**Sri Lanka** - Projects for orphanage developments  
**Russia** - To bring support to the Malichok orphanage  
**China** - Langfang Children's Village

## HERITAGE PROTECTION

**Iraq** - Renovation of the Erbil Citadel  
**United States/France** - The RMHF grant for heritage architects  
**France** - Renovation of Eileen Gray's Villa E1027  
**France** - Highlighting archaeological discoveries  
**Brazil** - Restoration of Ballet Cavern  
**Romania** - Lafarge and the restoration of national heritage buildings  
**Turkey** - Istanbul is as nice as my home  
**Italy** - The "Colors project", the Environmental reclamation project  
**China** - The giant panda, a species to protect  
**Turkey** - The Lafarge Memorial Forest project  
**South Korea** - The Baekdudaegan conservation project  
**UK** - Preserving a prehistoric fossil  
**France** - Blending into the cityscape  
**China** - Conserving ancient kilns  
**Chile** - Mural painting

## SUPPORT FOR SPORTING AND CULTURAL ACTIVITIES

**Brazil** - Le Corbusier exhibition in Brazil for the French Year  
**Austria** - Fund-raising initiative  
**South Korea** - Funding of an in-line roller skating team  
**China** - Tang Kou Fitness Center for the elderly  
**South Korea** - Fitness center and public baths for the local community



# Partnerships

In every country where Lafarge is present, the company builds relationships with local representatives and members of NGOs.

## Our partnership with CARE France

Since 2003 and its first partnership, Lafarge has been working with CARE to **fight HIV/Aids** by implementing prevention, screening and treatment programs.

**A Health Committee for the African region** has also been set up to establish indicators, coordinate actions and share best practices. The Committee is made up of a health coordinator from each country, a Group representative, a CARE representative and a medical adviser.

With the renewal of the partnership in 2009, Lafarge and CARE have chosen to work together on three programs:

- **Health:** rolling out the methodology of combating Aids and Malaria to other countries.
- **Method:** developing a tool for assessing the social and economic impact on local communities of the actions implemented by our sites and plants in emerging countries.
- **Housing:** launching a program enabling the poor in emerging countries to have access to higher-quality housing at an affordable cost.

## Our partnership with WWF

By signing a global partnership in 2000, **Lafarge was the first industrial player to become a WWF 'Conservation Partner'.**

First renewed in 2005, a new partnership has been signed in 2009 for four years. The objective: formalize a shared ambition to combine economic constraints, environmental and people respect in order to reduce the Group's environmental footprint.

In 2009, Lafarge and WWF jointly identified key areas of work where the Group has made practical commitments:

- Climate change
- Persistent pollutants
- Water consumption
- Biodiversity
- Sustainable construction.

## Lafarge and WWF - partners for 10 years

Since 2000, the partnership between Lafarge and WWF has been based on mutual trust and transparency. This success demonstrates that the corporate sector can work alongside NGOs to reach common goals.

Those principles contributed to achieving long-term results. With help of WWF, Lafarge developed concrete initiatives in its five key areas of action:

- **Climate change:** in 2001, the Group set a target of 20% reduction of its net CO<sub>2</sub> emissions over the period 1990-2010. By 2010, Lafarge took a significant step in the fight against climate change by achieving a **reduction of 21.7% of its net CO<sub>2</sub> emissions.**
- **Persistent pollutants:** through the work on persistent pollutants, Lafarge has completed at least one **test for mercury and dioxins at all of its regularly operating kilns** that have been part of the Lafarge Group for at least three years.
- **Water consumption:** Lafarge set up **four pilot sites** in the United Kingdom, Romania, Egypt and Spain **to assess the Group's water footprint.** These pilot sites have enabled the Group to implement a guide in order to manage and better conserve water resources.

“The Lafarge – WWF Partnership seeks to show that economic growth and greenhouse gas reductions can go together.”

## “ 11 local initiatives were launched in 2011 in mature and developing countries. ”

- **Biodiversity:** screening has been completed for 94% of the 716 active quarries across the Group. 47% of quarries that are in protected areas and/or sites containing IUCN red list species have Biodiversity Management Plans.
- **Sustainable construction:** new products and systems continue to be developed by Lafarge to promote **simple but effective ways to reduce the carbon footprint of products** and enhance the energy efficiency of buildings.

Lafarge and WWF have also launched the environmental campaign “Climate Savers - Let the clean economy begin”. This unique program, in which leading companies are committed to reduce their CO<sub>2</sub> emissions, is an opportunity to show that economic growth and greenhouse gas reductions can go together.

### Promoting local projects

This global partnership enables the Group to draw up action plans which can be adapted at a local level, responding to a country's needs and challenges. To foster local partnerships between Lafarge's countries and national WWF offices, the partnership management teams provide financial support, guidance and follow-up for projects implemented on the ground.

So far, 11 local initiatives have been launched:

- **Austria:** rehabilitation of the Mannersdorf quarry and creation of the Biodiversity Index.
- **Kenya:** forest conservation in the Shimba Hills area and development of bio fuels.
- **Canada:** conservation of fauna and flora through an extensive mapping program ensuring the protection of the region's large predators.
- **Spain:** ecological rehabilitation of the Yepes-Ciruelos quarry.
- **Romania:** biodiversity and rehabilitation of the Matasaru quarry, located in a Natura 2000 area.
- **USA:** biodiversity and ecosystem valuation in the Presque Isle aggregates quarry.
- **Northern Ireland:** quarry rehabilitation and development of an eco-tourist and sustainable housing project.

- **Philippines:** sustainable construction, assessing the life cycle of blended cements.
- **France:** eco-friendly rehabilitation of WWF France HQ, work on existing biodiversity indicators and a working group on sustainable construction.
- **Canada:** sustainable and economic implementation of renewable biomass fuels.
- **China:** low carbon building and hotel construction; waste recycling management in cities to develop the use of solid waste as an alternative fuel in cement manufacturing. Capacity building for decision makers.

### Our partnership with the Wildlife Habitat Council in North America

#### Local Partnerships

In every country where Lafarge is present, the company builds relationships with local representatives and members of non-governmental organizations (NGOs). The Group relies on their expertise and local knowledge to implement efficient development programs.

#### Partnerships with local associations

While global partnerships are very important, Lafarge does not overlook the need for partnerships with local associations or NGOs.

Thousands of programs are currently being carried out in the field. They touch on all aspects of sustainable development: quarry and site rehabilitation, housing for under-privileged populations, infrastructure development, preventive medical programs, local economic development, etc.

#### For example: Wildlife Habitat Council

In the United States, Lafarge supports this NGO, which converts unused land into ecological spaces that favor biodiversity. In less than 20 years, over 2 million hectares in 48 countries have been “converted”.

# Sustainable construction

Energy used in building represents about 39% of worldwide total energy consumptions.

To reduce this amount, a collective effort of all building owners and users is required.

“Sustainable construction” is the contribution of all actors that are using or shaping the built environment to achieving the ambitions of sustainable development. Building sustainability is complex and multi-faceted but Lafarge is making a contribution in many aspects.

When looking at the life-cycle energy balance over a 50 year period, in most existing residential buildings about 85% of the total energy use occurs during the operational phase of a building's life. The remaining 15% is due to the manufacturing of building materials, erection, maintenance, and its end of life (demolition and recycling). These proportions may vary by climate, building type and service life.

**“Lafarge acquired in-house design capabilities that optimized and documented a set of 30 “Efficient Building™” systems.”**

## Designing buildings for sustainability

### A. New constructions

In 2011, Lafarge acquired in-house design capabilities that optimized and documented a set of 30 “Efficient Building™” systems. Their technical assessment includes structural, thermal, environmental footprint and cost considerations. By having used an integrated design approach, the result gives architects, engineers and contractors clues on how these systems can help them achieve higher overall building sustainability levels at affordable cost. Further, Lafarge developed early assessment tools to help tailor the building systems to single project requirements.

Lafarge focused in 2011 on building systems suitable for the Mediterranean climate. We will pursue this effort in the coming years with the development of building systems for other climates. These building systems and tools have been peer reviewed by a challenging panel of external engineers and architects.

To deliver this know-how to the market, Lafarge has recruited a new team with the capabilities of showcasing the benefits of such systems to property

developers, architects, engineers and contractors. Already a number of projects have been designed based on these new internal resources. For instance, in France, Lafarge partnered with the home building company Cecile Robin to demonstrate how positive energy buildings can be designed and built at very low construction cost using our innovative materials with traditional construction modes. These houses are designed for extended service life with limited maintenance due to the durability of concrete.

### B. Existing buildings

Energy used in buildings represents about 39% of total worldwide energy consumption. To reduce this amount, a collective effort of all building owners and users is required to significantly reduce the amounts of energy use and subsequent CO<sub>2</sub> emissions caused by office buildings. For this reason Lafarge decided to lead by example and in 2011 started to implement WBCSD's Energy Efficiency in Buildings Manifesto. The Group carried out in depth analysis of energy consumption in 11 large office buildings used by 3,200 employees, covering 70,000 square meters. As a result, Lafarge has drafted a Low Energy Office Policy that states:

- Lafarge offices aim to be best in class in energy efficiency when compared to similar offices in their geographic areas;
- Lafarge commits to gradually reduce office energy use;
- Energy consumption will be compared to reduction targets and annually published as part of the Group's Sustainability Ambitions.

## Lafarge's environmental footprint reduction in the construction chain

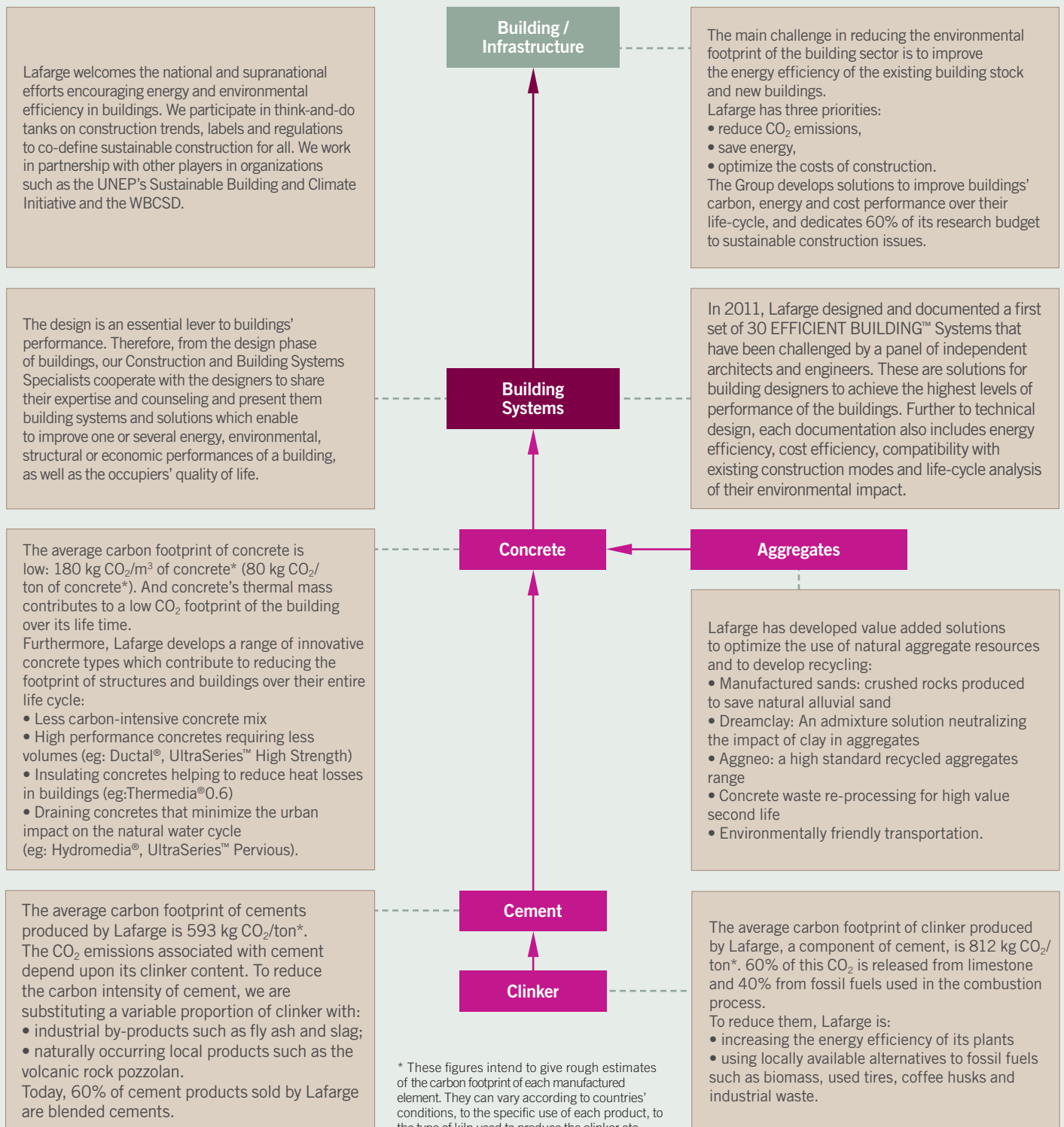
### Access to housing

With the world's population quickly expanding, especially in urban areas of emerging markets, there is a greater need for decent and affordable housing. This will strain economic and social systems and put unprecedented pressure on the allocation of scarce resources. In 2011, Lafarge carried out several national initiatives contributing to affordable and efficient housing in Indonesia, Philippines, Honduras and France.

**Indonesia:** Lafarge launches a pilot fund to generate 100 new projects

In partnership with CARE, Lafarge Cement Indonesia has set up a pilot microcredit program for low-income families to enable them to renovate and expand their houses. The aim is for recipients to

## COMMITTED TO REDUCING THE ENVIRONMENTAL FOOTPRINT AND COSTS OF BUILDINGS AND INFRASTRUCTURE OVER THEIR ENTIRE LIFE-CYCLE



Source: Lafarge Data 2011

improve their living conditions and develop new economic activities. Five microfinance institutions were selected. In collaboration with the University of Aceh, Lafarge has provided technical assistance and conducted a training program for masons. 100 micro-loans have been granted which will improve the lives of 500 people. Based on this experience, Lafarge is launching several projects in Indonesia, Honduras and other countries.

### Shaping Lafarge R&D

Following the course set in 2009, in 2011 the Lafarge R&D program continued to deliver new products to enable construction to be more sustainable. In 2011, Hydromedia™ was launched: this new high permeable concrete allows rainwater passage and facilitates its natural runoff into the ground to replenish groundwater, avoiding saturation of the storm-water treatment network, reducing the risk of flooding in urban areas and reducing water accumulation on roads and paths.

### Lafarge Invention Awards

In 2011 Lafarge conducted a European competition to promote innovations for more sustainable construction. One hundred applications were received from eighteen countries, and three projects from France, Poland and Serbia were recognized by an international panel for the quality of their work. The awards were given for the design of a concrete-based artificial reef that fosters marine biodiversity and fisheries, while providing scour protection for underwater structures such as offshore wind power piles, cables and pipelines. The other two prizes went to innovations that improve building thermal performance by integrating heating and cooling equipment in walls and insulation in precast concrete elements.

### Involving the whole sector in innovation

Lafarge believes that a building's environmental footprint begins from its design stage. In order to offer solutions upstream in the value chain, the Group focuses on innovation, devoting over 50% of its R&D investments in 2010, representing more than 70 million euros, to sustainable construction. The Group works in close collaboration with the leading research centers and prestigious universities worldwide, including:

- MIT (Massachusetts Institute of Technology) in the United States;
- The Ecole des Ponts et Chaussées and the CNRS in France;
- Tsinghua University in China;
- IIT Madras in India.

Lafarge also carries out research in collaboration with architecture firms and engineering offices to offer solutions with environmental characteristics most suited to projects. For example, the Group worked with the firm Arte Charpentier to design Essilor's new R&D center, which sets an environmental benchmark.

Collaboration with players in the sector also includes partnerships with project owners, such as Bouygues Construction, with whom Lafarge develops innovative solutions responding to sustainable construction challenges.

### Taking the lead in sectoral bodies

Lafarge works in numerous bodies and working groups, on an international and local level, to promote more sustainable construction and contribute to progress towards more sustainable methods of construction, in its sector and beyond.

### The World Business Council for Sustainable Development (WBCSD)

Lafarge is a member of the World Business Council for Sustainable Development (WBCSD), an organization of 200 large companies committed to a sustainability approach. In the context of the WBCSD, Lafarge is particularly active in two programs: CSI and EEB.

### Cement Sustainability Initiative (CSI)

Along with 22 cement manufacturers operating all around the world and representing more than 40% of global production, Lafarge is an active member of the "Cement Sustainability Initiative" which we co-founded 10 years ago. The program offers a framework for dialogue and best practice exchange between cement manufacturers committed to sustainable development through:

- Climate protection,
- Resources optimization (natural raw materials and fossil fuels),
- Health and safety for employees.

### Energy Efficiency in Buildings (EEB)

Lafarge co-chaired WBCSD's Energy Efficiency in Buildings (EEB) project launched in 2006. During its first phase of work, it focused on delivering an understanding of the international building sector's use of energy. The project produced recommendations and a roadmap for a transformation of the building sector to reach an 80% cut in energy use by 2050, while being economical and socially acceptable. Since early 2011, EEB has been scoping its future phase of work to actually trigger implementation within this complex and fragmented sector.

Four major players in the building and energy sectors (Lafarge, Arcelor, EDF and GDF SUEZ) launched the "Fondation Bâtiment-Energie", a recognized NGO in France that finances research in energy efficiency in buildings.

### With the United Nations

As part of the United Nations Environment Program (UNEP), Lafarge is leading the Sustainable Buildings and Climate Initiative.

The goal is to promote the most environmentally-friendly practices and establish criteria for assessing construction and building.



## PANEL LIVIA TIRONE ARCHITECT

It is a privilege to be a member of the Lafarge stakeholder panel – both because of the contribution I am invited to make individually to the company and because of the collective contribution that results from very interesting discussions with my very knowledgeable stakeholder panel colleagues.

Concrete is a critical ingredient of the sustainable and resilient built environment. The overall performance of buildings is context specific – therefore: construction systems that work in one climate, cultural or risk context may not have the same outcome in another. Always when well integrated, concrete prolongs the life span of buildings and also, on many levels, optimizes their contribution to resource management, while increasing comfort and indoor air quality for the user.

I congratulate Lafarge for initiating the **paradigm shift from Materials Supplier to Efficient Building System Provider**, as only in this way is it possible to ensure concrete adds true value to the built environment.

I also congratulate Lafarge for setting up the team of **Lafarge construction and building system specialists** operating all over the world, coaching specifiers to use concrete to its optimal potential.

I further congratulate Lafarge for its pioneering work in developing front line solutions and **efficient building systems** that are context adapted and contribute to optimizing the built environments performance.

As a member of the Lafarge stakeholder panel I would like to express a **wish list** to enhance the mainstreaming qualities Lafarge can provide for the planet:

- The paradigm shift from Materials supplier to Efficient Building System provider implies an entirely new positioning in relation to the construction sector. It is essential that **Lafarge participates in (or leads) strategic working groups and open networks devoted**



**to developing robust and innovative construction solutions** that answer societal needs.

- **Thermal Inertia** in all its forms is, in some climate contexts, a critical quality to ensure health and comfort at low resource dependency: in the context of sustainable construction and efficient building systems it is essential to **quantify (dynamic simulation, ongoing monitoring and modeling) the very relevant contribution of thermal inertia** and make the data available to specifiers.

- **Sustainability Labels** (LEED, BREAM among others), don't give importance to solutions whose performance is not quantified. Contributions during the lifetime of the built environment are often underestimated in these labels. The many construction systems integrating concrete can have a much more positive outcome in these Sustainability Labels, if Lafarge proactively supplies their relevant performance data.

- **Urban Planning Regulations** can make or break the mainstreaming of good practices.

In order to be heard by the relevant actors who define these regulations **it is essential to collaborate with strategic construction sector Stakeholders so as to develop cross sector recommendations that enhance the resilience of the built environment.**

I have no doubt about Lafarge's very positive contribution to the overall performance of the built environment, but it is my view that if the above wish list is put in practice, mainstreaming of excellent practices in the built environment will be taken to a higher level.

## France

# THE JAMBERT-LAFARGE LEB HOUSE



**The construction sector in France is searching for greater energy efficiency, in a context of global sustainable construction challenges. By setting a target for overall consumption of 50kWh.m<sup>2</sup>/year by 2012, French legislation has begun the process of making Low-Energy Buildings (LEBs) more widespread.**

**Lafarge has teamed with French residential construction company Maisons Bernard Jambert to design and build the Jambert-Lafarge LEB home. The partnership's objectives are to promote traditional construction methods (cement, concrete and gypsum) and provide effective, sustainable solutions to buildings' energy performance challenges.**

The house was inaugurated in November 2010, 10 months after construction started. It has been developed with a proven construction method and combines energy efficiency, energy saving and respect for the environment.

To do this, the Group particularly provided:

- Agilia® for the foundations, slab and screed, etc.
- Unimat® for the sub-screed and sub-slab insulation, etc.
- Prégymax® 29.5 plasterboard for the internal thermal insulation,
- Prégymetal® plasterboard for dividing partitions,
- Synia® plasterboard for the ceilings,
- Prégydro™ plasterboard for the bathrooms, etc.

A thermal study conducted by a certified engineering office concluded that the objectives were achieved by demonstrating that the house's overall consumption is less than 48kWh.m<sup>2</sup>/year! It thus meets the requirements of the LEB label Effinergie, anticipating the future 2012 French Thermal Regulations.

And in December 2009, the house was awarded a gold medal in the "Town House" category at the "Challenge des Maisons Innovantes" awards, a competition encouraging creativity and innovation in residential construction.

As well as its energy qualities, the main market advantages of the house are:

- aesthetic, comfortable and user-friendly architecture,
- quality services at an attractive price,
- a home which is wheelchair accessible,
- plans which can be reproduced on a mass scale and at low cost.

# Climate change

After having reached our initial carbon emissions reduction objectives, Lafarge has committed to reduce carbon emission per ton of cement by 33% compared to 1990 levels.

One of the main priorities of Lafarge's sustainable development strategy is to actively contribute to climate change mitigation and adaptation. For the past decade, our efforts have been focused on improving our industrial performance to reduce the carbon emissions from our operations and on leading the effort in the cement industry. In 2011 we released our second generation CO<sub>2</sub> objectives. They demonstrate our commitment to adopt a value chain approach, and to address climate adaptation issues, especially in emerging economies.

In 2011 Lafarge inaugurated two research centers dedicated to sustainable construction, in China and in India; two of the world's most dynamic markets. In addition, the Group has appointed local "climate correspondents" in nine operating units: China, India, Indonesia, Republic of Korea, Saudi Arabia, Russia, South Africa, Brazil and Mexico.

Our second generation CO<sub>2</sub> objectives take into account our ambition and aim at developing ten innovative product ranges by 2015, and at contributing to 500 sustainable construction projects by 2020.

**Lafarge inaugurated two research centers dedicated to sustainable construction, in China and in India.**

## Reduce the carbon emissions induced by our operations across our value chain (scope 3)

Accurate monitoring and transparent reporting of carbon emissions from our operations are at the heart of our approach to managing climate change. In 2011, we ranked 10<sup>th</sup> in the Carbon Disclosure Project, which positions Lafarge as the leader of French companies and global industrial companies. In 2012, our ambition is to account for "scope 3" emissions from our operations (transportation, suppliers' carbon emissions, etc.).

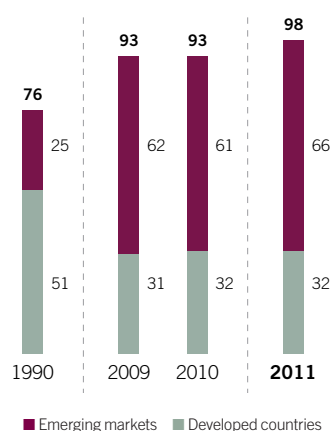
After having reached our initial carbon emissions reduction objectives a year ahead of schedule, Lafarge publicly committed in 2011 to reduce carbon emissions per ton of cement by 33% in 2020 compared to 1990 (reference year).

## Develop product solutions for climate adaptation, especially in emerging countries

Taking into consideration our Stakeholder Panel's comments, we focused our efforts in 2011 on emissions linked to the use of our products, especially in emerging economies.

### Lafarge total gross CO<sub>2</sub> emissions

(millions of tons/year)



Our gross emissions have increased by 5% in 2011, mainly as a result of the cement volumes increase in emerging countries (10%), consistent with the geographical development of Lafarge. Overall our gross emissions have grown by 29% over 1990. However, our gross emissions in industrialized countries have seen a reduction of 37%, partly due to the impact of the economic downturn.



## Lafarge total net CO<sub>2</sub> emissions

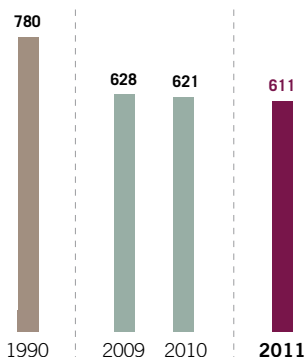
(millions of tons/year)



Our net emissions increased by 5% in 2011, mainly as a result of the cement volumes increase in emerging countries (10%). Since 1990, net emissions have increased by 26%. Industrialized countries saw a 41% decline while emerging economies net emissions are more than two and a half times higher than in 1990.

## Gross CO<sub>2</sub> emissions

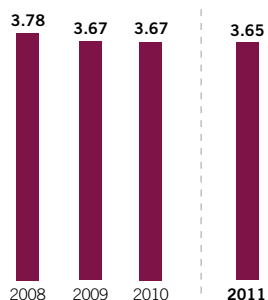
(kg per ton of cementitious product)



In 2011, our gross emissions per ton were 21.7% lower than 1990 levels.

## Specific heat consumption

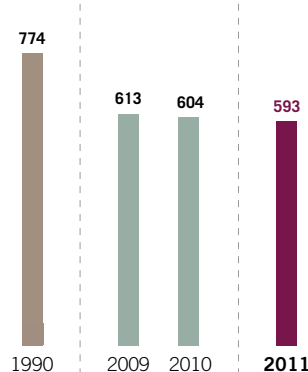
(energy production per metric ton of clinker produced - GJ/ttk of clinker)



Our average specific heat consumption continues to improve as new technologies are deployed, especially in emerging markets.

## Net CO<sub>2</sub> emissions

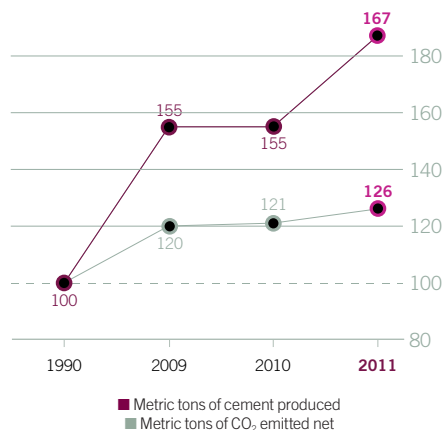
(kg per ton of cementitious product)



In 2011, our net emissions per ton of cement were 23.3% lower than 1990 levels, so well on track towards our 2020 target of a reduction of 33% versus 1990.

## Carbon efficiency in operations

(trend on net emissions and cement produced)



In 2011 we produced 67% more cement than in 1990 but our CO<sub>2</sub> emissions increased by only 26% over the same period.

## Indirect energy consumption in PJ



Electrical energy consumed by our operations

## Lead cement sector efforts in measuring the carbon footprint of its products

In 2011 our engagement in the CSI (Cement Sustainability Initiative) has been dedicated to the facilitation of the integration of Chinese and Indian cement producers (notably by helping them improve their emissions reporting capacities).

In addition, our efforts have been geared toward the development of a common methodology to measure the environmental footprint of concrete products. By taking into account our impact beyond carbon emissions, we are able to account for the sustainable construction performance of our products.

### Fuel mix in the Cement business

(% of total)	1990	2009	2010	2011
Coal	55.1%	43.3%	45.1%	46.5%
Coke	8.4%	20.0%	19.4%	17.0%
Oil	13.6%	8.4%	7.1%	6.8%
High Viscosity Fuels	2.1%	0.1%	0.1%	0.2%
Gas	18.1%	17.4%	16.7%	16.5%
Waste	2.0%	6.9%	7.6%	8.3%
Biomass	0.7%	3.9%	4.0%	4.7%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Since 1990 the part of the alternative fuels in our fuel mix has grown while coal and oil have declined. We have virtually eliminated the use of high viscosity fuels. Gas, whose use remains stable, has a CO<sub>2</sub> emission factor 40% lower than coal.

## Integrate climate change initiatives to an ambitious sustainable development strategy

Our actions on climate change mitigation and adaptation are part of a wider sustainable development strategy to create shared value locally, and ensure that our operations make a positive contribution to local communities.

Therefore, Lafarge has invested so that its cement plant kilns are able to burn waste and biomass. In so doing, Lafarge reduces its carbon emissions, creates direct local jobs, and helps emerging countries to address the issue of waste.

Example: **Jatropha cultivation in Nigeria: a project that benefits everyone.**

The Lafarge Ashaka business unit, situated in the north east of Nigeria, has set up a project for the cultivation of biofuel in partnership with local farmers. In accordance with local customs, Lafarge supports the cultivation of Jatropha, a biomass fuel, by providing farmers with agronomic skills and purchasing the crops. This project ensures additional revenues to local farmers, since all the production of Jatropha is bought by our local plant. The plant uses this crop as biomass fuel in the kilns, a carbon neutral fuel which is less expensive than fossil fuel.

Our goal is to involve 5,000 farmers - up to a third of local farmers - in the short and medium term.

The project simultaneously promotes the development of local economic activity, environmental protection and cost reduction.

## The fight against Climate Change within Lafarge

Lafarge has developed and is implementing a comprehensive strategy contributing to the overall objective of limiting the Earth's temperature increase to a maximum of 2°C. The Group surpassed its 2010 objectives a year ahead of schedule and set three new targets for 2015 and 2020, within the framework of its partnership with WWF. They now encapsulate the entire construction chain.

### Reducing CO<sub>2</sub> emissions

In 2001, the Group set public and voluntary commitments to reduce its CO<sub>2</sub> emissions within the framework of a pioneering partnership with WWF.

Lafarge has fulfilled its 2010 objectives a year ahead of schedule:

- -10% absolute gross emissions\* in industrialized countries: they were cut by 36.5% in the Cement business between 1990 and 2010,
- -20% net emissions\* per ton of cement produced worldwide: they have been reduced by 21.7% between 1990 and 2010.

(\* Gross/net emissions: net emissions equal gross emissions minus emissions related to the burning of waste.)

### Going beyond plants

The construction sector accounts for 40% of the global energy demand, and for 30% of the overall greenhouse gas emissions.

In 2011, the Group announced its new set of commitments, with the approval of WWF International.

Lafarge's three new targets for 2015 and 2020 reflect a comprehensive, ambitious and original approach. They go beyond plants' CO<sub>2</sub> emissions and encapsulate the entire construction chain:

- Reducing CO<sub>2</sub> emissions per ton of cement produced by 33% between 1990 and 2020;
- Developing 10 innovative products ranges and contributing to 500 sustainable construction projects by 2015;
- Promoting CO<sub>2</sub> performance enhancement policies which are adapted to Lafarge's industry in international and professional organizations.

### Relying on industrial ecology and innovation

To meet these objectives, the Group is:

- reducing energy consumption,
- modernizing its plants and constantly improving its industrial processes,
- developing industrial ecology through the use of alternative fuels and industrial waste, particularly slag, fly ash and pozzolan, to manufacture cement.

Lafarge also increases its R&D efforts to:

- develop clinker which produces less CO<sub>2</sub>. For example, new clinker Aether incorporates less limestone and can be heated to lower temperatures, which will allow a 25 to 30% cut in CO<sub>2</sub> emissions.
- perfect processes which make more efficient use of energy,
- optimize the composition of concrete and improve recycling.

### Leading the industry

Lafarge is sharing its vision on climate change and CO<sub>2</sub> performance with other cement players, other industries and also with its stakeholders, such as WWF. The Group addresses all actors in the value chain and participates in partnerships and collective actions, such as:

- the WBCSD (World Business Council for Sustainable Development),
- the EEB (Energy Efficiency in Building) project,
- the WBCSD Cement Sustainable Initiative (CSI), which was co-chaired by Bruno Lafont in 2010,
- the Building Energy Foundation,
- UNEP (United Nations Environment Program),
- Upstream collaboration with clients, architects, engineering and construction companies in developed and emerging countries.

### Implementing Clean Development Mechanisms

Lafarge conducts a number of projects aimed at implementing Clean Development Mechanisms (CDM) within the framework of the Kyoto Protocol. Three projects have already been recognized by the CDM Executive Committee:

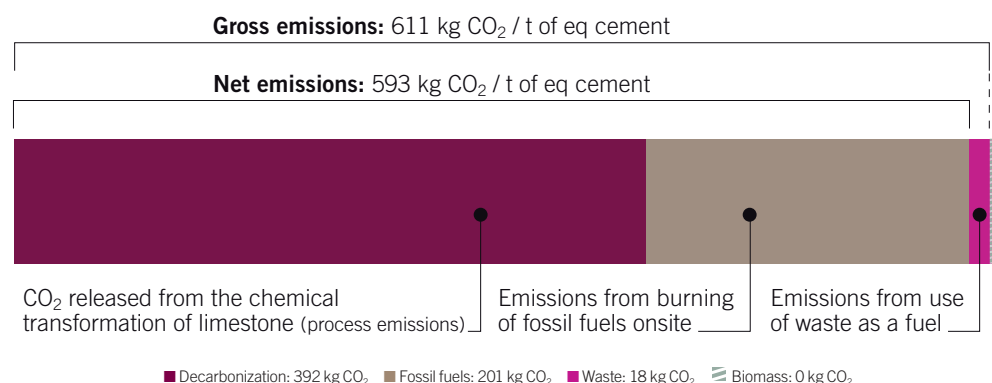
- in Morocco, the Tetouan wind farm supplies 50% of the electricity used by the local Lafarge cement plant (30,000 tons of CO<sub>2</sub> per year avoided),
- in Malaysia, 5% of the thermal energy for the Rawang and Kanthan cement plants comes from biomass (60,000 tons of CO<sub>2</sub> per year avoided),
- in India, fly ash from conventional power plants is recycled for use in cement (70,000 tons of CO<sub>2</sub> per year avoided).

These three Clean Development Mechanisms provide annual savings of 160,000 tons of CO<sub>2</sub>, an environmental benefit equivalent to planting 10.6 million trees per year!

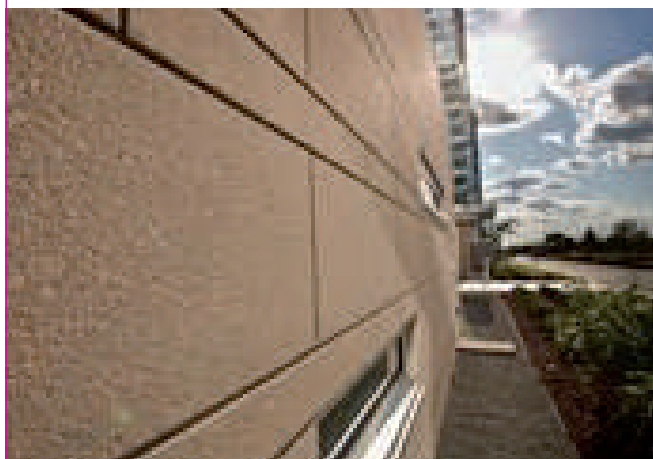
A 4<sup>th</sup> project was approved by the CDM Executive Committee early 2011: in the Philippines, the Teresa cement plant will recover the waste heat released during the production of cement to transform it into electricity, covering 31% of the plant's energy requirements. The greenhouse gas emissions will be reduced by almost 12,000 tons per year.

### Explaining gross and net emissions

(gross and net CO<sub>2</sub> emissions from the manufacture of 1 metric ton equivalent cement)



Net emissions exclude emissions due to burning of waste because the disposal of that waste by other means would also give rise to greenhouse gas emissions.



## Aether

# A LOW ENVIRONMENTAL FOOTPRINT CLINKER

Aether, a project aimed at reducing the CO<sub>2</sub> footprint of cement, receives financial support from the European Union. Aether, an innovative project developed by Lafarge to reduce the CO<sub>2</sub> footprint of cement, is receiving support from the European Union. This support is provided under the European "LIFE+" program, a financing instrument supporting environmental projects. Aether has been developed in collaboration with the Institute for Building Materials in Poland (MBM) and the British Building Research Establishment (BRE). It will contribute to continuing the reduction on the Group's CO<sub>2</sub> emissions.

## Aether, a new clinker formulation to cut CO<sub>2</sub>

This new product is a clinker, the main component of cement. It has been tested in the laboratory, as well as in an industrial kiln, and has demonstrated its full potential. Results show that Aether could represent an alternative to traditional Portland cement offering comparable technical properties, manufactured in a traditional cement plant kiln after just a few modifications, and leading to a lower overall environmental footprint.

Aether, is a new clinker chemistry, which allows Lafarge to go further by acting on two fronts:

- reducing the level of limestone and therefore increasing the part of gypsum, clay and bauxite, providing a 25% reduction in CO<sub>2</sub> emissions;
- reducing the firing temperature required for the chemical reaction to occur (~1300°C), providing a 15% reduction in energy consumption.

For more than 20 years, Lafarge has been working to reduce its CO<sub>2</sub> emissions through:

- the use of cement additives such as ground limestone fly ash and slag, to reduce the amount of burned limestone;
- the use of alternative fuels and improvements in energy efficiency (by optimizing the process and modernizing plants), to reduce the proportion of fossil fuels used by plants.

## Innovation, a Group strategic priority

Lafarge has made innovation one of its two strategic priorities in order to offer its customers materials which correspond to their needs, as well as breakthrough solutions which will address the challenges of tomorrow. Lafarge wants to act at every phase of a building's lifespan; it therefore offers both innovative materials with a lower environmental footprint and construction solutions reducing the total energy consumed by a building.

## Canada

# LAFARGE-WWF LOCAL PARTNERSHIP FOR THE USE OF BIOMASS



With WWF Canada, the cement plant in Bath (Ontario) produces its own fuel by growing crops to produce biomass.

## OBJECTIVES

- To develop crops which can be used as alternative fuels on the site of the Bath cement plant;
- To replace fossil fuels (coal and coke) with biomass, an environmentally neutral fuel, to supply the cement plant kiln and reduce its CO<sub>2</sub> emissions.

## SUMMARY

In November 2010, Lafarge in Canada and WWF Canada signed a local collaboration agreement to develop the "Energy Farm" project. This initiative forms part of the global partnership between the Lafarge Group and WWF International signed in 2000.

The aim of "Energy Farm" is to use the cement plant's unoccupied land to grow crops and to transform the biomass produced into energy. The first crops were planted in 2009. Research is currently being carried out into the most appropriate species, the most economical production techniques and long-term obstacles (notably the impact on farming production for food). Studies will also be carried out into water management and protection of wildlife.

The project is supported by Ontario's Environment Ministry which has set itself a target of reducing CO<sub>2</sub> emissions by 17% between 2005 and 2020.

## RESULTS

A large-scale transformation test was carried out successfully in June 2010: 500 tons of biomass were substituted for fossil fuels, reducing CO<sub>2</sub> emissions by 1,000 tons.

The project was awarded first prize in the Environment category by the Portland Cement Association in 2010.

## PROSPECTS

WWF Canada will publish recommendations for the bioenergies sector based on feedback from the Bath cement plant.

The work carried out in Bath is acting as a pilot which may be duplicated many times and serve as a development model for other industries in the region.

## TOTAL COST

The project received €210,000 in financial support from the Group and WWF International for the period 2011-2012.

## PEOPLE CONCERNED

• WWF Canada • Lafarge in Canada • The Institute for Energy and Environmental Policy at Queen's University in Kingston • The Province of Ontario and its Environment Ministry • Canada's Ministry of Natural Resources and Ministry of the Environment.



## China

# HOUSEHOLD WASTE TREATMENT

**In China, Lafarge burns the household waste from a city with a population of 800,000 to manufacture its cement! Zunyi Cement/China**

### OBJECTIVES

- Contribute to the local authorities' environmental protection policy and management of non-renewable resources;
- Provide a safe, innovative and fast-to-implement solution for the management of waste from communities where Lafarge is based;
- Replace the fossil fuel required to manufacture cement with alternative fuels available in large quantities;
- Reduce the quantities of CO<sub>2</sub> released during the manufacturing of cement;
- Optimize cement manufacturing costs.

### SUMMARY

In 2011, Lafarge signed its first large-scale partnership with a municipality in China for the recovery of household waste.

The city of Zunyi in Guizhou province, in south-west China, was looking for a solution for processing its waste, whose quantity is increasing significantly. Under the terms of the partnership agreement, Lafarge has undertaken to recover the fuel portion of the household waste produced and also to make use of waste landfilled for more than 10 years through "landfill mining".

Lafarge uses an existing sorting facility to retrieve recoverable materials, mainly plastic packaging. The project has created 40 jobs.

### RESULTS

Lafarge recovers 25% of the waste produced each day by the city of Zunyi, and will also recover 180,000 tons of land filled waste over the next 10 years.

In 2012, 28,000 tons of waste will be recovered at the Sancha plant, reducing coal consumption by 18,000 tons.

### PROSPECTS

The partnership contract with the municipality of Zunyi has been signed for 25 years, thereby securing a cheap and plentiful supply of fuel.

In 2013, the Sancha plant's fuel substitution rate is set to reach 15%, providing a 10% saving on the total fuel cost.

From 2013, "landfill mining" of waste already land filled will increase the substitution rate by 5% a year over the next 10 years.

### PEOPLE CONCERNED

- The municipality of Zunyi • The municipal operator of the sorting and land filling center • Lafarge employees who are contributing to providing an outlet for the city's waste.

## PANEL

**JEAN-PAUL JEANRENAUD**  
WWF



Lafarge has made significant progress in relation to reducing its footprint over the past decade in general, and over the past year in particular, and is now ready to take the next truly ambitious steps towards becoming a company that makes a 'Net Positive Contribution to People and the Planet'. WWF looks forward to working with Lafarge to design and implement a strategic program of activities to make this vision reality.

During the year, our collaboration on Biodiversity and persistent pollutants has been very fruitful, with Lafarge developing ambitious targets and robust approaches to ensure that biodiversity will be maintained and restored on all their sites; and that emissions will be significantly reduced across all their operations. We look forward to seeing these approaches implemented at local level, across the globe.

In June 2011, WWF welcomed Lafarge's commitment to set further ambitious targets for reducing its Greenhouse Gas emissions. These new targets signal Lafarge's willingness to develop large-scale, alternative sources of energy and to move from being a producer of building materials to becoming a provider of sustainable construction solutions. Going forward, we would like to focus our energy, as partners, on identifying ways for Lafarge to come up with unique projects in the field of sustainable construction, beyond their current participation in sustainable buildings.

We would now encourage Lafarge to make these commitments a priority and to come up with clear roadmaps and inspiring targets, especially in relation to biomass and renewable electricity. We would also encourage Lafarge to adopt more progressive public positions on climate policy and WWF stands ready to work closely with them on this topic.

Our joint work on water enabled Lafarge to map the high risk areas for their operations and to establish a robust guide to reduce their water footprint. The logical next step is to implement water stewardship projects in the priority water basins where it is a stakeholder.

We are also delighted to see that the partnership has generated several innovative local projects that are a source of inspiration to others and proof of the dynamism and creativity of the WWF and Lafarge teams in the field.

Most noteworthy, is the fact that even in these times of economic recession, Lafarge has never wavered in its commitment to sustainability and continues to set an example of real business leadership to the world.



# Industrial ecology and recycling

Cement manufacturing consumes large quantities of non renewable raw materials (minerals and fossil fuels). It is also an important source of CO<sub>2</sub> emissions. In response to this environmental challenge, Lafarge has been committed to industrial ecology since the mid-70s by rethinking industrial processes to transform some industries' waste products into other industries' resources.

## Why find uses for waste?

The Group is aware of the impact of its activities on the environment. As a result, Lafarge started thinking at a very early stage about ways of reconciling industrial imperatives with the preservation of ecosystems.

Adding value to waste by using it as alternative fuel or materials makes it possible to:

- limit greenhouse gas emissions by reducing the use of: non renewable natural raw materials, fossil fuels (oil, coal, etc.),
- diversify energy resources and reduce energy costs by limiting dependence on the market for traditional fuels,
- serve the community by recycling waste that would otherwise have to be processed and eliminated.

Within Lafarge, the use of alternative fuels has increased by more than 30% over the last three years. In 2011, 69% of its plants used alternative fuels allowing the Group to reduce its net greenhouse gas emissions per ton of cement by 23.4%.

## Alternative fuels

Waste products can be a very appealing alternative to fossil fuels. In general, alternative fuels are derived from biomass, industrial waste and byproducts:

- coffee husks,
- rice husks,
- palm nut husks,
- scrap plastic, etc.

All of these products can be recycled as alternative fuels and burned safely in cement kilns.

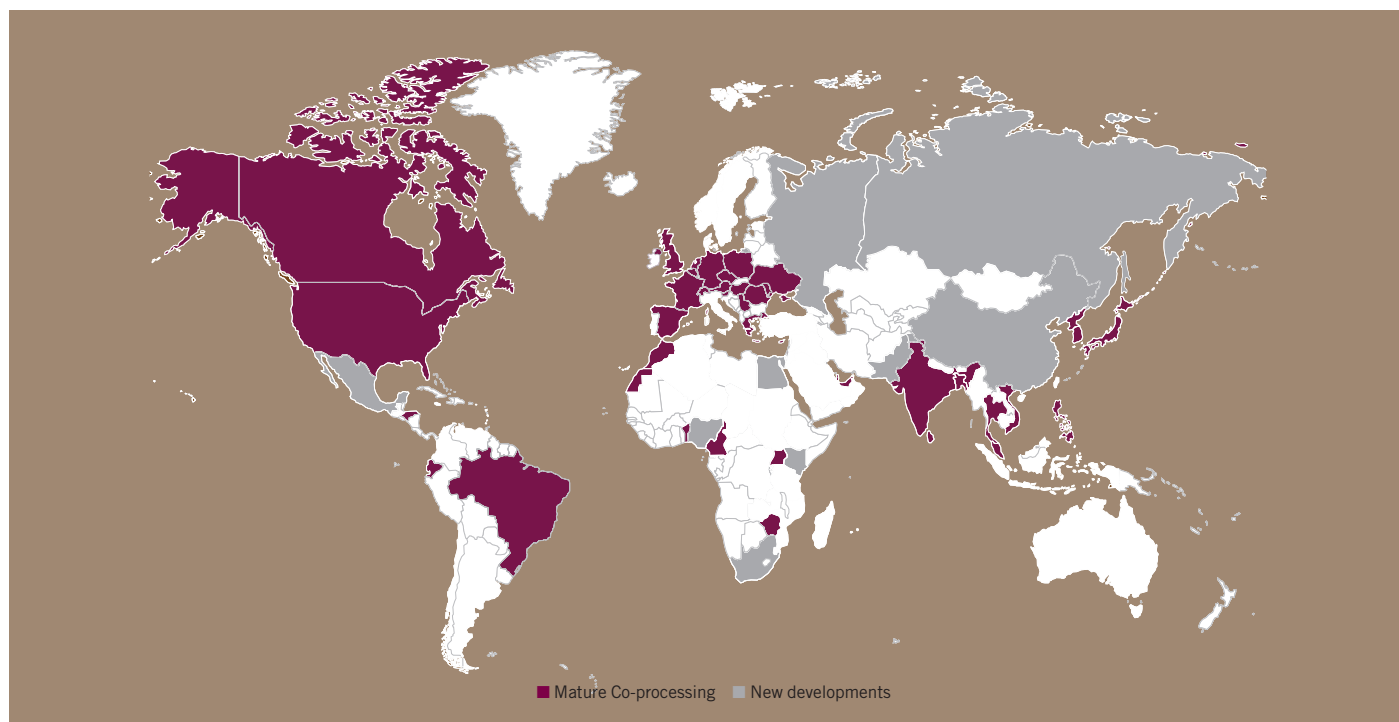
This approach relieves the community of the need to process this waste and helps to limit CO<sub>2</sub> emissions. The extremely high temperatures found in cement kilns mean that the waste is totally eliminated and does not leave any residue.

Lafarge actively participates in the Clean Development Mechanisms (CDM) system initiated under the Kyoto Protocol.

These mechanisms encourage the implementation of best-in-class technologies in developing countries by providing carbon credits to companies which finance sustainable development projects.

For example, in:

- Malaysia, 5% of the thermal energy required for the Lafarge cement plants in Rawang and Kanthan is produced from biomass,
- Morocco, a wind farm provides 50% of the electricity required for the Tétouan cement plant.



“**The biomass substitution program is now in full swing and in the short term many developments are planned in emerging countries.**”

In 2011 we recorded an increase in the substitution of fossil fuels, with 13% of our energy needs for cement production met by alternative sources, such as waste and biomass (versus 11.7% in 2010). This increase is due to a combination of factors:

- development of new waste streams;
- increased percent substitution in plants already using recycled materials;
- expanding this practice to new countries.

Among the new channels is a pilot in Romania started in 2010, for sorting household waste, which will serve as a model for other locations.

With regards to the use of biomass, several achievements were made in 2011, for instance the use of wood in Nigeria, the recovery of energy from animal waste (poultry) in Pakistan and the recovery of energy from agricultural waste in Ecuador.

The biomass substitution program is in now full swing, and in the short term many developments are planned, especially in emerging countries.

### Alternative materials

The cement manufacturing process generates CO<sub>2</sub> because the limestone needs to be heated to very high temperatures. This physical-chemical process of “decarbonization” produces clinker, which is then ground down.

It is possible to reduce the amount of clinker in cement by using alternatives, called cement admixtures.

Reducing the amount of clinker in cement offers two advantages:

- a reduction in the consumption of natural, non renewable raw materials,
- a reduction in the emission of greenhouse gases. A cement produced with 30% admixtures uses 230 kg or 27% less CO<sub>2</sub> than a conventional cement produced without admixtures.

Cement admixtures may be of:

natural origin: limestone or pozzolanic rock,  
industrial origin: waste products from other industries, such as slag from steel-industry blast furnaces or fly ash from coal-fired power plants. These waste products have the same hydraulic binding properties as clinker.

For example, in India, the Arasmata cement plant uses fly ash from power plants in cement manufacture.

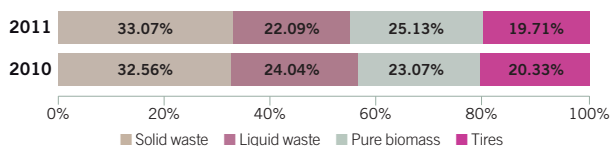
“**We have increased the total materials substitution by 2.3 million tons, contributing to our overall reduction of CO<sub>2</sub> emissions.**”

### Lafarge expertise results in safe waste solutions

The use of waste products cannot be improvised. Lafarge has implemented stringent quality control standards as well as a training policy for its engineers, technicians and foremen. In this way, it is reinforcing the use of alternative fuels and materials while controlling industrial processes. The Group's R&D teams are also making an active contribution in this respect.

The Cement Business considers the use of alternatives and the pursuit of industrial ecology to be separate but complementary parts of its core business. The Business has developed a highly professional strategy as well as expertise and a dedicated organization at Group level and within operational units. The Group also establishes partnerships with local waste management companies. The industrial ecology business consists of 25 companies, often in partnerships, and has activities in 40 countries.

#### Breakdown of alternative fuels



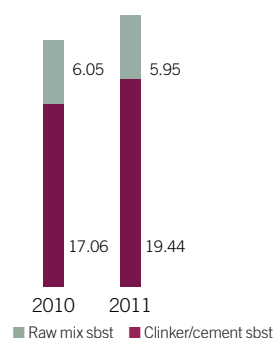
If we take into account the biomass fraction in waste streams, we reach a total of 36% of biomass in 2011:

- Liquid alternative fuels, such as solvents, used oil and hydrocarbons decreased from 24% to 22%;
- The quantities of solid waste and tires has remained stable.



### Alternative raw materials

#### Material substitution in cement



Material recovery in cement manufacturing can occur in two areas:

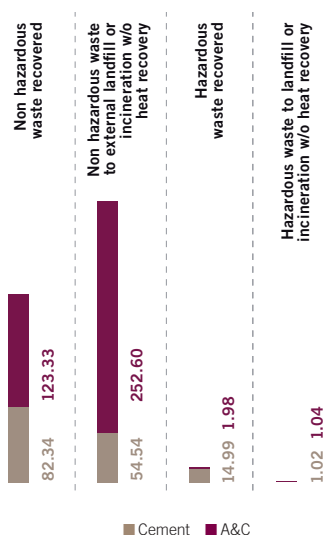
- substitution of the raw materials;
  - substitutes for clinker in finished product (cement).
- In 2011 we increased the total materials substitution by 2.3 million tons, mainly due to finished products substitutes, such as slag and fly ash.

Beyond its economic value, material used for clinker substitution has a direct impact on CO<sub>2</sub> performance, where material substitution is a major lever for reducing emissions.

### Management of waste generated by our activities

#### Waste from operations

(thousand of tons)

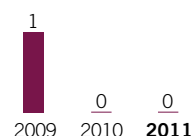


The practice of waste and energy recovery from other industrial and domestic sectors has paved the way for optimal management of the waste we generate on our sites. Dust is the primary waste stream in cement manufacturing and it often can be recycled into the finished product. Around 415,000 tons of

dust were collected from the kiln and recycled into the cement in 2011.

Waste leaving the cement plants and treated outside the sites represents 153,000 tons of which 90% is non-hazardous (137,000 tons). Sixty per cent of this non-hazardous waste stream was recovered in 2011 (82,347 tons). For Cement, 93% of hazardous waste was recovered and only 1,018 tons were disposed of in 2011, all at dedicated installations. For Aggregates and Concrete operations, the waste footprint is similar to that of cement with 99.7% being non hazardous wastes (376,000 tons) and 3,000 tons of hazardous waste with two-thirds recycled and only 1,043 tons disposed of at dedicated installations.

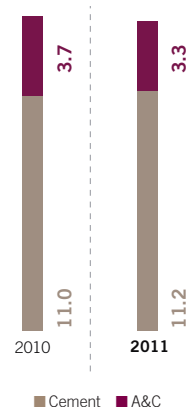
#### Total number and volume of significant spills



For the second year in a row, we report no significant accidental releases of material to the environment.

In 2011 three minor spills were reported which were contained and had no impact on the environment.

#### Percentage of materials used that are recycled input materials



## Serbia

# LAUNCH OF THE FIRST WASTE TREATMENT INSTALLATION



**Lafarge's cement plant in Beočin started the first of its kind waste co-incineration facility in Serbia. This new installation will increase the share of alternative fuels in the plant's energy mix, but it will also provide access to a cheaper energy source.**

### OBJECTIVES

- Reduce the share of fossil fuels in the plant's energy mix;
- Increase the long-term profitability of the activity, with no additional impact on the environment;
- Contribute to the development of waste recycling in Serbia.

### SUMMARY

In March 2011, Lafarge's cement plant in Beočin (Serbia) started the operation of a newly built installation for waste preparation and coprocessing, the first of its kind in Serbia.

The 24,000 t/year capacity installation allows the use of pre-selected, chopped and shredded solid municipal and industrial waste as alternative fuel under controlled coprocessing conditions.

The operation took place in the framework of the Memorandum setting the conditions for the use of certain streams of waste in Serbia, signed with the Ministry of Environment and Spatial Planning.

### RESULTS

So far, 25% of Lafarge BFC fuels came from alternative sources. The recovery and use of waste will replace an additional 11% of fossil fuel in BFC's energy mix!

Lafarge Serbia will have access to lower-cost fuel.

### PROSPECTS

Taking initial operational experience into account, optimization of the line was done stepwise in the past 12 months.

In 2012, full utilization of the line is expected, bearing in mind that the SSW is THE alternative fuel for the future in Beočin.

### PEOPLE CONCERNED

- Teams from the Beočin Lafarge cement plant • Lafarge Serbia • The Serbian Ministry of Environment and Spatial Planning • Local community of Beočin

## Web

### CONSERVING RESOURCES AND RESOURCES RECOVERY

- China** - Replacing fossil fuels with household waste
- Canada** - Lafarge-WWF local partnership for the use of biomass
- United States** - A closed-loop approach to waste management
- USA** - A model in industrial ecology
- France** - Construction of a "High Environmental Quality" building
- United Kingdom** - Recycling bags of cement
- USA** - Double recycling
- United Kingdom** - More environmentally-friendly plastic bags
- South Korea** - Recycling gypsum for the Cement Business at Okke
- Brazil** - Energy recovery from gypsum residue for cement
- China** - Energy efficiency in a cement plant
- Germany** - Solar energy use
- India** - Recycling industrial products
- United States** - Recycling slag
- South Africa** - Use of synthetic gypsum
- United States** - Using synthetic gypsum
- South Korea** - Conversion to natural gas
- France** - Recovery of miscellaneous industrial waste
- France** - Energy recovery from meat and bonemeal
- Malaysia** - Biomass to energy
- UK** - Partnership for industrial waste recycling
- UK** - Green energy from biogas
- Uganda** - Energy recovery from coffee husks
- Japan** - Energy recovery from meat and bonemeal
- South Korea** - Recycling scrap tires
- Malaysia** - CDM project
- Uganda** - Example for reducing CO<sub>2</sub> emissions
- France** - Recycling return concrete
- Greece** - Reclamation of red mud
- UK** - Recovery of construction site waste
- United States** - Recycling scrap tires in an urban environment
- Philippines** - Energy recovery from rice husks
- Morocco** - Recycling fly ash
- Austria** - Using plastic as alternative fuel

# Managing our emissions

Although all of our Sustainable Ambitions 2012 targets were achieved last year, we have continued to make progress and are now setting new more ambitious targets for the future.

## Reducing emissions

Regulators in many areas of the world continue to be concerned over unhealthy levels of smog in urban areas and have tended to look to the industrial sector, where it is easier to implement change compared to transportation, as a source of reduction. Whether through legislation, regulation, permit renewals, or bi-lateral agreements with companies, we see targeted levels for NO<sub>x</sub> (and in some cases particulate) being lowered. The regions where we see the most activity in this regards are the USA, Europe, and China, with emerging concern also being expressed in many other areas such as India and Russia. For NO<sub>x</sub>, as we expand our utilization of alternative fuel, especially wet biomass, we have seen large reductions in our emissions.

For dust, we had numerous new dust collectors or upgrades start which replaced older non-performant equipment (Russia, Pakistan, Ukraine, Nigeria). This continues our program to address emissions that meet local regulations, but not our internal standards.

At the end of 2010 we completed our program of having a fingerprint of emissions for mercury and

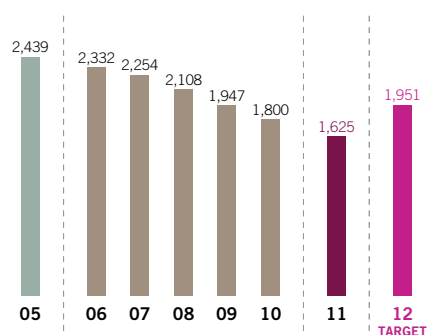
dioxins. In 2011 our focus was on ensuring the quality of all measurements as the nature of these materials and the very small specific concentrations require rigorous testing which has been a challenge in some emerging countries. Our program with WWF has also been addressing some kilns with higher than average emissions and although the results of these actions are not yet evident in our stack emission reporting, we are confident we will see improvement in our 2012 results.

## And looking ahead

Our operations in the USA continue to implement necessary upgrades to comply with regulatory requirements and other commitments to reduce air emissions and stormwater. Results from this new equipment should start to be seen in 2012 with further reductions in later years. In emerging countries we are also continuing our program of upgrading dust collectors that do not meet our standards and a number of new systems are scheduled for start-up in later part of 2012 and in 2013.

### NO<sub>x</sub> emissions\*

(g/ton clinker)

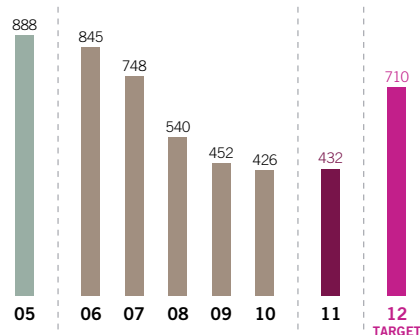


\*For all emissions, the Group has modified the calculation method for current and past data to reflect the latest CSI protocols (see Reporting methodology).

There has been a reduction of 33% in NO<sub>x</sub> emissions since 2005, more than the targeted reduction of 20%. The total amount of NO<sub>x</sub> emitted in 2011 was 190 thousand tons.

### SO<sub>2</sub> emissions\*

(g/ton clinker)

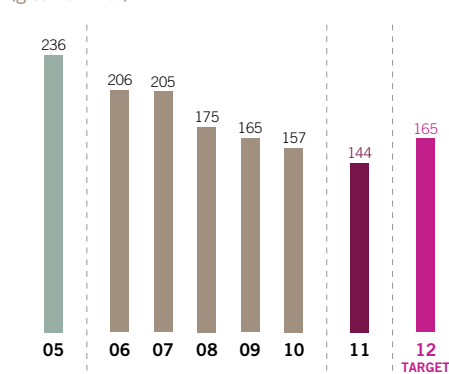


\*For all emissions, the Group has modified the calculation method for current and past data to reflect the latest CSI protocols (see Reporting methodology).

There has been a reduction of 51% in SO<sub>2</sub> emissions since 2005, more than the targeted reduction of 20%. The total amount of SO<sub>2</sub> emitted in 2011 was 50 thousand tons.

## Stack dust emissions\*

(g/ton clinker)



\*For all emissions, the Group has modified the calculation method for current and past data to reflect the latest CSI protocols (see Reporting methodology).

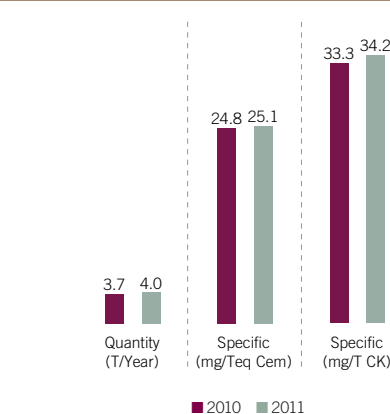
There has been a reduction of 39% in dust emissions since 2005, more than the targeted reduction of 30%. The total amount of stack dust emitted in 2011 was 16 thousand tons.

## Persistent pollutants and VOC <sup>(1)</sup> Reporting

Mercury continues to be an important subject in the cement industry. In 2011, the United Nations Environment Program approved a Cement Mercury Partnership in the framework of developing a "Globally Binding Instrument on Mercury". In the United States new regulations were adopted towards the end of 2010 that require emission reductions by 2013. While these civil society processes have recently gained speed, Lafarge has continued its 10-year work with WWF to understand and reduce mercury and dioxin/furan emissions from our kilns.

(1) Volatile Organic Compound

## Mercury

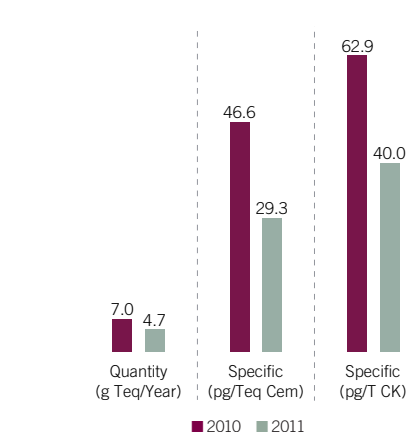


\*For all emissions, the Group has modified the calculation method for current and past data to reflect the latest CSI protocols (see Reporting methodology).

For mercury, our results in 2011 are very similar to those of 2010. Action plans have been implemented to reduce emissions at a number of kilns, but as these actions took place throughout the year, the results are not yet evident in our reporting.

For mercury, in 2011 we found one plant for which poor analysis resulted in very high emissions reported in 2010 and we have restated here the correct 2010 emissions.

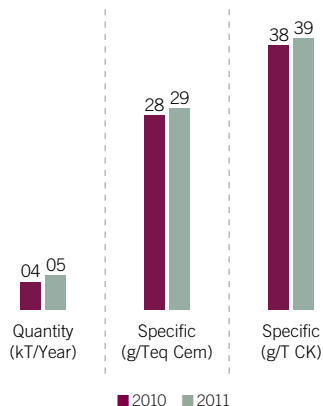
## Dioxin/Furans emissions



\*For all emissions, the Group has modified the calculation method.

One of the biggest improvements in 2011 is the quality of the data we are collecting, particularly from emerging countries. Persistent pollutants are emitted in trace quantities and they can be very difficult to measure. Lafarge released a new measurement protocol at the beginning of 2011 to address what we saw as the difficulty encountered in some countries to measure these constituents accurately. As we now have a higher level of confidence in the tests being performed, we have adopted the CSI's new protocol for reporting the last measurement for mercury and dioxin/furans.

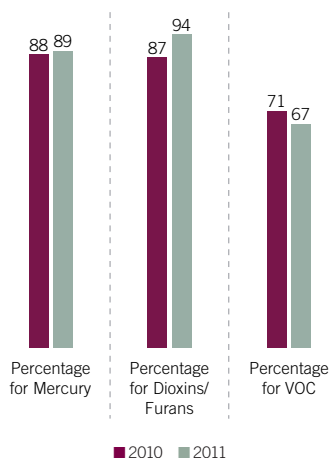
## Volatile Organic Compound



\*For all emissions, the Group has modified the calculation method for current and past data to reflect the latest CSI protocols (see Reporting methodology).

## Analysis of kilns for micro pollutants

Proportion of kilns analyzed for micro-pollutants (%)



In 2010 Lafarge completed a program to have at least one measurement for mercury and dioxin/furan for all kilns which have been in Lafarge for a minimum of 3 years. As 100% of kilns meeting this criterion have been analyzed, this year we present data concerning the percentage of all kilns analyzed, even those new to the Group.

## Heavy metals

Heavy Metals' emissions	Absolute emissions kg/year	Specific emissions mg/t KK	Coverage %
HM1 Emissions: Cd+Ti	4,120	35.2	44%
HM2 Emissions: Pb+As+Co+Ni+Sb+Cr+Cu+Mn+V	125,451*	1,071	45%

\* Mn and Sb account for 57% of HM2.



## Ukraine

## MYKOLAIV CEMENT SUCCESSFULLY COMPLETES UPGRADE OF ITS KILN ESPS

Mykolaiv Cement Plant was built in 1950 and acquired by Lafarge in 1999. Most of the plant's wet line equipment has been operational for over 60 years.

At the end of 2010, Lafarge Mykolaiv cement started the implementation of a new environmental project: Reconstruction of the ESPs of four rotary kilns with a Capex allocated of 2.850k euro.

The scope of the project was similar for all Kiln ESPs: keeping the housing and support structure, exchanging internal filters and electrical components

- Discharge electrodes including Rapping system
- Collecting Electrodes including Rapping system
- Gas Distribution Inlet
- Transformer and Rectifier Set
- Monitoring and Control System

which were required to achieve the dust emission performance figures.

The companies used were ELEX as well as the local company Rensy. The period of reconstruction of the different ESP was from Sept 2010 until March 2011, with a staggered scheduling according to the Kiln Winter Stoppages.

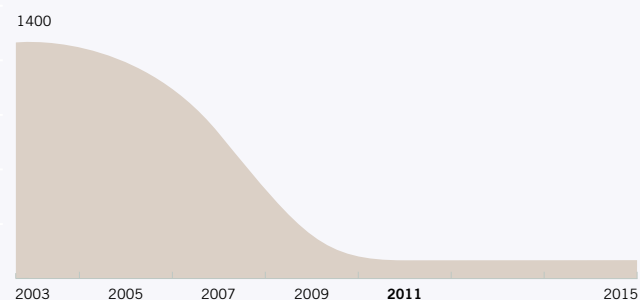
The aim of this project was to reduce the volumes of emissions of dust well below the norms stipulated by the new Ukrainian legislation as well as to meet more strict EU standards.

The improvement became obvious right after the implementation of the project, the dust emissions went down by more than 60%. Today, normal operating modes are below 50 mg/m<sup>3</sup> for the kilns fed with alternative fuels and below 150 mg/m<sup>3</sup> for kilns in which no alternative fuels are burned.

Today the Ukrainian law sets the emission limit at 800mg/m<sup>3</sup> for kilns without AF.

## Kiln dust emissions overview

Emissions rate mg/Nm<sup>3</sup>



Drastic reduction in dust emissions as a result of the modernization of the dedusting equipment.



## South Africa

# REDUCING MERCURY EMISSIONS

Solving a problem of high mercury emissions in a plant

### THE CASE:

Lafarge in its partnership on persistent pollutants with WWF prioritizes plants in the 90<sup>th</sup> percentile of the Lafarge plant population for inclusion in a dedicated program to develop and implement action plans for mercury and dioxin/furan reduction. In 2010, a plant operating in a region with no mercury regulations was selected in 2010 due to annual measurements which qualified it as one of Lafarge's highest emitting plants.

Although the emissions were high, the plant was unsure of the cause as its raw materials did not show particularly high mercury. Upon investigation, it was found that the normal cement plant quality control equipment being used for the measurements was not accurate enough to detect the level of mercury in the raw materials that could potentially be contributing to the problem. Outside lab analysis of the materials indicated that the mercury level in some of the materials may also be variable requiring on-going quality assurance testing. The first step in the program was to purchase a special analyzer for the plant and train the plant personnel in its use. Due to the large number of raw materials used by the plant, a special microwave digester was also purchased to save time in the preparation of samples and have a safer operation so that all materials could be tested on a regular basis. By April 2011 the new analyzer system was properly functioning.

Each raw material and fuel is now routinely tested and tracked using the standard Lafarge resource recovery qualification form.

Through this process one iron containing raw material appeared to have a high mercury level. The supplier actually has several materials from its other plants with lower mercury levels that could easily be substituted for the high mercury bearing material. The high mercury bearing material use was stopped and other materials substituted.

The plant now has a rigorous approach to regularly monitoring all its raw materials and fuels. The analyses are kept in a database where minimum, maximum, average, and standard deviation of component levels are automatically calculated and form part of the quality control history of the materials.

Concurrently, the plant also increased the frequency and quality control of its stack testing. Complete mass balances for mercury were carried out with each quarterly stack test to understand mercury behavior in the system and emissions.

### RESULTS

Through this process, 2011 mercury emissions are approximately half the level seen in 2008 and the plant continues to make reductions. Applying the standards developed in the Lafarge-WWF persistent pollutant partnership has not only resulted in reduced emissions from this plant, but reduces the risk that any materials that could contribute to high mercury emissions are not accepted by the plant.

## Web

### PROTECTING AIR QUALITY AND MITIGATING DISTURBANCES

- Romania** - Reducing NO<sub>x</sub> emissions
- Russia** - Reducing dust emissions
- Scotland** - Investing in sustainability and improved performance
- France** - Stack gas defluorination
- Nigeria** - Cleaning and restoring a cement plant
- China** - Construction of a model cement plant
- United States** - Cement plant modernization project
- Poland** - Reducing dust emissions
- Germany** - NO<sub>x</sub> reduction
- Brazil** - Plant cleanliness, safety and appearance

# Biodiversity at our sites

Lafarge is working with local experts and environmental associations to establish biodiversity programs for all sites located in sensitive areas.

## Protecting biodiversity

The Group's operations affect ecosystems. Therefore, for many years, biodiversity has been a long standing key focus area for Lafarge, which was one of the original work streams in its partnership with WWF. In this framework, Lafarge has been actively rehabilitating its quarries to restore and create new habitats. The goal is now to broaden this approach by also looking at improving biodiversity on all Lafarge sites.

### A biodiversity management system

Lafarge has updated its long established comprehensive biodiversity management system in partnership with the WWF which now includes:

- a new methodology of assessing sensitive sites using IBAT, which is used in addition to the checklists developed.
- a range of tools to evaluate the challenges of the site and tools to help manage biodiversity at site level,
- a comprehensive internal guidance manual on biodiversity which includes case studies for all types of Lafarge sites,
- programs to maintain and improve biodiversity,
- educational material for site visitors to raise awareness of biodiversity.

The objective is to work with local experts and environmental associations to establish biodiversity programs for all sites located in a sensitive area or presenting real potential for wildlife.

In partnership with the WWF and IUCN France in 2011, Lafarge has developed a new range of tools to monitor and track ecological changes at the Group's quarries and sites.

### Partnerships with specialists

Lafarge works closely with specialists to expand its understanding of biodiversity:

- A panel of experts and stakeholders is consulted in all biodiversity matters.
- International experts: the indicators developed with WWF have been reviewed and have inspired key performance indicators for the CSI (Cement Sustainability Initiative).
- Local experts such as:
  - the "Musée d'histoire naturelle" (France) and English Nature (United Kingdom) lend their expertise during the creation of natural habitats on rehabilitated sites,

- the Wildlife Habitat Council (United States) has recognized the attention to biodiversity shown in the Group's industrial approach by certifying 74 of its Cement and Aggregates sites.

### 2011 UN Year of Forests

The United Nations designated 2011 as the year of the forests where they celebrated people's actions for sustainable forest management. To acknowledge this and to further Lafarge's commitment to biodiversity we were involved in several projects which related to forestry. A few examples of these included "Green Chhattisgarh" around the Sonadih and Arasmata cement plants in India. A total of 70,000 tree saplings were planted as part of this local program. The species were chosen following advice from local authorities and NGOs and included teak and tamarind and fruit trees such as mango and jackfruit. The planting was done in partnership with local communities, particularly school children, in order to raise their awareness of environmental issues. Other projects included a partnership between Lafarge Aggregates Poland and Warsaw University of Life Sciences working closely with the National Forestry department to improve techniques for forest restoration at Sepolno quarry. This included a joint seminar to present the results in October 2011. In Spain the cement operation produced a pictorial book on forests within Spain territories to raise awareness of the importance and beauty of their forests.

### Raising Awareness on Biodiversity

To continue to raise awareness of biodiversity within Lafarge we developed a guidance manual jointly with WWF International and our International Biodiversity Panel members. The manual not only explains what biodiversity is and why it is of importance to us all, but also how we can better manage it. It includes examples of how biodiversity is managed at different types of sites including offices, cement works, concrete plants and quarries. Externally we continued to promote the importance of biodiversity by producing a leaflet for visitors of our sites. This leaflet includes examples of what each of us can do to play our part in trying to halt the loss in biodiversity. Lafarge also contributed to the development of two guidelines by WBCSD for corporate ecosystem evaluation and by WBCSD CSI on quarry rehabilitation, both of which contain new Lafarge case studies.



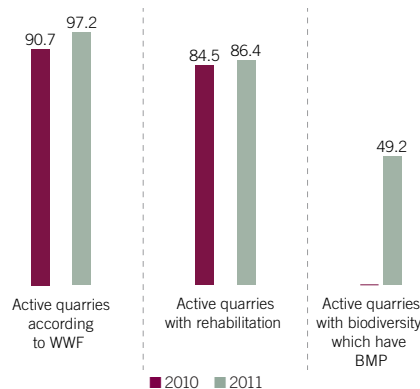
“Lafarge mapped the location of all its quarries for biodiversity sensitivity using the “Integrated Biodiversity Assessment Tool” (IBAT).”

#### Progress on Group Ambitions and Additional Screening for Biodiversity

In what was a difficult year due to the political and economic events in many of the countries in which we operate, we continued to make progress towards our Group Ambitions for rehabilitation and biodiversity.

Building on the screening program we implemented using our checklists developed with WWF, in 2011 Lafarge mapped the location of all of its quarries and screened them to confirm all of those that are located in or within 500m of an internationally protected areas using IBAT\* (Integrated Biodiversity Assessment Tool).

#### Progress towards Group ambitions for rehabilitation and biodiversity



\* Due to the change in screening tool it was not possible to give an equivalent value for 2010.

#### Progress with ambitions for rehabilitation and biodiversity

Number of Quarries: 723		2011 Achievement
Quarries with rehabilitation plans (target 85% by 2010)		86.4%
Quarries that have completed biodiversity screening (using WWF validated checklist) (target 100% by 2010)		97.2%
Quarries screened for international biodiversity sensitivity using IBAT*		97.6%
Quarries which operate within or adjacent to a protected area**		18.3%
Quarries which operate within or adjacent to a protected area** with site biodiversity programs (target 100% by 2012)		49.2%
Biodiversity Checklist results		
Quarries which have red-listed species***		19.0%
Quarries engaged in formalized partnerships with NGOs for nature conservation		28.6%

\* IBAT a world database of protected areas developed by IUCN, Birdlife, UNEP, Conservation International and WCMC.

\*\* Quarries within 0.5km of IUCN I – VI, Ramsar, IBA, Natura 2000.

\*\*\* A species categorized by the IUCN as threatened.

### Lafarge and quarry management

Lafarge operates over 720 active quarries around the world. From the selection of sites to their rehabilitation, the Group makes quarry management a priority.

#### Selecting sites

Before opening a new quarry, Lafarge:

- develops dialogue with local residents, associations and experts to identify the best location for quarrying,
- performs an environmental impact study which pays close attention to biodiversity at each stage of the quarry's life (from extraction to rehabilitation).

If a project turns out to be dangerous for the environment, it is put on hold or special measures are taken. These could include:

- transferring fragile species to a safe place,
- closing part of the site,
- designating the site as a nature reserve.

#### Limiting disturbances for local residents

Extraction operations cause disturbances at a local level, such as noise, vibrations, changes to the landscape and traffic transporting materials from the quarry to the work site.

Lafarge constantly seeks to reduce these impacts even as it responds to local and national needs for building materials. The Group has developed solutions to:

- reduce dust emissions,
- limit noise and vibration in quarries and surrounding areas.

Although the Group strives to keep disturbances to a minimum, the development of a quarry can generate hostile reactions and opposition.

Lafarge commits to communicating with local communities and to demonstrating its capacity to preserve the environment (for example, by explaining how quarries are rehabilitated).

**“97% of the Group's active quarries have been screened according to criteria validated by WWF.”**

#### Rehabilitating quarries

The quarry rehabilitation policy was developed in partnership with WWF in 2001.

It is designed to limit the traces of extraction and bring life back to the area. For example, a quarry could be transformed into a nature reserve or a leisure zone. In 2011, more than 780ha of quarry land were rehabilitated.

At the end of 2011, 97% of the Group's active quarries had been screened according to criteria validated by WWF, 98% had been screened using the IBAT tool and 86.4% of active quarries had rehabilitation plans. These results demonstrate that we exceeded our commitment as part of the 2012 Sustainability Ambitions target for rehabilitation plans and are close to meeting our target for screening.



## Poland

# FERTILIZING AND REFORESTING MORE NATURALLY AND EFFICIENTLY

In Poland, Lafarge has developed a new reforestation technique in partnership with the Faculty of Forestry at Warsaw University of Life Sciences. Sepolno Aggregates & Concrete/Poland

### OBJECTIVES

- Speed up the re-growth of trees as the quarry is mined and rehabilitated;
- Preserve the ecosystem of large Polish forests and facilitate the reintroduction of animal and plant species into the region;
- Speed up handover of the land to the owner, the Polish State Forests - National Forest Holding.

### SUMMARY

In Sepolno, Lafarge has developed a new reforestation technique in partnership with the Faculty of Forestry at Warsaw University of Life Sciences. Following a soil study carried out by scientific experts, Lafarge Aggregates Poland decided to take a “layered” approach, as in nature. The layer of humus and the two subsequent layers are removed one by one prior to mining works. These layers of earth are then stored separately and replaced in the correct order. Woodchips made of branch and root are also added as a natural fertilizer.

### RESULTS

The replacement of soil in successive layers has made it possible to speed up reforestation by skipping the intermediary stage of growing lupins (a leguminous plant known for its ability to fertilize soils in nitrogen). Alongside traditional pine woodland, several varieties of broad-leaved trees - which are more demanding to soil quality - have been planted. The new, more efficient and environmentally-friendly technique also saved €125,000 in 2011.

### PROSPECTS

The scientists at the Faculty of Forestry and the Polish State Forests are continuing their analysis and follow-up work at Sepolno. The technique will be shared with other Lafarge quarries in Poland also located in wooded areas. The initiative has been welcomed by the country's scientific community and Lafarge has already taken part in several conferences to present its work.

### PEOPLE CONCERNED

- Lafarge Aggregates Poland
- The Faculty of Forestry at Warsaw University of Life Sciences
- The Polish State Forests - National Forest Holding

## United States

# AN EDUCATIONAL APPROACH TO PRESERVE BIODIVERSITY



For nearly 10 years, the Churchville quarry in Maryland has been raising awareness of biodiversity preservation among employees, communities and students. And the results are categorical!

### OBJECTIVES

- To improve and preserve the habitat of flora and fauna present inside and around the quarry.
- To raise the local community's awareness of biodiversity preservation through educational initiatives.

### SUMMARY

The Churchville quarry in Maryland (United States) has set up 2 programs to raise awareness of biodiversity:

- Wildlife at Work, created in 2001, aims to establish projects and initiatives to promote preservation of ecosystems and is designed for employees and local communities;
- Corporate Lands for Learning was established in 2009 with the aim of developing an educational program for schools and local scout clubs regarding the importance of preserving biodiversity.

In the context of these programs, the Churchville quarry has set up several initiatives to involve community members, in particular:

- The implementation of bluebird boxes,
- The creation and maintenance of a pollinator garden,
- Maintaining a reclamation area.

### RESULTS

In collaboration with the various projects initiated by Lafarge, students and scouts visited the quarry to monitor the initiatives. This was also an opportunity to learn about the results obtained. The quarry is now full of plant and animal species of all kinds. Inventories are conducted regularly to keep track of their numbers. There are currently no fewer than:

- 70 species of plants,
- 26 species of birds,
- 8 species of reptiles,
- 10 species of mammals.

### PEOPLE CONCERNED

- Lafarge employees in Churchville • Harford County students • Local scout clubs.

## Ecuador

## OPTIMIZING LIMESTONE EXTRACTION PROCESS



When Lafarge bought its operations in Ecuador in 2005, it received a limestone quarry, located about 60 km away from the plant (2 hours by car on a poorly kept public road), with a rudimentary extraction process that had been in place since the quarry was first set up over 30 years ago.

## Concerns about the situation

This process involved the limestone being blasted at the top of the mountain and then pushed down the side of the mountain, a drop of close to 400m, where it is then transported to the grinding station at the mountain's base. This extraction process has been a concern for Lafarge and for some local Ecuadorian environmental organizations over the past years.

## What are Lafarge's actions?

To change this extraction process and optimize environmental and industrial safety management at the quarry, Lafarge made a \$14 million investment to modernize the quarry's operation, the Glory Hole / Quinde Project. The project consists of building a 400m long tunnel inside the mountain, through which the limestone extracted from the top layers of the mountain will be transported to the bottom of the mountain, the grinding will take place at the top of the mountain. Transporting the limestone internally, through the tunnel will reduce the dust and noise, associated with the current (rolling-down-the-hill) process and improve industrial safety, as well as reduce the visual impact of the quarry. Ground-leveling work was done in 2011 and the tunnel's construction itself was begun in early 2012.

In addition to Glory Hole / Quinde project investment, Lafarge Ecuador also operates a wide-scale community relations program in the quarry area. Actions include support for income generation projects, preventive healthcare and infrastructure improvement. An important income generation activity, for example, is the transport of limestone from the quarry to the plant located 60km away, for which Lafarge grants transport quotas and provides advice to community members in the setting up of micro-enterprise transport companies. Lafarge has also developed a Road Safety program "Volante Seguro", which includes community transport service providers, to ensure that they are well prepared for driving safely. Currently, close to 30% of the limestone transport is done by community transporters, enabling them to nearly double their monthly and benefit from Lafarge's core business itself.

## Web+

## BIODIVERSITY AND QUARRY REHABILITATION

**Poland** - Fertilizing and reforesting more naturally and efficiently  
**Greece** - A long-term landscape restoration  
**China** - Revegetation and rehabilitation of quarries  
**Morocco** - Rehabilitating a quarry into an olive and honey farm  
**Korea** - Lafarge awarded the Landscape Architecture Grand Prize  
**Romania** - Creation of a biodiversity area  
**Greece** - Promoting the use of pumice stone in farming  
**India** - Reforestation program  
**Cameroon** - Reforestation for biodiversity  
**Russia** - Reconciling quarry rehabilitation with preserving the ecosystem  
**Canada** - Rehabilitation of Brookfield quarry  
**Greece** - A partnership for biodiversity protection  
**United States** - Implementation of an ecosystem valuation model  
**Romania** - Partnership with WWF to rehabilitate the Fusea quarry  
**Canada** - Protection of biodiversity on Texada island  
**Canada** - The successful rehabilitation of the South Pit quarry  
**United Kingdom** - Ecological rehabilitation and tourism with WWF  
**United Kingdom** - Triple environmental distinction  
**Spain** - Enhancing biodiversity through a quarry restoration  
**United Kingdom** - From aggregates quarrying to farming  
**United States** - Environmental restoration and residential development  
**Germany** - A vineyard in a quarry  
**United Kingdom** - Whisby Nature Park  
**France** - Rehabilitation in a peri-urban setting  
**France** - Rehabilitation and quarrying  
**France** - Rehabilitation and dialogue with stakeholders  
**South Africa** - A mutually beneficial rehabilitation program  
**Venezuela** - A plant nursery and showcase restoration  
**Germany** - Protecting sand martins  
**France** - Ornithological observatory  
**Jordan** - Protection of a nature reserve  
**Greece** - Tree nurseries and quarry rehabilitation  
**Austria** - Long-term biodiversity indicator  
**France** - Flood control  
**Canada** - Coordinated rehabilitation of a quarry in a protected area  
**Kenya** - Protecting biodiversity  
**France** - Creation of a wet meadow  
**France** - Extension of a natural site  
**Kenya, Uganda** - Lafarge awarded

# Water footprint

Over the past two years, the United Nations, governments around the world and companies have greatly increased their attention to the world's supply of fresh water and have recognized access to safe drinking water and sanitation as a human right.

The situation in regards to water varies drastically by geography with water stress increasing in many areas of the world and other areas with abundant supplies.

In 2011, Lafarge progressed further in its understanding of the water footprint on our sites and has changed its approach to prioritize its actions according to each site's "water risk."

## Summary of Lafarge water footprint

Total water withdrawal by source								
(in million cubic meters)								
	2011				2010			
	Cement	Aggregates	Concrete	Total	Cement	Aggregates	Concrete	Total
Surface water including from rivers, lakes, wetlands and oceans	187.5	23.1	1.0	<b>211.6</b>	169.8	11.2	1.2	182.2
Ground water	24.3	14.7	3.3	<b>42.3</b>	23.3	69.3	3.5	96.1
Rainwater harvested	2.4	12.8	0.5	<b>15.7</b>	-	23.2	0.2	23.4
Municipal water supplies or other water utilities	6.9	1.2	4.9	<b>13.0</b>	9.1	0.8	4.6	14.5
Total withdrawal*	221.2	51.7	9.6	<b>282.5</b>	202.3	104.5	9.5	316.2
Water returned to same catchment area	161.7	0.0	0.0	<b>161.7</b>	142.3	0.0	0.0	142.3
Net Withdrawal	59.5	51.7	9.6	<b>120.8</b>	60.0	104.5	9.5	174.0

\* According to GRI G3 EN 8

(in million cubic meters)						
	2011			2010		
	Cement	Aggregates	Concrete	Cement	Aggregates	Concrete
Net withdrawal	59.5	51.7	9.6	60.0	104.5	9.5
Consumption	50.1	21.6	9.5	47.6	39.3	9.4
Discharge	9.3	30.1	0.1	12.4	65.2	0.1

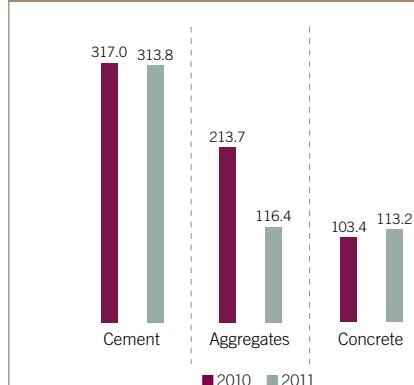
Our work in 2011 has identified several situations where water withdrawal had previously been overestimated, especially by including quarrying dewatering as withdrawal water for future use, which is not the case since this water is returned to the same aquifer from which it was taken. Of the 174 million cubic meters net water withdrawal reported for 2010, only 118 million cubic meters corresponded to a net levy for use by our sites. The net water withdrawal in 2011 was of 121 million cubic meters. 16 million cubic meters was withdrawn from recycled water networks fed with rainwater, corresponding to 13% of the net withdrawal.

“A quarter of our cement production takes place in areas where there is high water stress.”

### Specific water consumption

The performance of specific consumption of water per ton of cement in 2011 (314 l/t) is influenced by two new in-house captive power plants that consumed 2.5 million cubic meters of water that were added to the consumption of the cement sites.

### Specific water consumption



### Fresh water consumption

#### Fresh water consumption by scarcity areas

Annual Renewable Water Supply per Person (Projections for 2025) (cubic meters/person/year)	Total Freshwater Consumption (million cubic meters/year)	Teq Cement (million tons)	Freshwater Consumption per ton of Cement (L/year/t cement)	% of Production	% of Freshwater Consumption
<500	9.3	34.9	266	21.8%	19.4%
500 – 1,000	0.3	5.3	61	3.3%	0.7%
1,000 – 1,700	3.9	23.6	165	14.8%	8.1%
1,700 – 4,000	19.4	56.8	342	35.6%	40.7%
>4,000	14.9	39.2	379	24.5%	31.1%
<b>Total</b>	<b>47.8</b>	<b>159.8</b>	<b>299</b>	<b>100%</b>	<b>100%</b>

A quarter of our cement production takes place in areas where there is high water stress (categorized as stress and high stress).

This is an ongoing challenge that must be addressed, especially since the Group has a strong presence in these regions with the expectation of further development.

Fresh water consumption (surface water and groundwater) in these regions represents almost 10 million cubic meters or 20% of the total water consumption for cement (corresponding to 25% of production).

Although the specific consumption of fresh water in these water stressed regions of 239 l/t cement, is well below the Group average of 299 l/t cement (freshwater), progress is still possible and remains a priority of our Water Program.

### Water program

The actions undertaken in 2010 in areas with high water stress (<500 cubic meters Renewable Water Supply (RWS)/year/person) continue.

For cement, three sites in the Philippines located in areas of water stress ([500-1,000] cubic meters RWS/year/person) have joined the pilot program to establish detailed water balances, to describe water networks and to identify action plans to reduce their water footprint.

In 2011 the program was expanded for deployment to aggregate quarries. Ninety-four quarries have been identified as areas of stress or high stress, or 15% of aggregate quarries. Of these 94 quarries, in 2011, 36 quarries worked within our program for the development of a water action plan. The program for all sites will be completed in 2012-2013.



## Rainwater

To support the deployment of this program, a compendium of good water management practices has been developed and shared within the Group. The practices include actions to reduce consumption by recycling water, cutting waste, and the substitution of recovered/recycled water for fresh water, including rainwater.

In countries with high water stress, where the availability of fresh water is critical, the total or even partial recovery of rainwater is a permanent solution to limit aquifer water withdrawal.

Within the Group, several installations of rainwater harvesting have been promoted as a model to limit the use of fresh water. In Britain, five cement plants use rainwater as the sole source of supply: 1,260,000 cubic meters of fresh water are saved in this way every year.

We continue the implementation of these good practices in priority in areas with high water stress.

## Water for communities

Our commitment to respect the communities where we operate is also reflected in our water program where we respond and develop partnerships for joint management of the water resource.

In 2011, we created and started to use a KPI to track and measure the amount of water provided by our sites to communities for ecological (agriculture, among others) or domestic use.

At a Group level, a total of 2.7 million cubic meters of fresh water was provided to neighboring communities. There are examples in Algeria, Jordan, Philippines and China.

Although the results remain modest for now, we expect short- and medium-term increases of such initiatives especially in areas with high water stress.

“In Britain, five cement plants use rainwater as the sole source of supply.”



## Romania

# MEDGIDIA PLANT

**As part of its partnership with WWF, Lafarge has made the preservation of water resources one of its priorities. The Medgidia cement plant, in Romania, was one of the first sites to measure and reduce its water footprint. Medgidia Cement/Romania**

## OBJECTIVES

Despite being close to the Danube-Black Sea canal, the Medgidia site is located in a zone where drinking water resources are scarce due to the fragility of the water table.

From this perspective, it was important:

that all the plant's employees and subcontractors should be aware of the scarcity and challenges affecting the resource, especially considering that the site recorded twice the average consumption of Lafarge cement plants;

- to identify all the uses of water at the site;
- to measure the local environmental impact;
- to plan ways of reducing this impact;
- to contribute to better management of water by all local users (communities, local government, etc.).

## SUMMARY

The plant measured its “water footprint”, i.e. its water consumption, as well as the amount of water lost into the air (vapor), into pipelines and into the canal.

Although it complies with temperature, acidity and pollution standards, the discharged water has an impact on local resources since it does not directly return to the water table from which it was pumped.

The teams therefore considered practical changes they could make and a dialogue about water was initiated with users and local authorities.

## RESULTS

In a few months, the site's water footprint was cut by 43% by improving processes and equipment, particularly the installation of water shut-off valves.

A communications campaign, in association with NGOs, raised awareness among local communities, particularly schools, of the scarcity of water resources in their region.

The Group also funded the drilling of a well in its limestone quarry, to enable the neighboring community to connect a drinking water network.

## PROSPECTS

Teams are now considering ways to introduce even more efficient management of resources. For instance, there are plans to introduce a closed circuit for water, by creating shorter cooling loops to limit discharges, and to use steam to operate power turbines. As well as energy production, this work could reduce the quantity of water required to cool discharges. These measures will require investment.

## PEOPLE CONCERNED

- Plant employees and subcontractors
- Local authorities and managers of the Danube-Black Sea drainage basin
- Local communities
- NGOs

## United Kingdom

## A CEMENT PLANT SELF-SUFFICIENT IN PROCESSING WATER



**Lafarge's British Cauldon cement plant no longer needs to abstract fresh water from a nearby river, thanks to the creation of an artificial lake and a closed loop water recycling system. Cauldon Cement / United Kingdom**

### OBJECTIVES

• Find an alternative water source in order to stop drawing on natural fresh water resources • Increase volumes of water from rainwater recovery and recycling of used water • Help protect the site, on the edge of the Peak District National Park, in consultation with local communities.

### SUMMARY

The River Hamps is a unique natural site labeled a British 'Site of Special Scientific Interest' and 'Special Area of Conservation' and an EU 'Special Conservation Area'. Each summer, parts of the river dry up on the surface and become subterranean, which can become an issue in times of drought.

In order to eliminate the need to draw water for its process from this river, Lafarge Cauldon Works (United Kingdom) "killed 2 birds with 1 stone": the lake created by the rehabilitation plan drawn up for part of its quarry was used as a fresh water reservoir. This artificial lake, which operates on a closed loop system, is fed by rainwater recovery and recycling of the site's used water. It has allowed the plant to no longer depend on natural fresh water resources. As a result, the 300,000m<sup>3</sup> drawn from the River Hamps in 2006 was down to 0 in 2009!

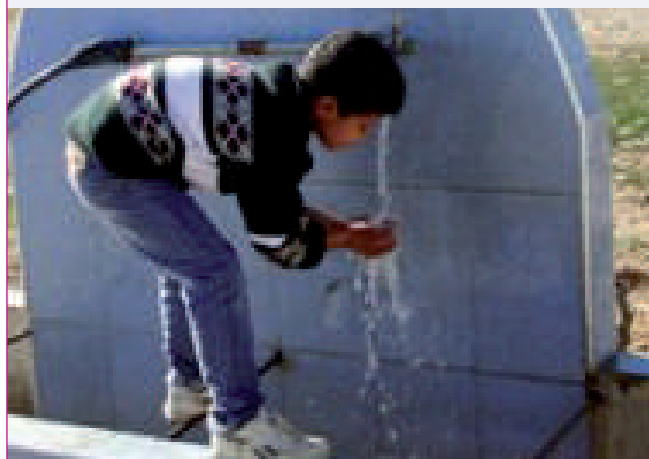
### RESULTS

- No abstraction of natural fresh water;
- Reduction in energy consumption as a result of ending pumping from the river;
- Reduction in the risk of local flooding (since the lake's creation the village of Waterhouse has not experienced the floods it did in previous years);
- Reduction in the risk of pollution since the lake may be totally isolated from the river in the unlikely event of an accident;
- Promotion of the region with the creation of a natural habitat which forms a protective barrier for the fragile ecosystem of the River Hamps. Creation of footpaths and a bird-watching site.

This performance has been recognized by the Environment Agency which gave the Lafarge cement plant two awards: the Chief Executive's Award and also the Gold Award in the Water Save category.

### PEOPLE CONCERNED

• Environmental protection organizations • Local residents who no longer face the risk of flooding from the River Hamps • The English Environment Agency which has recognized the initiative with two major awards • The Lafarge plant's employees, who are proud to contribute to protecting their ecosystem.



## Algeria

## PROVIDING WATER TO THE NEIGHBORING COMMUNITY

### OBJECTIVES

• Provide local communities free and direct access to freshwater • Manage and strengthen the close ties with the neighboring community of the M'Sila plant.

### SUMMARY

One hundred and fifty people from the village of Zeghad, located 48 miles east of Algiers, had no access to running water within their houses or within the village. They had to buy water at the price of 1000 DZ (10 euros) for a 3,000 liter tank, making it an expensive commodity that most villagers could not afford.

Villagers, including women, children and the elderly, were therefore left with no option but to cross considerable distances on foot to reach water points, whatever the weather conditions.

The Lafarge Cement plant in M'Sila decided to take measures:

- Water pipes were specially set up to bring water solely from the Lafarge Water Reservoirs straight into the village center. There, water flows from a fountain and gathers below the fountain in a stone basin for cattle and sheep to drink.
- Special places with running water were made available close to homes for general domestic activities (cleaning, laundry).

### RESULTS

- Villagers and their families now enjoy free access to water supply outlets installed close to their houses, for both their domestic use and for farming.
- The good standard quality of the water supplied by Lafarge has been certified by the Hygiene Inspection Service of the local authorities, from the Wilaya of Bordj-Bou Arreridj.
- Many villagers have planted new gardens, including herb gardens, and various shrubs around their houses.

### PEOPLE CONCERNED

• Lafarge teams from M'Sila cement plant • Villagers from Zeghad • Local authorities from the Wilaya of Bordj-Bou Arreridj.

## Jordan

# RAINWATER HARVESTING TO SAVE GROUND WATER



In order to secure independent water supply in an arid region, the Lafarge cement plant in Fuhais installed pumps and pools dedicated to the collection of rainwater.

### OBJECTIVES

- Provide the plant with the adequate quantity of water for cooling purposes
- Reduce the cost of cooling operation
- Avoid using fresh water, which is needed for local communities, for industrial purposes.

### SUMMARY

The Lafarge Fuhais cement plant, in Jordan, is located in a water scarcity region due to the dry climate (200-300mm/y). Preserving the primary source of water in Jordan, which is rainfall, is therefore an essential issue.

The plant thus decided in 2010 to change its water management system:

- During the first phase, a pumping system was installed to fill the industrial tanks with rainwater for cooling purposes. A new pool nearby, with a capacity of 9,000 m<sup>3</sup>, was also created to be used for industrial water.
- In a second phase, the capacity of the three pools is to be increased to 122,000m<sup>3</sup> (instead of 36,000m<sup>3</sup>) by enlarging the collecting area. In addition, the ground level area is to be covered with concrete to avoid water leakage.

### RESULTS

- 50,000m<sup>3</sup> of fresh water which were used as industrial water, were saved in the year.
- The Fuhais plant secured independent water supply during the four seasons.
- The cost of cooling water was cut down to zero, allowing savings over €30,000 per year.

### PROSPECTS

Enlarging the capacity of 3 pools and line the new one with concrete.

### TOTAL COST

Over €30,000.

### PEOPLE CONCERNED

- Plant manager
- Project manager
- Environment manager.



## Spain

# A RECYCLING CIRCUIT TO OPTIMIZE WATER CONSUMPTION

The Lafarge Cement plant of Villaluenga, located in a dry area of Spain, designed and implemented a closed-loop water recycling system to make the best use of the industrial and domestic water available.

### OBJECTIVES

- Reduce consumption of process water
- Cut down the water discharge to the public network.

### SUMMARY

The Lafarge Villaluenga cement plant is located in the middle of the Iberian Peninsula, in a continental climate, which sometimes experiences long periods without rain, leading to water shortages. For these reasons, the conservation and best use of water resources are essential.

The plant designed a closed recycling industrial water circuit in order to enable the recirculation of all water. This entails the use of:

- Storage ponds to return water into the circuit,
- Refrigeration towers for water cooling.

All the water used in the plant for industrial purposes is consumed for evaporation (conditioning towers) or to fill the water circuit to cool the equipment. The only water discharged to the public network is the domestic water and rainfall water.

Last but not least, the Lafarge plant is connected to the municipal treatment plant. This treated water from the community is used as industrial water, which avoids the resort to fresh water.

### RESULTS

- Significant reduction of water consumption (70,000 m<sup>3</sup> per year of drinkable water).
- Use recycling water instead of natural resources (surface, groundwater).

### PEOPLE CONCERNED

- Villaluenga plant teams
- Local stakeholders

## United States

STORMWATER  
MANAGEMENT

On February 10, 2012, a Federal Court approved a settlement between the US Environmental Protection Agency (EPA) and Lafarge North America concerning alleged violations of the US Clean Water Act as it pertains to stormwater runoff. The agreement resolves allegations by the United States, EPA and several states (Maryland and Colorado) that Lafarge had stormwater violations at twenty one sites located in New York, Maryland, Georgia, Alabama, and Colorado.

<http://www.epa.gov/compliance/resources/cases/civil/cwa/lafargenorthamerica.html>

## Concerns about the situation

This case began in 2006 when EPA inspected a number of aggregate, ready-mix, and asphalt manufacturing plants. Based on those inspections, EPA alleged that Lafarge failed to meet stormwater permit requirements, such as the failure to maintain best management practices (BMPs), perform the proper inspections and sampling, and maintain certain plans and records. While generally the proper controls were in place to prevent impacts to the environment, many of the sites inspected by EPA did not have the appropriate documentation, training, and/or organization in place to demonstrate compliance with the regulations related to stormwater. Therefore, Lafarge sought to address this issue in a proactive and cooperative manner with the agencies involved.

## What are Lafarge's actions?

This settlement – which is the second of its kind for our sector (the Aggregate and Concrete Division of Holcim settled a similar case with EPA in August 2009) – supports the fact that we continue to identify opportunities to improve our environmental performance in ways that meet or exceed regulatory requirements and guidelines. Under the terms of the settlement, Lafarge will pay a civil penalty of \$740,000, make a \$10,000 payment to an environmental group (Western States Project), and implement two environmentally beneficial projects. In addition, we will continue our development and implementation of a number of proactive programs, such as an environmental management system and auditing program, to ensure future compliance with stormwater requirements at all of our plants.

The two environmental projects involve preserving undeveloped property in Maryland and Colorado. The Maryland property is located just outside of the Monocacy National Battlefield and is one of the largest (approximately 140 acres) undeveloped tracts in a highly urbanized area outside of the city of Frederick. As part of that project, Lafarge will also pay \$10,000 to the Maryland Environmental Trust to help cover the Trust's costs of overseeing the conservation easement. The Colorado property (approximately 26 acres) will also provide an important buffer to development, protecting a local municipal water source north of Metro Denver.

We believe that this settlement and the actions we will undertake as part of the agreement demonstrates that we want our plants to continue their work to minimize environmental impacts as much as possible. We will also continue to work closely with local, state and federal governments to implement the enhancements described in the agreement.

## Web+

## WATER PROTECTION

**United Kingdom** - A cement plant self-sufficient in process water  
**United Kingdom** - Measuring a plasterboard plant's water footprint  
**Romania** - Responsible water management  
**Brazil** - Reducing water consumption  
**Turkey** - Making waves in water recycling  
**Thailand** - Preventing contamination of soil and surface run off  
**China** - Wastewater recycling  
**France** - Closed-loop recycling of cooling water  
**United States** - A Mississippi river cleanup



# Reporting methodology

We have aligned our definitions for reporting across all product lines of the Group and have updated our air emissions methodologies to conform to new guidelines issued by the WBCSD CSI.

## Reporting standards

The rules for computing the KPIs are consistent with the GRI (Global Reporting Initiative) G3 reporting standard. Where detailed definitions of KPIs are defined by WBCSD - CSI (World Business Council for Sustainable Development - Cement Sustainability Initiative), the recommended CSI methodology is used for the calculation of the KPI. All elements for calculating KPIs are documented in a glossary specific to the Cement, Gypsum or Aggregates and Concrete businesses. Compliance with GRI G3 and a summary of reporting standards used is documented online at <http://www.lafarge.com>.

Health and safety data is collected separately, taking into account our internal guidelines and external best practice. The Group's Social Policies department conducts a separate survey on social data.

The KPI related to the training on stakeholder relationships is also tracked and verified. Local stakeholder relationship management training is organized around plant managers (in Cement and Gypsum) and area/regional managers in Aggregates and Concrete. Our 2008, 2009 and 2010 reports received a GRI A+ application level check.

## Scope of consolidation and reporting methodologies

The reporting covers all business units and their industrial production sites under the Group's management control throughout the world.

When a new site is acquired by Lafarge, procedures and definitions for sustainability data are not necessarily in line with Lafarge standards. Accordingly we give the new site a maximum of four years to meet our standards. This period is necessary to implement the appropriate management and data collection systems, in order to yield good, reliable data for reporting.

When a plant is sold, we cease to include its performance data and we remove its data from the baseline data used for our Sustainability Ambitions, whether the reference year is 1990 or 2005. For plants divested during the year, environmental and social data is excluded for the entire year; for health and safety, data is included up until the time of divestiture.

We use the CSI Protocol V3 to calculate CO<sub>2</sub> emissions between the 1990 baseline and the reporting year.

In 2011 we are changing our methodology for calculating air emissions to be in accordance with the 2012 CSI protocol for reporting. Previously, gas factors based on the type of kiln process were utilized whereas we now use gas factors based on the energy consumption of the specific kiln; 2010 data

and our baseline (2005) is restated using the changed methodology for comparison.

For dust, SO<sub>2</sub> and NO<sub>x</sub> emissions, when measurements are missing, we use standard emission concentrations based on the site's kiln process. In 2011 the standard emission concentration was applied to 0.9% of clinker production for dust emissions, 1.9% for SO<sub>2</sub> emissions and 4.4% for NO<sub>x</sub> emissions. For persistent pollutants, for 2011 reporting we have changed our reporting methodology to be in line with the 2012 CSI recommendation to use the last annual year concentration measurements available rather than a three year average used in past reports; past data is restated using this present definition and the current perimeter for consolidation.

For water, dewatering of quarries and non-contact cooling water taken from surface water and returned to the same catchment is not included in net withdrawal.

For the calculation of safety KPIs that include contractors, contractor off-site hours are not included in the divisor and therefore these indicators may slightly overstate the frequency rates.

Social data and health and safety data is collected by business units and consolidated at Group level. Social data for 2011 in this report is derived from a social survey covering 103 business units in 64 countries representing 100% of the total Group workforce.

## Control and assurance

Environmental data is collected by business line and consolidated at Group level. For cement, environmental experts in the regional technical centers (Beijing, Cairo, Montreal and Vienna) review and validate the performance data for the plants within their regions.

Ernst & Young provides independent verification for sustainability data. A selection of key quantitative indicators (lost time injury frequency rate and fatality rate; total headcount, workforce by type of contracts and by Status, workforce hirings, resignations, retirements, redundancies and death; women in senior and executive management; sites environmentally audited, quarries with rehabilitation plans and quarries screened for biodiversity; CO<sub>2</sub>, dust, NO<sub>x</sub>, SO<sub>2</sub>, Mercury, VOC and Dioxins/Furans emissions, water withdrawals by sources, and total, quarried and alternative raw materials consumption) were reviewed to issue a limited assurance report. More details may be found on the verification works and conclusion in Ernst & Young's independent assurance report provided in our Registration Document, section 7.9.

# CSI and Common Reporting

## Chart of key performance indicators

CSI key performance indicators - Data and coverage					
Issue	GRI	Key Performance Indicator (KPI)	KPI		LEVEL
			2011	2010	
Climate Protection	EN16	Total CO <sub>2</sub> emissions - gross (million tons)	97.9	93.3	CEMENT
	EN16	Total CO <sub>2</sub> emissions - net (million tons)	95.0	90.8	CEMENT
	EN16	Specific CO <sub>2</sub> emissions - gross (kg/ton cementitious material)	610.7	621.0	CEMENT
	EN16	Specific CO <sub>2</sub> emissions - net (kg/ton cementitious material)	592.9	604.5	CEMENT
		Independent third party assurance of CO <sub>2</sub> data (Frequency)	Yearly	Yearly	GROUP
Fuels and Raw Materials		Specific heat consumption of clinker production (MJ/ton clinker)	3,657	3,667	CEMENT
	EN4	Alternative Fuel Rate (%)	13.0%	11.6%	CEMENT
	EN4	Biomass Fuel Rate (%)	4.71%	4.04%	CEMENT
	EN2	Alternative Raw Materials Rate (%)	11.20%	10.99%	CEMENT
	EN2	Alternative Raw Materials Rate (%)	3.3%	3.7%	A&C
		Clinker/Cement Ratio (%)	0.7306	0.7402	CEMENT
Materials used by weight and volume	EN1	Consumption of material (million tons)	415.9	413.2	GROUP
	EN1	Quantity of quarried material (million tons)	377.2	362.4	GROUP
Consumption of Energy	EN3	Direct Energy consumption by primary energy source (PJ)	468,922	435,427	GROUP
	EN4	Indirect Energy consumption (PJ)	57,975	53,821	GROUP
Employee Health and Safety	LA7	Number of fatalities (employees)	8	9	GROUP
	LA7	Number of fatalities per 10,000 employees	1.11	1.18	GROUP
	LA7	Number of fatalities (sub-contractors)	17	24	GROUP
	LA7	Number of fatalities (3 <sup>rd</sup> party)	9	11	GROUP
	LA7	Number of Lost Time Injuries (employees)	93	120	GROUP
	LA7	Lost Time Injuries per 1 million manhours (employees)	0.63	0.76	GROUP
	LA7	Number of Lost Time Injuries (sub-contractors)	63	111	GROUP
	LA7	Lost Time Injuries per 1 million manhours (sub-contractors)	0.58	0.94	GROUP
	LA7	Total Number of Lost Time Injuries	156	231	GROUP
	LA7	Independent third party assurance of safety data (LTIFR and fatalities)	Yearly	Yearly	GROUP



## CSI key performance indicators - Data and coverage

Issue	GRI	Key Performance Indicator (KPI)	KPI		LEVEL
			2011	2010	
Emissions Reduction	EN20	Total NO <sub>x</sub> emissions (tons/year) <sup>(1)</sup>	190,288	200,275	CEMENT
	EN20	Specific NO <sub>x</sub> emissions (g/ton clinker)	1,625	1,800	CEMENT
	EN20	Total SO <sub>2</sub> emissions (tons/year) <sup>(1)</sup>	50,613	47,364	CEMENT
	EN20	Specific SO <sub>2</sub> emissions (g/ton clinker)	432	426	CEMENT
	EN20	Total Dust emissions (tons/year)	16,862	17,434	CEMENT
	EN20	Specific Dust emissions (g/ton clinker) <sup>(1)</sup>	144	157	CEMENT
	EN20	Mercury emissions - t/year	4.0	3.7	CEMENT
	EN20	Mercury emissions mg/t clinker	34.2	33.3	CEMENT
	EN20	Dioxin/Furans emissions - g TEQ/year	4.7	7.0	CEMENT
	EN20	Dioxin/Furans emissions pg/ton of clinker	40.0	62.9	CEMENT
	EN20	VOC emissions - kt/year	4.6	4.2	CEMENT
	EN20	VOC emissions g/t clinker	39.0	37.7	CEMENT
		% Clinker produced with monitoring of dust, SO <sub>2</sub> and NO <sub>x</sub> emissions	94%	90%	CEMENT
		% Clinker produced with continuous monitoring of dust, SO <sub>2</sub> and NO <sub>x</sub> emissions	65.9%	62.0%	CEMENT
		Independent third party assurance of emissions data (Frequency)	Yearly	Yearly	GROUP
Local Impacts	MM1	% of sites with quarry rehabilitation plans in place	86.4%	84.5%	GROUP
	S01	% of sites with community engagement plans in place	69%	64%	CEMENT
Biodiversity KPI no. 1	EN11	Number of quarries within, containing, or adjacent to areas designated for their high biodiversity value, as defined by GRI EN11 (number and coverage)	132 18.3%		GROUP
Biodiversity KPI no. 2	MM2	Percentage of quarries with high biodiversity value where biodiversity management plans are actively implemented	49.2%		GROUP
Strategies; current actions and future plans for managing impacts on biodiversity	EN14	Percentage of active quarries that have been screened for biodiversity according to WWF's criteria	97.2%	90.7%	GROUP
Environmental Expenditures and total investments by type	EN30	Environment capital expenditure (million euros)	79.2	81.8	GROUP
	EN30	Environment operating expense (million euros) <sup>(2)</sup>	179.5		GROUP
Total weight of waste by type and disposal method	EN22	Dust disposed on-site (kton)	559	687	CEMENT
	EN22	Non hazardous waste recovered (kton) <sup>(3)</sup>	205.7		GROUP
	EN22	Non hazardous waste disposed (kton) <sup>(3)</sup>	307.1		GROUP
	EN22	Hazardous waste recovered (kton) <sup>(3)</sup>	17.0	18.6	GROUP
	EN22	Hazardous waste disposed (kton) <sup>(3)</sup>	2.1	35.1	GROUP
Total water withdrawal by source	EN8	Total water withdrawal from ground water (Mm <sup>3</sup> )	42.3	96.1	GROUP
	EN8	Total water withdrawal from open water (Mm <sup>3</sup> )	211.6	182.2	GROUP
	EN8	Total water withdrawal from other sources (Mm <sup>3</sup> )	13.0	14.5	GROUP
	EN8	Rainwater Harvested (Mm <sup>3</sup> )	15.7	33.4	GROUP
		Net water withdrawal (Mm <sup>3</sup> )	120.9	174.0	GROUP
		Quantity of water consumed (Mm <sup>3</sup> )	81.3	96.3	GROUP

## CSI key performance indicators - Data and coverage

Issue	GRI	Key Performance Indicator (KPI)	KPI		LEVEL
			2011	2010	
Percentage and total volume of water recycled and reused	EN10	% of sites equipped with a water recycling system	68%	73%	GROUP
Actions taken in response to incidents of corruption	SO4	% of sites that have implemented the Competition Compliance Program	96%	96%	GROUP
Total workforce by employment type, employment contract, and region, broken down by gender	LA1	Total headcount	67.924	75.677	GROUP
	LA1	Percentage of full-time employees	99.0%	99.1%	GROUP
	LA1	Percentage of part-time employees	1.0%	0.9%	GROUP
	LA1	Percentage of permanent employees	97.0%	96%	GROUP
	LA1	Percentage of fixed-term contract employees	3.0%	4.0%	GROUP
Total number and rate of new employees hires and employee turnover by age group, gender, and region	LA2	Number of hirings	7,400	5,991	GROUP
		Number of resignations	3,770	3,752	GROUP
		Number of retirements	776	1,057	GROUP
		Number of redundancies	4,308	3,986	GROUP
		Number of deaths	125	142	GROUP
Percentage of employees covered by collective bargaining agreements	LA4	Percentage of business units where employees are covered by collective agreements	74%	71%	GROUP
	LA4	Percentage of employees covered by collective agreements	81%		GROUP
Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs	LA6	Percentage of total workforce represented in Health & Safety Committees	98%	97%	GROUP
Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by regions and by gender	LA7	Injury Rate (TIFR - Employees)	2.8	3.1	GROUP
		Total number of male / female fatalities	33M/1F		GROUP
Average hours of training per year per employee, by gender, and by employee category	LA10	Average number of hours of training for management staff	41	45	GROUP
	LA10	Average of number of hours of training for non-management staff	29	31	GROUP
Percentage of employees receiving regular performance and career development reviews, by gender	LA12	Percentage of management staff having an annual performance review	91.0%	94.0%	GROUP
		Average hours of training per year per employee, by gender, and by employee category	62.0%	64.0%	GROUP
Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity	LA13	Percentage of employees under the age of 30	16.1%	16.7%	GROUP
	LA13	Percentage of employees between 30 and 50	63.0%	63.3%	GROUP
	LA13	Percentage of employees above 50	20.9%	20.0%	GROUP

(1) Data for the year 2010 has been recalculated according to the new method.

(2) Operating expense was reported for 52% of operations. Further to reliability checks by the Group, the figure here is extrapolated to 100% from a sample of operations (≈ 40%).

(3) For A&C, data was reported for 47% of operations and extrapolated to 100%.

# Measuring up

Sustainability ratings and indices are an indication of how our performance compares with other companies; they highlight where we need to improve and help us to identify emerging issues. We are recognized for inclusion in the Dow Jones Sustainability Index and several other similar indices.

## SRI ratings and indices

Socially responsible investment (SRI) ratings and indices are produced by organizations that supply information to the investment market. They are produced by sustainability teams within established financial rating agencies, sustainability consulting firms, investment advisors, asset managers, suppliers of investment products, non-governmental organizations and others. Most operate by collecting information on companies' sustainability activities and then rating these activities according to criteria that they define. In many cases the collection of information includes detailed questions on the company (the "SRI questionnaire") and conducting their own research. Inclusion in an index is a function of a company's performance (its score) and how this compares with other companies in its sector of activity (its rank position). In a climate in which other companies' sustainability performance is improving, remaining in an index can be very challenging. Lafarge is frequently approached by agencies producing SRI ratings and indices. Provided the methodology is transparent and the information requests are reasonable, we respond to their questionnaires and welcome the opportunity for dialogue. We want investors to have access to information about our sustainability approach, and engagement with SRI agencies is an opportunity for us to consider where and how we must improve.

## Dow Jones Sustainability Indices

Our overall score in 2011 was 76%. This is similar to our 2009 performance after reaching 78% in 2010. Although the appreciation of our improved economic performance placed Lafarge among the top companies of the DJSI World index, our rating in other areas dropped, with the largest decline in the environmental dimension (from 81% in 2010 to 74% in 2011). That being said, Lafarge remains above sector average. Most noticeable improvements include customer relationship management and corporate citizenship and philanthropy, which we flagged last year as an area needing improvement in 2011. However, we need to continue to pursue our efforts in both those categories in 2012, as Lafarge's performance remains far from best-in-class. Lafarge's disclosure and overall management of its environmental footprint is still highly rated, but our grades relative to operational eco-efficiency and water-related risks clearly convey room for improvement in 2012. With this score, we remain in the DJSI Europe Index as well as in the DJSI World Index.



**Lafarge ranked number 1 in the materials sector in the Carbon Disclosure Project.**



## FTSE4Good Index Series

Lafarge remains in all the applicable FTSE4Good Index series, with a clear sign of sector leadership, especially in the social and governance dimensions.

## Ethibel Sustainability Index

In 2011, Lafarge has been reconfirmed for inclusion in both the Ethibel PIONEER and Ethibel EXCELLENCE Investment Register. Lafarge has been selected for inclusion in those indexes every year since 2004.

## Carbon Disclosure Project (CDP)

In 2011, Lafarge ranked 10<sup>th</sup> across industries worldwide and is a member of the Carbon Disclosure Leadership Index for the 6<sup>th</sup> year running: we achieved a score of 96/100 in 2011, number one in the Materials sector (2<sup>nd</sup> in 2010), and the number one French company across all sectors. As well, in 2011, Lafarge ranked A- in the Carbon Performance Index due to the fact that our scope 2 emissions (CO<sub>2</sub> indirect emissions related to electricity consumption – less than 10% of our total emissions) are not yet third party verified. We are considering such scope 2 verification for the coming years.

## Other indices

There has been no change in the evaluation of Lafarge by Sarasin since January 2011. Overall, Lafarge is rated "above average" and qualifies for inclusion in Sarasin Sustainability Funds. Vigeo updated its evaluation of Lafarge in April 2011 and rated the company's CSR performance above sector average. However, again in 2011 Lafarge was not included in the listing of the Global 100 Most Sustainable Corporations in the World, despite the presence of 5 French companies. This challenges us to maintain our leadership on sustainability practices. Finally, Oekom renewed its evaluation of Lafarge and confirmed its C+ Prime rating, indicating that the company "ranks among the world's best companies within the same industry and fulfils the sector specific minimum requirements".

## Methodology

### Local performances

The Group applies in practice on a daily basis its sustainable development values. This commitment was recognized in 2011 by various independent organizations and professional associations. Committing to employee health and safety, constructing sustainably, preserving the environment, supporting local stakeholders, etc. All these values are promoted daily by the actions and work of employees who place sustainable development at the heart of the Group's strategy. In 2011, the Group's sites were granted over 100 external awards in sustainable development. The Group also made a difference with:

- its ranking in the Carbon Disclosure Project - it is ranked 10<sup>th</sup> worldwide and 1<sup>st</sup> in the "Materials" category;
- the transparency of its financial communications to shareholders, for which it received Boursoscan's award.

### All prizes awarded in 2011

### Biodiversity Awards

The following countries received awards for their efforts in preserving ecosystems, and particularly in rehabilitating quarries:

- Canada,
- France,
- United-Kingdom.

In addition to these awards, North America received 43 Wildlife Habitat Council certifications.

### Protection biodiversity

### Biodiversity case studies

### Communities Awards

The following countries received awards for their support and help programs to local communities:

- Canada,
- Indonesia, for its access to drinking water program,
- Nigeria,
- the United Kingdom, for their initiatives in education in particular,
- the United States, for their initiatives in education in particular,
- Ukraine.

### Supporting local communities

### Communities case studies

### Health & Safety Awards

The following countries received awards for their exemplary practices in Health & Safety (procedures, initiatives etc.) and their excellent performance:

- France,
- Greece,
- India,
- Jordan,
- the United Kingdom, for its road safety program in particular.

And for their training/awareness program:

- the United Kingdom,
- the United States.

### Health & Safety

### Health & Safety case studies



### Environmental Performance Awards

The following countries received awards for their outstanding results in preserving the environment:

- Canada, particularly for the management of its dust and pollutants emissions,
- France,
- Malaysia, particularly for the reduction of its carbon footprint,
- Romania,
- Russia,
- the United Kingdom, particularly for the management of its CO<sub>2</sub> emissions,
- the United States for their comprehensive environmental management system - managing emissions, water, waste, preserving biodiversity etc.

In addition to these awards, France received the ISO 9001 certification for 80 quarries and the ISO 14001 certification for 8 sites. Industrial ecology and climate change

### Industrial Performance and Innovation Awards

The following countries received awards for their performance and the quality of their products:

- Canada,
- the United States.

France was also rewarded for its product innovation in individual homes building.

### Working Life Awards

The following countries were recognized as "Best places to work":

- Brazil,
- Spain.

The following country received an award for respecting freedom of association and promoting the right of collective bargaining and social dialogue by Vigeo, the European leader in extra-financial rating:

- Morocco.

### Developing people

TO KNOW MORE  
VISIT ↓

[sustainabilityreport.lafarge.com](http://sustainabilityreport.lafarge.com)

ON THE PAGE DEVOTED TO “OUR 2011 REPORT” ON THE GROUP’S WEBSITE, YOU WILL FIND:

- The 2011 Report (PDF version) along with previous editions.
- Details on our reporting methodology.
- Additional information to help you better understand our values and priorities.
- Other case studies providing practical illustrations of the Group’s actions.

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