HOLCIM SUSTAINABILITY VALUE –

A CORPORATE ASSESSMENT OF THE

SUSTAINABILITY VALUE APPROACH

Master Thesis

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Far from being a burden, sustainable development is an exceptional opportunity - economically, to build markets and create jobs; socially, to bring people in from the margins; and politically, to give every man and woman a voice, and a choice, in deciding their own future.

UN Secretary-General Kofi Annan

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SUMMARY

This paper reports the result of a study made in the context of a master thesis on Holcim contributions to sustainability. The results are based on a model that uses the *Sustainability Value (SV) approach*. The thesis achieves two goals. First it focuses on the method and assesses its potential for use in the corporate world. Companies, rating institutions, governments, or international and non-governmental organizations could eventually all benefit from the method. Second, based on this method, it is an assessment of Holcim added value on its *triple bottom line* capital.

The model delivers different outputs. Using available data, and according to the model, the construction & materials sector is doing worse than the four other sectors studied: chemicals, industrial metals, mining, and oil & gas. Furthermore, an analysis of the cement sector shows that although Holcim is leading the sector, yet for the year 2006, because of different factors, the results are not reliable enough to draw any conclusions. Overall, the results remain general. Insufficient sustainability reporting, difficulty of performing cross-sector comparison, or the number of exogenous factors influencing the results are all reasons that tend to invalidate the model. However, despite the generality of the outputs and considerable room left for improvement, the study is an interesting practical application and suggests different potential for use in the future.

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LIST OF ABBREVIATIONS

ADVANCE:	**A**pplication and and **D**issemination of **Va**lue-Based Eco-Rati**n**gs in Financial Markets
CEC	Commission of the European Communities
CEFIC	European Chemical Industry Council
CO_2	Carbon dioxide
CSR	Corporate Social Responsibility
EC	European Commission
EU	European Union
EUROFER	European Confederation of Iron and Steel Industries
FAS	Financial Accounting Standard
GhG	Greenhouse gas
GRI	Global Reporting Initiative
IAS	International Accounting Standard
IASB	International Accounting Standard Board
LTI	Lost-time injuries
N_2O	Nitrous dioxide
NeW	Nachhaltig erfolgreich Wirtschaften
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxide
ROI	Return on Investment
RC	Return to cost
SAM Group	Sustainable Asset Management Group
SO_x	Sulfur oxide
SO_2	Sulfur dioxide
SV	Sustainability value
UNCTAD	United Nations Conference on Trade and Development

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UNEP	United Nations Environment Programme
VOC	Volatile organic compound
WBCSD	World Business Council for Sustainable Development

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1 INTRODUCTION

1.1 Motivation

Sustainable development is development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland 1987). The concept of sustainable development has come a long way since the beginning of the 90s, and is now accepted worldwide. Today most corporations agree that they have to integrate the concept into their daily activities, regardless of whether they see it as a business opportunity or a burden. Holcim is convinced that there is no other way than "embedding sustainable development [in the company] vision, strategy and management systems" (Ackermann & Soiron, 2005). Nominated as a leader of industry for the last three years by the Dow Jones Sustainability Index (DJSI), the company is widely recognized for its commitment and contribution to sustainability.

Measuring corporate sustainability has been a challenge ever since the concept first emerged at the beginning of the 90's. Atkinson (2000), Figge & Hahn (2004), and many others before have all proposed methods and metrics for assessing a firm's sustainability performance. There was at least one point of convergence common to all these different studies: sustainability cannot be measured as easily as financial performance and it is much more complex. Sustainability is based on a *triple bottom line* perspective that considers economic, social and environmental developments which are "interrelated, interdependent, and partly in conflict" (Elkington, 1997, as cited in Jeurissen, 2000, p. 229). Corporate sustainability is not only about ensuring financial growth in the future in order to satisfy the shareholders. It implies an efficient and effective use of economic, social and environmental capital in the present, which ensures the growth of the company and the improvement of society and the environment in the future. Corporate sustainability aims at "meeting the needs of a firm's direct and indirect stakeholders, without compromising its ability to meet the needs of future stakeholders as well" (Dillyck & Hockerts, 2002, p. 131). Because of the complexity of the issue and the lack of experience and knowledge on how to address it, corporate sustainability remains a concept that is difficult to deal with. As a result, there are few tools available today to asses corporate sustainability and determine the strength and weaknesses of a firm according to the integrated view of the *triple bottom line*.

My interest in this subject is two-fold. First, as explained above, the issue of corporate sustainability is still at an embryonic stage, even though it is of critical importance to

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today's society. Second, my work experience at Holcim offered me a good insight into the challenges faced by the cement industry in terms of sustainability. As a result, I seized the opportunity of the master thesis to undertake academic research for Holcim and thereby contribute to the further development of tools to assess corporate sustainability.

1.2 Objectives and structure of the thesis

The paper was supported jointly by the Corporate Strategy and Risk Management department of Holcim Group Support and the University of St. Gallen in the context of a master thesis. It presents a model based on the *Sustainable Value (SV) approach* (Figge & Hahn, 2004) that assesses Holcim's sustainability performance.

The paper responds to the following objectives:

1. *To assess Holcim, using the SV approach, in order to better understand its challenges in terms of sustainable development, and to identify its strengths and weaknesses in this field compared with, among others, the construction & materials sector.*
2. *To assess the SV approach itself and the consistency and reliability of its results, in order to determine possible applications for the method.*

The paper is organized as follow: Chapter 2 gives an overview of the approach and explains how the calculations were made. Chapter 3 defines the scope of the study, describing all the variables and parameters, and justifying the different assumptions. Chapter 4 presents the results, suggests possible interpretations, and discusses whether or not the model is realistic. Finally, chapter 5 critically examines the whole study and the *SV approach* and looks for possible applications of the method.

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2 THE SUSTAINABILITY VALUE APPROACH

2.1 Background on measuring sustainability

The *Sustainability Value (SV) approach* is a method developed by the Sustainable Development Research Center and the Institute for Future Studies and Technology Assessment in Berlin, and the University of St. Andrews in Scotland to assess corporate contribution to sustainability. A firm contributes to sustainability when the benefits provided to the stakeholders are greater than the economic, environmental and social costs (Figge & Hahn, 2004, p. 175). Although this postulate may appear obvious at first, it remains very difficult to apply in a real life situation because it is almost impossible to evaluate all the social and environmental costs faced by a firm.

The rise of the corporate sustainability concept provoked the need to find ways of measuring improvements made by firms. Along with sustainability, many have seen the duality between economic growth and environmental, respectively social, improvements as a win-win solution (Young & Tilley, 2006, p. 403). Eco-, and socio-efficiency are relative measures of the firm's added value to society per environmental, or social impact (Dyllick & Hockerts, 2002). Companies have generally accepted the principles and have since been working on improving their efficiency in the sense defined above. If improved efficiency is a necessary condition for corporate sustainability, it is not sufficient. Companies gain in efficiency when, at constant prices and costs, they use less resources per output produced. Nevertheless, if their activities damage the environment or lower the societal capital of communities, economic growth may cancel the improvements made in terms of capital used per unit produced, thus cancelling the positive contributions. There is a so-called rebound effect (Berkhout, Muskens & Velthuijsen, 2000). Because of its economic growth, the firm sells more output and the sales' increase writes off the diminution of social and environmental negative impacts. In absolute terms, social and environmental impacts may grow, even if efficiency improved. In order to avoid this kind of phenomenon, companies need to work not only on improving efficiency, but also effectiveness. Effectiveness focuses on the absolute use of input. Environmental and social capitals, unlike most of the economic capital, are non-substitutable: one cannot be replaced by the other; they are irreversible: intensive use of the capital may lead to irreparable damage; and they are non-linear: when used more intensively, productivity rises until a threshold is crossed, after which it falls abruptly (Dillyck & Hockerts, 2002). For these reasons, companies have to lower their environmental and social impacts to a

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sustainable threshold. The license to operate should be given to companies with business solutions that are “life sustaining, restorative, and regenerative in addition to being efficient”, and that improve “the quality of life of the workforce and their families as well as of the local community and society at large” (Young & Tilley 2006, p. 404) while behaving ethically and contributing to economic development.

Figge & Hahn (2004, p.178) tried to integrate this duality between efficiency and effectiveness in the *SV approach*. Whether they succeeded or not remain open and will be broadly discussed along this paper.

2.2 Description of the method

The description of the *SV approach* is based on the results of two studies carried out by Figge & Hahn: the *ADVANCE Project* (2006a), which was an assessment of 65 European companies and the *Nachhaltig erfolgreich Wirtschaften (NeW)* (2007), an assessment of 27 German companies. Both studies used the *SV approach*.

The starting point of the method lies in the foundations of modern economics and more specifically in the economics of opportunity cost. According to this, resources create value only when there is no alternative use that generates more value with the same resources. Opportunity cost theory compares the return of allocating a resource in a specific project with the returns of alternative allocations. The cost of the resource is the benefit that could have been earned if the resource were allocated in another project. In a similar way, Figge & Hahn have applied this theory to environmental and social capital. Company A generates a certain return using a certain amount of environmental or social capital. If company B generates higher return with the same resources, then company B is a better investment for society (the “owner” of environmental and social capital). The opportunity cost is then the return that society could achieve in alternative investments using the same amount of capital. The use of opportunity cost to evaluate social and environmental capital is totally new and is the main contribution of the *SV approach.* Afterwards, traditional methods are used to evaluate the firm’s contribution to sustainability: i.e. the difference between the revenues of the firm and the opportunity cost of economic, environmental and social capital. Hence, the cost evaluation is no longer based on the extent of the damage caused by the use of the resources, but on the returns that would be generated by an alternative use of those resources.

These are the fundamentals of the method; now let us look at the critical points to consider when using the *SV approach*. The quality of the model depends on three key

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choices: the benchmark, the resources to be included, and the return figure. The benchmark will determine the cost of opportunity. In the ADVANCE study it was the EU-15 economy, in the NeW study the German economy. The benchmark can be a national or regional economy, a sector average or any group of companies, depending on what the user wants to express. Benchmark efficiency represents the average performance of the alternatives. It is the opportunity cost of investing the resources in a specific company. If a company delivers value, it is more effective than the benchmark. The resources included in the study will determine the completeness of the calculated value. If the resources describe only ecologic capital, then the value will not reflect any social impact at all. Therefore it is important that economic, ecological and social capitals are taken together into consideration (*triple bottom line*). It is also important to use absolute numbers that describe specific types of capital. Finally, the return figure will determine from which perspective the corporate contribution to sustainability is addressed. Returning the net income to the capital invested reflects the interest of the shareholders; returning the net added value (net income + tax, interest, and personal expenses) to the capital invested: the interest of society. In addition to those three key variables, it is also important to determine over which period the analysis will be carried out and which companies will be assessed.

The next step is the calculation of the SV. This follows a five steps process:

1. “How much resources has the company used?
2. How much return does the company create with its resources?
3. How much return would the benchmark have created with each resource?
4. What is the value contribution of each resource?
5. How much Sustainable Value does the company create?” (Figge & Hahn, 2006a, p. 16)

First, all the necessary data are collected in order to know how much resources the company has used. This information comes from financial and sustainability reports, and thus is available to everybody. Section 3.2.1 describes the difficulty of finding comparable data from one report to the other, which can constitute a considerable weakness. Secondly, the return created by the company with its resources has to be calculated. This would be, for example, the financial value generated by the company, per amount of carbon dioxide (CO_2). Thirdly, the two first steps are repeated for the benchmark in order to obtain the opportunity cost of the capital. The opportunity cost for the company of using one type of capital equals the resource efficiency of the benchmark multiplied by the amount of capital used. Table 1 shows the contribution Holcim would make to society in 2006, according to the model developed hereafter.

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The opportunity cost is how much value the benchmark would generate (or have generated) using the same amount of CO_2. In this case, with 99.8 million tons of CO_2 emitted, the benchmark would deliver a 22.7 billion euros contribution, while Holcim only delivered 5.6 billion euros. Therefore, 22.7 billion euros is the opportunity cost for the society to "invest" 99.8 million tons of CO_2 in Holcim. The fourth step gives the value contribution to the group of stakeholders considered, here the society as a whole, by taking the difference between the added value of the company and the opportunity cost.

	Quantity emitted by Holcim		Efficiency (€ per unit of resource)	Revenue realized with the resources	Value contribution
		Holcim	56.25 €	5'613'664'596 €	
CO2 Emissions	99'800'000 t				-22'654'523'386 €
		Benchmark	283.25 €	28'268'187'982 €	

Table 1: Value contribution of Holcim CO_2 emissions in 2006

Finally, the last step sums up the contribution of each resources and divides it by the number of resources considered, showing the global contribution of the firm to sustainability. The resulting value represents how much more value than the benchmark the company achieved to produce, conversely how much less when the output is negative. Details for the calculation of the value contribution of all indicators and of the SV for Holcim in 2006 are shown in table 2. The last line determines the opportunity cost for Holcim to use its resources. Since the SV equals the added value of the firm minus the opportunity cost, the opportunity cost is the added value plus the SV. (Figge & Hahn, 2006a, p. 19)

	Benchmark efficiency	Resources used by Holcim	Opportunity cost	Value added	Value contribution
Capital employed	36%	22'410'559'006 €	8'060'683'772 €	5'613'664'596 €	-2'447'019'176 €
Pension funding	713%	379'503'106 €	2'705'504'111 €	5'613'664'596 €	2'908'160'485 €
CO2 Emissions	283	99'800'000 t	28'268'187'982 €	5'613'664'596 €	-22'654'523'386 €
NOx Emissions	152224	192'376 t	29'284'235'743 €	5'613'664'596 €	-23'670'571'147 €
SOx Emissions	137611	59'140 t	8'138'333'550 €	5'613'664'596 €	-2'524'668'953 €
Water consumption	42	166'000'000 t	6'928'358'311 €	5'613'664'596 €	-1'314'693'715 €
Group Employess	186580	88'783	16'565'093'209 €	5'613'664'596 €	-10'951'428'613 €
Lost Time Injuries	34759720	701	24'367'626'344 €	5'613'664'596 €	-18'753'961'747 €
Sustainability Value (Average of the Value Contribution)					**-9'926'088'282 €**
Value Added					5'613'664'596 €
Opportunity Cost of using all resourced					**15'539'752'878 €**

Value Added - Opportunity Cost = Sustainability Value
Value Added - Sustainability Cost = Opportunity Cost

Table 2: Calculation of the opportunity cost of using all resources

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Figge & Hahn did not stop with the calculation of the SV. What comes out of the calculations above tells us if a company is contributing more to sustainability than the benchmark[1]. A positive contribution means that the company's benefits to society are higher than the opportunity cost, whatever the size of the company. Nevertheless, it is very likely that a bigger company will use more capital and generate more income. Hence it will tend to have bigger contributions, either positive or negative. Comparing the sustainable value of two companies does not tell us which company is using its resources in the most efficient way. Therefore, Figge & Hahn (2006a, p. 20) propose to observe the Return to Cost (RC) ratio, i.e. the relation between the value delivered by the company and the value that the benchmark would have delivered with the same resources. At the end we can say, for example, that Holcim was 0.36 times more eco-efficient than the benchmark in 2006. This means that the benchmark would have generated almost three times more added value than Holcim using the same resources. Table 3 presents the calculation of the RC ratio of Holcim. This step is easy once all data have been collected, and the calculations shown in table 1 and 2 have been done.

Sustainability Value (Average of the Value Contribution)	**-9'926'088'282**	**€**
Value Added	5'613'664'596	€
Opportunity Cost of using all resourced	**15'539'752'878**	**€**
Return to Cost Ration = Value Added / Opportunity Cost		
Holcim Return to Cost ratio 2006	**0.36**	

Table 3: Calculation of the RC ratio

This chapter does not focus on a deep understanding of the method but rather on the main points that have enabled the calculations used to generate the results presented in chapter 4. Chapter 5 criticizes the results, but also the weaknesses that the approach may contain. Before this, chapter 3 focuses on the choice of different variables and parameters, and collection of the data.

[1] Whether or not the approach really gives the contribution to sustainability of the firm is discussed in chapter 4 and 5. For now, the concept developed by Figge & Hahn is followed and it is considered that the model works.

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3 SCOPE OF THE STUDY

This chapter presents the three key parameters of the model: the benchmark, the resources to be included, and the return figure. As already explained in chapter 2, those parameters determine the quality of the model. Section 3.1 describes the benchmark used. Section 3.2 explains which resources have been included, presents the difficulties encountered in collecting the data, and gives an overview on sustainability reporting. Section 3.3 discusses the return figure used. Finally, section 3.4 compares this study with those already realized by Figge & Hahn.

3.1 Choice of the benchmark

The choice of the benchmark is decisive in the application of the SV method because it significantly influences the results. In addition to that, in this study, the companies chosen for the benchmark were also all assessed by the model. Therefore, the benchmark plays two important roles: first, it forms the basis on which to calculate the opportunity cost of a resource, and second, it provides a point of reference when comparing Holcim's performance with that of other companies.

Holcim is in the construction and materials business. The company has been nominated three years in a row as a leader of industry by the Dow Jones Sustainability Index. An assessment of Holcim's sustainability performance, only vis-à-vis that of the cement industry, seemed rather superficial. Therefore, the benchmark used in this study is composed of multinationals from different regions in the world, and active in different industrial activities. There were two main reasons for choosing an aggregated group of companies as a benchmark rather than the industry average, or a national or regional economy. First, using a group of companies enables the creation of sub-benchmarks to analyze how a specific sector contributes to sustainability. Once the data are collected, it is possible to sort them and group them differently, depending on the type of analysis wanted. Secondly, even if the present study focuses on the performance of Holcim, it is interesting to know how other industrial companies are performing. Section 5.1.1 discusses this choice in more detail.

As a result of the choices above, a benchmark of 24 companies spread over 5 sectors was selected. The sectors should reflect the industries with which the cement industry could be compared when addressing its sustainability performance. Each sector has 4 or 5 companies in order to make possible the assessment of each sector contribution

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to sustainability. The selected sectors are the five first supersectors of the Industry Classification Benchmark (Dow Jones Indexes & FTSE, 2004). They all deal with natural resources and produce industrial materials.

The components of the benchmark are companies from the following sectors:

- Oil & Gas
- Chemicals
- Basic resources and, more specifically, mining
- Construction & Materials
- Industrials goods & services and, more specifically, industrial metals

The sectors comprising consumer goods and services, health care, telecommunications, utilities, financial services, and technology have been left out of the study because they seem to involve different sustainability challenges, or did not provide sufficient information.

The study includes the supersector leaders of the Dow Jones Sustainability Index for the year 2004, 2005 and 2006, some major players of the sectors in terms of revenues (based on the Fortune500 ranking) and other companies considered as being relevant to completing the list. The list of companies is displayed in table 4. Most of the companies were listed in the DJSI in 2006. Only Arcelor, Cemex, Dupont (delisted in 2006), Exxon, HeidelbergCement and Lafarge (delisted in 2006) were not listed. Most of them are also ranked in the Fortune Global 500, according to their turnover. More information on the companies is available in Annex 11.1. Note that except Cemex from Mexico and POSCO from South Korea, all the companies are in OECD countries. The reason behind this is the availability of sustainability information. The UNCTAD *2006 Review of the reporting status of corporate responsibility (CR) indicators* (UNCTAD, 2006, p. 19) shows that in the OECD countries, out of 38 companies, more than 50 % publish a separate CR report, and almost 75% have at least a CR section in the annual report. This percentage fell to 26%, respectively 60% for the low and middle income countries (67 companies studied).

The peer companies in the construction & materials sector were chosen with special attention in order to provide as much information on Holcim's current situation. Lafarge, Cemex and Heidelberg are, like Holcim, top cement producers. They face similar challenges and exposures to sustainability. CRH is also active in the cement industry but has more diversified business activities in the construction & materials sector. It benchmarks the non-cement companies of the sector. Since Holcim was nominated sustainability leader of the construction & materials sector, it is interesting

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to compare its performance with non-cement companies as well. Other enterprises such as Saint-Gobain or Asahi Glass were also considered but finally not included because of the poor quality of their reporting.

Company	Country	Sector
Akzo Nobel	Netherlands	Chemicals
Alcan	Canada	Industrial Metals
Alcoa	United States	Industrial Metals
Anglo American	United Kingdom	Mining
Arcelor	Europe	Industrial Metals
BASF	Germany	Chemicals
Bayer	Germany	Chemicals
BHP Biliton	Australia	Mining
BP	United Kingdom	Oil & Gas Producers
Cemex	Mexico	Construction & Materials
CRH	United Kingdom	Construction & Materials
DSM NV	Netherlands	Chemicals
Dupont De Nemours	United States	Chemicals
Encana	Canada	Oil & Gas Producers
Exxon Mobil	United States	Oil & Gas Producers
HeidelbergCement	Germany	Construction & Materials
Holcim	Switzerland	Construction & Materials
Lafarge	France	Construction & Materials
Norsk Hydro	Norway	Industrial Metals
POSCO	South Korea	Industrial Metals
Rio Tinto Group	Australia	Mining
Shell	United Kingdom	Oil & Gas Producers
Statoil	Norway	Oil & Gas Producers
Xstrata	United Kingdom	Mining

Table 4: Companies selected for the benchmark

3.2 Resources to be included

The choice of the indicators and their quality is crucial for the calculation and validation of the results. The first stage of the thesis concentrated mainly on the collection of data. In order to work efficiently and to avoid spending time on irrelevant data, it was important to define clearly which resources would be considered in the calculation. This section defends the choices made at the beginning of the study. A point that quickly appeared was that even if CSR reporting is improving from year to year, many disparities between the different companies still remain today, and finding the same indicator for all the players included in the study was not an easy task. Of the ten indicators selected originally, seven are reported by more than 70% of the companies (for at least two periods) and 2 by more than 50%. One indicator, the Volatile Organic Compounds (VOC) was not reported by more than 46% of the companies, and by less than 25% in three sectors. For this reason, it has been left out of the study. Waste was

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not included either since Holcim information was limited to cement kiln dust. For the selected indicators, missing data were estimated: if there were no data available at all, the sector average weighted by the revenues of the company was used; if only one period out of the three were missing, the company average weighted by the revenues was used. In the end, the study included 8 indicators. Annex 11.2 shows the availability of the data collected.

The quality of the model and its *explanation power* (Figge & Hahn, 2006a) relies strongly on the choice of the indicators. Ideally the range of indicators should reflect all the impacts of the firm on society. This means that environmentally, the use of air, land, water and any other natural resources should be considered. Socially the model should look at impacts on employees on one hand, and at impacts on the community on the other. Impacts on employees are influenced by the way the company treats them in terms of human rights, operational health and safety (OH&S), gender issues, or the training and education offered. Community impacts are influenced by factors such as corruption or legal matters. Finally, the economic sustainability of the firm should also be assessed. This includes not only the financial sustainability of the company but also aspects such as efficiency of the production processes, corporate governance, risk management, supply chain management or customer relationship management. Addressing all these issues was impossible, mainly for two reasons: first, many are not covered in corporate reports or if so, they are barely comparable across companies. Secondly, some of these issues are hardly quantifiable. Chapter 5 will deal more fully with the incompleteness of the indicators and the impact on the model. For this project, the selection tries to cover as far as possible the *triple bottom line*, but without succeeding in all aspects. Reliability and correctness of the data was also an issue. Each data was carefully collected and results were analyzed more in details when showing any kind of irregularities. The next section discusses briefly the current state of sustainability reporting.

3.2.1 Current issues of sustainability reporting

All the data used to estimate the resources used by the company come from annual and sustainability reports. Whilst annual reports, or at least financial reports, are strongly regulated, sustainability reporting is still mainly left to the firm's discretion. To be useful, annual reports need to fulfill four criteria: understandability, relevance, reliability, and comparability. The information should be understandable by users who have a reasonable knowledge of business and economic activities; the information is relevant when it can influence the economic decisions of users, either based on past

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information or forthcoming events; information is reliable when it does not contain significant mistakes or biases; and finally, information must be comparable over time and between enterprises (IASB Framework, 2001). Sustainable reports are still far from attaining these four characteristics. What the International Standard Accounting Board (IASB) is about to achieve in terms of financial reporting, providing what they call a true and fair view of the company, is only at the embryonic stage in the field of sustainability reporting. Companies are confronted with different reporting standards, such as the Global Reporting Guidelines, the UN Global Compact, the UN declaration of Human Rights, the ILO Core Labor Standards, the OECD Guidelines for Multinational Enterprises, or the OECD Guidelines for Corporate Governance, only to mention the most important (Schäfer, 2005, p.117). They are not regulated by one single authority as they are in financial reporting. The *2006 Review of the reporting status of corporate responsibility indicators* (UNCTAD, 2006) compares 105 enterprises from 71 economies. The conclusion of the study confirms the adoption of CSR reporting by most multinationals, but with little convergence and comparability between each other.

In addition to the global principles, guidelines, or standards, some industries have organized themselves globally or per region to adopt common principles for CSR reporting. The Cement Sustainability Initiative of the World Business Council for Sustainable Development (WBCSD), the European Chemical Industry Council (CEFIC), or the Canadian Association of Petroleum Producers have all developed specific guidelines for their industry. Even if they are often based on a similar approach, the heterogeneity of the standards makes cross-sector comparison difficult. Also, even if economic and environmental capital is often well measurable, this is not the case for social performance and intangible capital (Szekely & Knirsch, 2005, p. 632), which are based on a more qualitative approach.

As a result, selecting the right measure to assess the corporate contribution to sustainability of a firm appeared to be quite difficult. In the end, the indicators chosen were based on the proposals of Figge & Hahn (2006, 2007), the 2006 *Review on the Reporting Status of Corporate Responsibility Indicators (UNCTAD, 2006),* the *KPMG International Survey of Corporate Responsibility Reporting* (KPMG, 2005), and the Global Reporting Initiative (GRI), (2006). Figge & Hahn (2006a, p. 12) propose social indicators such as work accidents, the number of employees, overtime, corporate giving, apprenticeships and education expenditures, gender-related indicators, or legal violations. The UNCTAD *Review* also presents 17 indicators of corporate responsibility. These indicators extend to other topics such as corruption, human rights

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or the value chain. The GRI also suggests different types of economic indicators, such as pension funding or the indirect economic impacts. The next three sections present the chosen indicators for the study.

3.2.2 Economic indicators

Two indicators reflect how well the company is performing economically: the capital employed, and the funding of the organization pension plans. Both indicators were easy to collect, thanks to well-established accounting standards, and even if they do not assess the whole economic sustainability of the firm, they give a reasonable idea on the efficiency of the capital used and the management of the liquidity.

Capital employed

The capital employed is based on a Return on Investment analysis (ROI). ROI is the net income of the firm divided by the capital employed (or assets employed). The latter is the difference between total assets and current liabilities (Anthony & Govindarajan, 2003, p. 288). The result is a special type of return on investment, since it is the net added value and not the net income that is divided by the capital employed. Therefore, it shows the return to society of invested economic capital. Comparison with the benchmark tells us whether the company is capable of generating more added value with its economic capital.

Pensions

The GRI uses the “Coverage of the organization’s defined benefit plan obligations” as an economic indicator (GRI, 2006). It is the first time that pension funding has been taken as an indicator in the SV approach. Hence, it will be interesting to see whether or not it brings additional information on the economic sustainability of the firm or not. Pension systems differ quite a lot between companies. Nowadays, there are two types of pension systems (and many combinations): defined benefit plan and defined contribution plan. Defined contribution plans are less protective for the employees. They are always external to the company, which pays a fixed contribution to the pension fund. The fund then pays the pension benefits to the workers. Benefits usually vary according to variations in actuarial assumptions, and in the end the difference is at the workers’ expense. The risks for the company are limited to the contribution expenses. In a defined benefit plan, workers receive each period a defined pension benefit. The plan can be internal or external to the company, which can bring different level of risk. If it is external, the company only bears the risk of the contribution which

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will this time be adjusted according to variations in actuarial assumptions. If the fund is internal, the company itself has to take responsibility for all actuarial assumptions and find the right investments in assets to finance current pension claims. The difference between the plan benefit obligation and the fair value of the assets is the unfunded part of the plan (Pellens, Fülbier, & Gassen, 2006, p. 426 ff.). Carroll & Niehaus (1998) and Ippolito (1985) have brought to light evidence regarding the negative impacts of pension underfunding. The former showed that the debt rating of the firm is more influenced by a negative pension funding than by a positive funding. In other words, the debt rating is worse when there are additional liabilities due to underfunded plans than it is when there are additional assets due to a well funded plan. This is mainly due to the fact that an underfunded pension plan is competing directly with debt claims. Ippolito (1985) defends the interest of workers who tend to be more exposed when the plan is underfunded. Finally, Franzoni and Marin (2006) argued that underfunded pension plans are usually not fully considered in the market valuation of a company, and therefore companies with significant underfunded pension plans are overvalued.

For those reasons, the undercoverage of pension plan has been included in the model as an economic indicator. As standards FAS 87 and IAS 19 are very similar, the data was always available.

The last point to discuss is a calculation problem. If the company is positively funded, the indicator would be negative (the company is negatively underfunded). If the sector average also has a positively funded pension, then the opportunity cost for the sector would be negative (it would no longer be a cost). To avoid this case, pension data are equal to the maximum between the underfunded status and 0. A second adjustment has to be made in the calculation of the RC ratio. If the opportunity cost is 0 for the company, then the ratio would be infinite. Therefore, in this scenario, it was arbitrarily set to 10. Whilst the negative impacts of an underfunded pension plan are described in the literature, there is no evidence of the positive impacts of a funded plan, therefore pension funding should be considered only when negative.

3.2.3 Environmental indicators

Corporations have various impacts on the environment. Their production processes release different greenhouse gases and pollutants. They consume resources such as raw materials or water and therefore contribute significantly to the scarcity of those resources. Furthermore they are often energy-intensive organizations and, depending

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on the industry, they leave significant footprints on the environment. The environmental indicators should try to assess all those areas.

The emissions of a company are nowadays quite well reported. Most of the selected corporations publish their carbon dioxide (CO_2) emissions, as well as emissions from other gases. Companies also report indirect greenhouse gases. Direct emissions come from sources owned by the company, while indirect emissions come from an external player but are the consequence of the activities of the company (GRI, 2006). The waste generated and recycled and the use of water can be good indicators for measuring the use of raw materials. Finally, rehabilitation programs for closed production sites indicate how successful the company is in avoiding any footprints on the environment.

Unfortunately, and again because of the unavailability of data, the question of waste management and its footprint on the environment could not be included in the study. Lastly, it is important to keep in mind that at the end it is always the difference with the benchmark in terms of value created per unit of resources used that is relevant. There is thus no need to calculate the percentage of inputs that are left as waste, or any other kind of ratio.

Particles such as dust and other VOC such as methane are also not included in the scope of the study.

<u>CO_2 emissions</u>

Originally, the total amount of greenhouse gases in CO_2 equivalent was chosen as a CO_2 indicator. This had the advantage of including all types of GhG emissions (WBCSD, 2004, p. 62 ff.). Projects such as the Carbon Disclosure Projects have started reporting this type of data for more than 3’000 companies. Unfortunately, even though these reports are based on responses to precise questions, including the global amount of indirect GhG, only a few companies answered concisely. For this reason, it was decided to consider only direct and indirect emissions of CO_2. One difficulty for some companies was to find how much indirect CO_2 they emitted. If the data was not available, it was estimated based on a sector average or the GhG emissions if these were reported.

<u>NO_x and SO_x emissions</u>

Most standards and guidelines propose to report nitrogen oxides (NO_x), sulfur oxides (SO_x) as well as other air pollutants (GRI, 2006). NO_x are all kinds of nitrogen oxides, including nitrogen dioxides (NO_2), but should not be confused with nitrous oxide (N_2O)

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which is a GhG. “The main source for NO_x is the burning of fuels, particularly petroleum products” (UN Statistics Division, 2005). “SO_x are formed from the sulfur contained in raw materials such as coal, oil and metal-containing ores during combustion and refining processes” (Environment Canada, 2008). Both gases contribute to the acidification process. “Acidification is the process whereby air pollution, mainly ammonia, sulfur dioxide and nitrogen oxides, is converted into acid substances” (European Environment Agency, 2008). Some companies report only nitrogen dioxides (NO_2). In that case, it is assumed that they do not emit any other nitrogen oxides. Similarly, some only report sulfur dioxides (SO_2).

Water use

Water is a scarce resource, essential to human life, but unfortunately most of the time used in an unsustainable manner. Many regions of the world will face moderate or severe water shortages in the future (UN Environment Programme (UNEP), 2006, p. 18). There is a need to improve the use of water. Sustainable companies have to consider two impacts: the general consumption of water and the amount of wastewater versus cleaned water discharged by the firm. Ideally both impacts should be assessed by the model, namely how much financial value the company generates per cubic meter of water used, and how much value per wastewater is produced. This would show whether the process is efficient in terms of water consumption and also whether the company treats the discharged water with due regard to the environment. In this study, only the total consumption of water was considered.

3.2.4 Social Indicators

The present study includes three social indicators: total workforce, the number of time-lost injuries, i.e. the injuries leading to incapacity to work during at least one day, and corporate investment, which is included in the added value calculation. All these data were relatively available. Issues such as human rights, corruption, or other legal matters are unfortunately not included. These issues are very rarely reported, probably due to the sensitivity of the topic and the bad publicity that could be engendered, and also they are based on qualitative rather than quantitative evidence. Further information on the reliability and quality of the collected data and a discussion of other possible indicators is available in chapter 5.

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Employees

This indicator reflects the value generated per employee. If the company makes an important contribution to society with few employees, it uses its human capital in a very efficient manner. Note that the size of the workforce of a company inside a same sector can differ considerably, depending on the proportion of activities outsourced to contractors. But, including the contractors in the workforce would result in double counting if the benchmark were a national or regional economy. For this reason contractors were not included. Other details such as employee turnover rates, gender structure of the workforce, or number of disabled people working in the company could be add to enhance the quality of the results.

Lost time injuries (LTI)

Although the number of injuries a company experiences while operating seems to be a very good indicator of its efficient use of human capital, there are still many questions relating to its comparability and availability. Companies report various injury indicators, but there is a lack of congruence between them. Thus, some report the number of injuries during the year, others only the number of injuries resulting in a loss of one, two, or three days, depending on the country and its regulations, whilst others only report injury rates per million hours worked or 200'000 hours worked. Finding exactly the same indicators for each company proved to be impossible. Therefore, estimations based on the reported indicators have been used in order to obtain consistent numbers. For example, when only injuries per total hours worked were published, the amount of total injuries was found by multiplying the ratio by 235 working days of 8.4 hours each day and by the size of the workforce, assuming an 80% fulltime equivalent average. Some countries account lost time injuries when the victim has missed at least three working days. In those cases, the conversion table of the CEFIC was used: one lost day injury equals 3.024 x 3-day-FR^0.668 (CEFIC, 2006, p.13).

3.3 The return figure

As explained in chapter 2, the return figure will determine from which perspective the corporate contribution to sustainability is addressed.

The financial added value is the return figure that was used in this study and corresponds "to the contribution of an economic sector/entity to the society" (Bao & Bao, 1989, p. 701). There are different ways to calculate the financial added value of a firm. There is a gross added value and a net added value. Gross added value is the

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sales minus the brought-in materials and services. Net added value is the gross added value minus depreciation (Bao & Bao, 1989, p. 701). In this study, it was decided to follow the example of Figge & Hahn (2007) and to use the net added value increased by the community investments. In this study, the net added value was estimated as follow:

Net Added Value = profit before taxes + interest expenses + personal wages and benefits + community investment

The exact calculation of the net added value or the decision to use the net added value rather than the gross added value can be discussed at great length. What is important here is to use the same calculation for all companies included in the study in order to maintain consistent comparisons.

All necessary information was found in the financial statements of the different companies, apart from the community investment that was either not reported, in which case it was assumed to be equal to zero, or reported in the sustainability report. Otherwise, the availability of the data was quite good due to strict national and international regulations. Only the wages were not always published and had to be estimated for three companies. Annex 11.2 also shows the availability rate of the data for the return figure.

One could argue that community investments should be used as a social indicator. The reason for this choice is that community investments are not a form of social capital. They are rather a contribution to society, like wages or taxes. A company that generates more euros per lost-time injury than the benchmark is more socio-efficient. With community investments this is not the case. The ratio added value per euro invested in the community does not reflect any efficiency in sustainability. Therefore, adding community investments to the net added value seems more appropriate, and also takes into consideration the efforts made by some companies in that field. Only 50% of the companies in 2004 and 71% in 2006 reported their community investment. No estimations were made when no information was reported. In this case, it was assumed that the company was not making any community investments.

Finally, note the distinction between the valued added by the firm and the financial added value. Today, added value is used mostly to refer to the financial added value. However, a firm could deliver non-financial value to society as well. In this study, the financial added value was used. Chapter 5 discusses in more detail the consequences for the evaluation.

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3.4 Comparison with the NeW and ADVANCE Project studies.

When Figge & Hahn first published the *SV approach* in 2004, they had not carried out any survey that proved the practicability of the study. Since then, they have performed two empirical surveys. The first one, called the ADVANCE Project (2006a, 2006b), for ***A**pplication and **D**issemination of **Va**lue-Based Eco-Rati**n**gs in Finan**c**ial Mark**e**ts* applied the SV concept to assess the environmental performance of 65 European companies of the manufacturing sector. The study first looked at the performance of the 65 companies compared with the EU 15 economy from 2001 to 2003. Then, a second assessment was made to see if in 2010 the selected companies would meet the EU 15 goals. "It shows which companies are most vulnerable to the 2010 emission reduction targets and potential future regulation" (Figge & Hahn, 2006b, p.12). The second survey was the "Nachhaltig erfolgreich Wirtschaften" (NeW) study. This time, Figge & Hahn (2007) assessed nearly 30 German companies from 13 different sectors. Like in the ADVANCE project, they used two benchmarks: the national economy and the future.

Both surveys form the basis of the model used in this research. The process of calculating the SV and RC of companies is exactly the same, but there are some differences in the model. First, the model developed here focuses more on the plausibility and the reliability of the results while the NeW and ADVANCE studies tried to prove the practicability of the method. Secondly, the present study opens up the European frontier to assess companies worldwide and within some specific sectors that have not been considered yet. Thirdly, the purpose here is less to see which companies are the best performers, and which are not, and how they will score in the future, but rather to focus on Holcim's performance relative to that of other companies. Fourthly, it is not an analysis of all sectors but only of the construction & materials one, together with a few others selected for their similarities. Finally, the benchmark used in this study is the average of the companies studied, just as in the ADVANCE and NeW studies it was either the German or the European economy. As explained in chapter 2, this is mainly due to the lack of data worldwide in the observed sectors. Thus, the output of the work and its purpose are different. The NeW and ADVANCE studies were not used to improve the contribution to sustainability of one company. They presented evidence on current contributions and what to expect for the future.

The ADVANCE project makes five observations resulting from an in-depth analysis:

- "the SV of companies depends on their sector affiliation;
- the performance of companies within sectors varies considerably;

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- the sectors are characterized by specific strengths and weakness;
- not all companies succeeded to improve their environmental performance between 2001 and 2003;
- the 2010 EU performance targets affect the companies to different degrees." (Figge & Hahn, 2006b, p.11)

The ADVANCE study went quite far in the assessment of the environmental performance of European companies. The scope of the study and the quality of the data goes beyond the possibility of this project. Nevertheless neither the ADVANCE study nor the NeW one analyzed the implications of the 5 assertions made above. This paper also states observations based on the model results. But in addition to that, it checks whether or not these results make sense before evaluating the strengths and weaknesses of a company or a sector.

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4 PRESENTATION, INTERPRETATION AND DISCUSSION OF THE RESULTS

Processing the collected data produced numerous results. The main ones are presented, interpreted and discussed in this chapter. The others are presented in the annex. This paper tries to respond to the two following objectives:

1. *To assess Holcim, using the SV approach, in order to better understand its challenges in terms of sustainable development, and to identify its strengths and weaknesses in this field compared with, among others, the construction & materials sector.*
2. *To assess the SV approach itself and the consistency and reliability of its results, in order to determine possible applications for the method.*

This chapter brings an answer to both objectives. Section 4.1 presents the results of the cross-sector analysis, and of the construction & materials sector analysis and interprets them, focusing on Holcim. Based on this, four observations are made. Section 4.2 discusses these observations and tests their plausibility and reliability.

4.1 Presentation of the results

Once all the data were collected, the calculation of the SV was possible. Following the process described in chapter 2, each company was assessed individually. The performance of each individual company is presented in the annex. For each firm, a sheet describes the performance data for the years 2004 to 2006, i.e. the resources used by the firm, the opportunity costs of the firm of using those resources, and the value contribution to society. It is always given in relation to all sectors and in relation to the specific sector. Finally, the SV and the RC ratio are also presented for each period and relative to both benchmarks. It is completed by a chart that presents the areas where the firm generated positive financial value, that is, when it outperformed the benchmark. Figure 1 shows how well Holcim performed in the areas assessed, and shows the calculated contribution to sustainability for each of the resources used by Holcim. When the line is above the neutral contribution, Holcim contributed positively to sustainability. Details concerning the calculation are presented in chapter 2 and in the annex.

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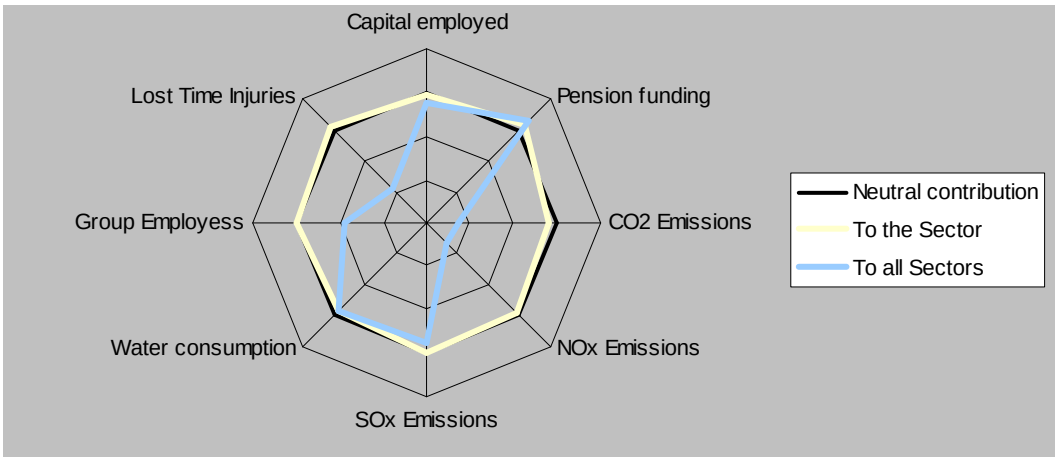

Figure 1: Value contribution per type of resources for Holcim in 2006

The chart presents two interesting trends. First, there is a significant difference between the intra-sector analysis and the cross-sector analysis. In the first, Holcim performed more or less at the average. It should be noted that Holcim only performed at the average because CRH, due to its more diversified businesses, distorted the results. In fact, if the CRH performance is disregarded, Holcim was always first or second in the sector. In the cross-sector analysis, Holcim performed poorly. The chart shows that except for pension funding, capital employed, water consumption, and SO_x emissions, Holcim performed way below the average. This will be discussed below. The chart represents the SV contribution and not the RC ratio. When analyzing the return to cost ratios of each indicator, the differences are more emphasized on the graph, sometimes to a point where they are no longer legible. For this reason only the SV has been represented graphically.

After carrying out calculations for each company, the results were gathered together and ranked. There are four rankings: A ranking of the SV generated, and one of the RC realized, each time with regards to specific sectors and to all sectors.

4.1.1 Cross-sector results

Tables 5 and 6 show the rankings relative to the five sector average. Table 5 shows that Holcim was third from last in 2004, fifth from last in 2005 and second from last in 2006. It also states the amount that Holcim contributed to sustainability. The contribution was negative in the three periods. In 2006, the additional value that could have been delivered to society, if Holcim's economic, environmental and social capital were used by an average benchmark company, was 9.9 billion euros. Only Lafarge performed worse. The company that produced the most value was Exxon Mobil with

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27.8 billion euros. The table shows how much added value a company generated with its resources compared with the benchmark average. It makes sense to use the number only for a comparison between companies. Thus, it could be instructive to know that Holcim contributed less to sustainability than the benchmark, to a total of 9.9 billion euros. However, the scale of the contribution remains very subjective and its significance is limited.

Sustainability Value ranking:				All Sectors	
2004		2005		2006	
Exxon Mobil	16'115'619'473	Exxon Mobil	28'310'334'188	Exxon Mobil	27'828'357'93
Shell	11'531'465'567	Shell	25'573'899'437	Statoil	12'243'078'03
Statoil	6'639'873'885	Statoil	9'807'373'005	BP	12'214'200'23
BP	6'530'529'821	BP	9'751'652'132	Shell	11'771'369'42
BHP Biliton	3'182'120'413	BHP Biliton	4'581'752'775	BHP Biliton	7'711'878'64
Norsk Hydro	2'312'735'989	Norsk Hydro	3'478'009'464	Norsk Hydro	4'350'325'66
Bayer	757'457'497	POSCO	487'252'706	Rio Tinto Group	1'050'764'22
POSCO	504'977'376	Dupont De Nemours	237'828'666	Bayer	-181'629'45
Dupont De Nemours	-259'874'957	Bayer	-383'335'141	POSCO	-693'788'29
Arcelor	-452'855'569	DSM NV	-1'108'132'595	DSM NV	-1'179'288'49
DSM NV	-609'985'593	Rio Tinto Group	-1'438'750'960	Arcelor	-1'451'511'76
Rio Tinto Group	-1'756'270'252	Arcelor	-2'012'414'784	Dupont De Nemours	-2'631'375'14
CRH	-1'814'909'551	Xstrata	-3'088'300'275	Encana	-2'806'875'33
Encana	-2'155'760'237	Encana	-3'340'163'537	Alcan	-3'226'849'64
Akzo Nobel	-2'173'105'460	CRH	-3'916'174'219	CRH	-3'486'532'68
Xstrata	-2'621'990'539	Alcan	-5'055'977'668	BASF	-4'095'789'77
Alcoa	-3'262'003'216	Akzo Nobel	-5'586'473'837	HeidelbergCement	-4'732'660'86
Cemex	-3'291'819'698	Alcoa	-5'710'929'594	Akzo Nobel	-4'781'883'53
BASF	-3'496'064'966	HeidelbergCement	-6'328'315'740	Alcoa	-4'819'706'47
HeidelbergCement	-4'394'531'423	Holcim	-8'008'979'180	Xstrata	-5'484'321'64
Alcan	-4'835'259'915	Anglo American	-8'240'365'965	Anglo American	-7'467'152'34
Holcim	-5'034'911'801	Cemex	-8'722'556'877	Cemex	-9'449'330'28
Anglo American	-5'213'235'574	BASF	-9'321'243'370	Holcim	-9'926'088'28
Lafarge	-6'202'201'270	Lafarge	-9'965'988'632	Lafarge	-10'755'190'15

Table 5: Ranking of companies from the five sectors, according to their SV

As explained in chapter 2, the SV does not consider the size of the company at all. Thus, there is a tendency to find companies with the highest absolute values at both extremes of the ranking. To solve this problem, Figge & Hahn (2006a, p.8) proposed using a RC ratio. The RC ratio equals the added value divided by the opportunity cost of using all the resources. Table 6 shows the ranking of the RC ratios of the companies from the 5 sectors. It provides more information on sustainability leaders. It enables a better comparison and constitutes a factor of the sustainability contribution of the firm. A company that has a RC of 2 generates two times more value than the benchmark would do using the company resources. In table 6, the companies that had a negative SV had a return below 1. This is not surprising, given that the SV is negative when the opportunity cost is bigger than the financial added value, and that

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the RC ratio is the financial added value divided by the opportunity cost. In 2006, the RC leader was Statoil, which generated 4.1 times more value than the average. Holcim generated only 0.36 times more, or almost three time less. This means that for each ton of CO_2 emitted, or for each LTI, or each employee, Holcim returned on average three times less money to society.

Return to Cost ranking:		All Sectors			
2004		2005		2006	
Statoil	3.551	Statoil	3.561	Statoil	4.137
Norsk Hydro	1.743	Shell	2.198	Norsk Hydro	2.060
Exxon Mobil	1.700	Exxon Mobil	1.870	BHP Biliton	1.868
Shell	1.583	Norsk Hydro	1.784	Exxon Mobil	1.845
BHP Biliton	1.567	BHP Biliton	1.438	BP	1.543
BP	1.340	BP	1.361	Shell	1.378
POSCO	1.112	POSCO	1.087	Rio Tinto Group	1.118
Bayer	1.107	Dupont De Nemours	1.038	Bayer	0.983
Arcelor	0.948	Bayer	0.956	Arcelor	0.874
Dupont De Nemours	0.946	Rio Tinto Group	0.854	POSCO	0.872
DSM NV	0.757	Arcelor	0.828	BASF	0.768
BASF	0.745	DSM NV	0.654	Encana	0.703
Rio Tinto Group	0.718	Encana	0.605	Dupont De Nemours	0.683
CRH	0.690	Alcoa	0.561	DSM NV	0.650
Akzo Nobel	0.687	BASF	0.552	Alcan	0.627
Alcoa	0.657	Anglo American	0.543	Alcoa	0.616
Encana	0.639	CRH	0.536	CRH	0.614
Anglo American	0.613	Xstrata	0.492	Anglo American	0.608
Lafarge	0.426	Akzo Nobel	0.464	Akzo Nobel	0.513
Xstrata	0.401	Alcan	0.454	HeidelbergCement	0.405
Alcan	0.397	Holcim	0.363	Holcim	0.361
Holcim	0.377	Lafarge	0.344	Lafarge	0.358
Cemex	0.311	HeidelbergCement	0.284	Xstrata	0.358
HeidelbergCement	0.252	Cemex	0.243	Cemex	0.219

Table 6: Ranking of the companies from the five sectors, according to their RC ratio

There can be some significant differences between the SV and RC rankings, depending on the size of the companies included in the study. Table 7 presents the difference between the two rankings in 2006. Holcim, which was second to last in table 5, is now fourth from last or 21st out of 24. Exxon which was first is now fourth, and so on. The ranking is now adjusted by taking into account the size effect of companies, and shows which company uses its resources in the most efficient way.

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Company	RC ranking	SV ranking	difference
Statoil	1	2	1
Norsk Hydro	2	6	4
BHP Biliton	3	5	2
Exxon Mobil	4	1	-3
BP	5	3	-2
Shell	6	4	-2
Rio Tinto Group	7	7	0
Bayer	8	8	0
Arcelor	9	11	2
POSCO	10	9	-1
BASF	11	16	5
Encana	12	13	1
Dupont De Nemours	13	12	-1
DSM NV	14	10	-4
Alcan	15	14	-1
Alcoa	16	19	3
CRH	17	15	-2
Anglo American	18	21	3
Akzo Nobel	19	18	-1
HeidelbergCement	20	17	-3
Holcim	21	23	2
Lafarge	22	24	2
Xstrata	23	20	-3
Cemex	24	22	-2

Table 7: Difference between the SV ranking and the RC ranking

These initial results were quite negative for Holcim and the cement industry in general. However, many could argue that it is not possible for Holcim to perform so badly since the company has been broadly recognized as a pioneer of sustainability. In fact, table 6 shows an interesting trend. The companies tend to be grouped by sector in the ranking. Chemicals companies finished between rank 8 and 19, cement companies all ranked worse than 17, industrial metals companies ranked between 2 and 16, mining companies between 3 and 23, and finally, oil and gas companies between rank 1 and 12. Hence, there is some evidence that, according to the model, the sector has an impact on the sustainability performance of a company, and that the construction & materials sector performs rather poorly. This is also confirmed by table 8. Table 8 displays the rankings of the SV and RC ratio of each sector. The SV and RC ratio were calculated using the average efficiency of each sector compared with the five sectors average.

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Sustainability Value:			Construction & Materials			
2004			2005		2006	
Oil & Gas Prod.	7'732'345'702	€	Oil & Gas Prod.	14020619045	Oil & Gas Prod.	12'250'026'058
Industrial Metals	-1'146'481'067	€	Industrial Metals	-1762811975	Mining	-1'047'207'780
Chemicals	-1'156'314'696	€	Mining	-2046416106	Industrial Metals	-1'168'306'100
Mining	-1'602'343'988	€	Chemicals	-3232271255	Chemicals	-2'573'993'280
Const. & Materials	-4'147'674'748	€	Const. & Materials	-7388402930	Const. & Materials	-7'669'960'453

Return to Cost:		Construction & Materials			
2004		2005		2006	
Oil & Gas Prod.	1.548	Oil & Gas Prod.	1.752	Oil & Gas Prod.	1.6
Chemicals	0.835	Mining	0.816	Mining	0.9
Industrial Metals	0.831	Industrial Metals	0.800	Industrial Metals	0.8
Mining	0.784	Chemicals	0.672	Chemicals	0.7
Const. & Materials	0.414	Const. & Materials	0.347	Const. & Materials	0.3

Table 8: Rankings of the five sectors according to the SV and the RC of each sector

If the construction & materials sector contributed less to sustainability, it would be interesting to know why, or at least, in which field. Figure 2 presents the contribution of the eight types of sustainable capital for the construction & materials sector. The chart is very similar to figure 1, which shows Holcim's performance compared with the five sectors average. If the blue line is above the neutral contribution, the sector contributed more to sustainability than the benchmark. According to this, the construction & materials sector outperformed the five sectors average only with the pension funding. All the other types of capital contributed less to sustainability than the benchmark. The sector performed really badly in terms of LTI, group employees, CO_2 emissions, and of NO_x emissions. It does slightly better in terms of capital employed, SO_x emissions and water consumption. More information on those results is shown in the annex 11.8.

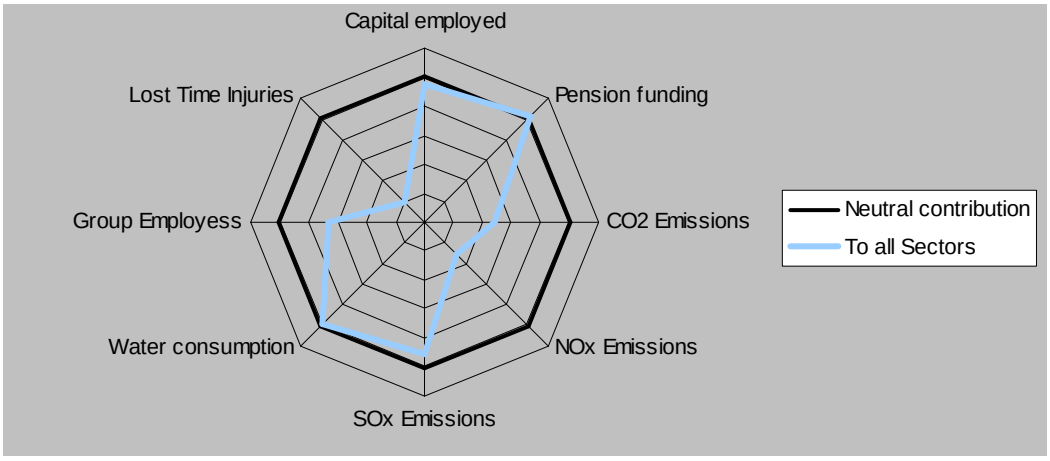

Figure 2: Value contribution per area for the construction & materials industry in 2006

Based on the cross-sector analysis of the model, the construction & materials industry contributed less to sustainability than the four other sectors. Moreover, if CRH is not considered in the analysis, the cement companies performed even worse. The reason for this poor performance is detailed in section 4.2. The main observation to draw from this conclusion is the following:

<u>Observation 1:</u> *According to the model, the construction & materials sector, and, more specifically the cement sector contributes less to sustainability than the other sectors, especially in the use of* CO_2 *and* NO_x *emissions, lost-time injuries, and group employees.*

4.1.2 Intra-sector results

This second section concentrates on the construction & materials results and then more specifically on Holcim. In this second model, the benchmark was not the five sector averages but the construction & materials average. The figures presented in table 8 must be interpreted differently from the ones in tables 5 and 6. This time, the SV indicates how much more value a company could deliver to its stakeholders compared with the sector average, and the RC ratio indicates how much more value the company actually delivered relative to the sector.

Interestingly, the intra-sector ranking was not respected in the cross-sector ranking. For example, Holcim was second to last in the 2006 cross-sector ranking of the SV, only doing better than Lafarge, while it was third in the intra-sector results, beating Lafarge and Cemex. The same phenomenon occurred with the RC ratio and in other sectors. The benchmarks used for the cross-sector and for the intra-sector analysis were not the same. The cross-sector ranking ordered the companies according to their performance compared with the five sectors average. In the intra-sector ranking, companies were ordered according to their performance compared with the sector average. In other words a company can use its resources in a more similar way than the five sectors average than the sector average. In such a case, its SV in the cross-sector ranking will be lower and the ranking may not be respected in both analyses. Therefore, it is always very important to consider the starting assumptions when interpreting the results.

The following observations can be drawn from table 9 below. First, CRH led the sector significantly during the three years, being at least twice as efficient as the other companies. Secondly, Holcim performed well in the years 2004 and 2005, ending second both times, and did slightly less well in 2006 where it finished third. Regarding

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the other competitors, Lafarge's efficiency remained stable between 0.83 and 0.85. Cemex performed worse and worse each year sliding from 0.82 in 2004 to 0.6 in 2006. Finally, Heidelberg improved strongly from year to year climbing from the last position in 2004 to second position in 2006 with a return bigger than the cost.

Sustainability Value:			Construction & Materials			
2004			2005		2006	
CRH	2'243'908'443	€	CRH	2049236628	CRH	2'626'275'650
Holcim	-227'113'707	€	Holcim	135259891.5	HeidelbergCement	388'395'481
Cemex	-310'978'094	€	HeidelbergCement	-205593564.4	Holcim	-146'959'624
HeidelbergCement	-769'198'874	€	Lafarge	-954177245.6	Lafarge	-1'123'025'763
Lafarge	-936'617'768	€	Cemex	-1024725710	Cemex	-1'744'685'744

Return to Cost:		Construction & Materials			
2004		2005		2006	
CRH	2.248	CRH	1.830	CRH	1.9
Holcim	0.931	Holcim	1.030	HeidelbergCement	1.1
Lafarge	0.831	HeidelbergCement	0.924	Holcim	0.9
Cemex	0.827	Lafarge	0.846	Lafarge	0.8
HeidelbergCement	0.658	Cemex	0.732	Cemex	0.6

Table 9: Rankings within the construction & materials sector according to the SV and RC ratio of the companies

To summarize, according to the model:

<u>Observation 2:</u> *CRH performed much better than the cement companies*

<u>Observation 3:</u> *Holcim efficiency failed to further improve between 2005 and 2006 or improved less than the sector average.*

<u>Observation 4:</u> *HeidelbergCement overtook Holcim in sustainability performance in 2006.*

The next section discusses in details the four observations highlighted in this section.

4.2 Discussion of the results

According to the model, Holcim and most of the cement companies are not performing well. However, before drawing any conclusions, it is important to know if the model works correctly. This section goes through each observation made in the previous section and looks at whether the results stem from a weakness of the model or if they are a true reflection of reality. This section is based on quantitative testing, personal communications and other documents cited.

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4.2.1 Observation 1: bad performance of the construction & materials sector.

<u>Observation 1:</u> *According to the model, the construction & materials sector, and, more specifically the cement sector contributes less to sustainability than the other sectors, especially in the use of CO_2 and* NO_x *emissions, lost-time injuries, and group employees.*

This observation is based on the results of the model, presented in figure 2 and in annex. The construction & materials sector contributed less to sustainability than the four other sectors, especially in terms of emissions (CO_2, NO_x and SO_x), employees and lost-time injuries.

Discussing the performance of the whole construction & materials sector compared with the four other sectors of the study may be a difficult task based only on the indicators chosen in the model. The results for CRH, which is a diversified construction & materials company, differed from those of the four cement companies. A description of the difference between CRH and the cement industry is presented in the next sub-section. For now, the focus will be on the poor performance of the cement sector.

The cement companies are aware of the challenges facing their industry. In 1999, they launched the Cement Sustainability Initiative in order to respond to the main concerns they are facing, namely: “restoring exhausted limestone quarries, minimizing waste and carbon dioxide in its manufacturing process”. They designed an agenda for action and committed themselves to work on improving sustainability (WBCSD, 2000).

<u>CO_2</u>

Cemex, HeidelbergCement, Holcim and Lafarge have all achieved a RC ratio for CO_2 emissions below 0.25, the lowest ratios of the study. The cement industry generates about 5% of global CO_2 emissions (WBCSD, 2007; Hendriks et al., 1998). In comparison with other “industrial commodities”, the CO_2 emissions per ton of product are still relatively low in the cement industry, but quite high relative to the value of the material (Carbon Disclosure Projects, 2006). Examples of other energy intensive industries are glass, lime, non ferrous metal, paper or steel (EUROFER, 2004). As a matter of fact, POSCO and Arcelor, two steel companies, also have a RC ratio for CO_2 emissions between 0.2 and 0.3. POSCO emitted 2.13 tons of CO_2 per ton of steel in 2006. As a comparison, Holcim emitted 0.653 tons of CO_2 per ton of cementitious material in the same year, almost four times less. Holcim sold one ton of cement at around 67 euros per ton. POSCO sold one ton of steel at 775 euros. Thus, Holcim collected 102 euros per ton of CO_2 and POSCO 364 euros. There are two things to

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remember when looking at the low RC on CO_2 emissions of the cement companies. First, producing cement is intensive in CO_2. In the production process of cement, limestone is heated at temperatures above 1'000 degrees Celsius. The chemical reaction that transforms the limestone into clinker releases a lot of CO_2. This process emits almost one ton of CO_2 per ton of clinker produced. Around 60% come from the chemical reaction and the other 40% from the energy needed to heat the kiln (WBCSD, 2007, p. 100). The clinker is then ground and mixed with other materials to make cement (Worrell et al. 2001, p. 309), enabling the emission of CO_2 per ton of cement to be reduced to 0.653 for Holcim (Holcim, 2006). Second, cement is a cheap material but very resistant and is today extremely important in the building and construction industry. As a result of this, the financial value per ton of CO_2 emitted can only be low. The cement sector certainly has a low eco-efficiency, at least in terms of CO_2 emissions.

Regarding the other industries, as already mentioned, steel producers also performed badly in terms of CO_2 emissions. Alcan and Alcoa are more diversified industrial metals companies and were closer to the benchmark in terms of RC on CO_2 emissions. Curiously, Norsk Hydro performed much above the average. For the others, the disparity was also great in the chemicals industry where DSM and Dupont both ended up with a ratio of 0.5, and Bayer and BASF were way above average. The analysis of those results is beyond the scope of the study. Reasons to explain these disparities could include differences in reporting, biases in the relation between the financial added value and the emissions, differences in the business segment, or unreliable data for certain companies.

<u>NO_x and SO_x emissions</u>

In the cement industry, NO_x emissions are the result of fuel combustion during clinker production. SO_x emissions are a result of the burning of fuel and of the chemical reaction occurring in the clinker kiln. The whole process emits much more NO_x (~2.4g/kg of cement) than SO_x (~0.3g/kg of cement) (Josa *et a*l. 2004, p. 1317-18), explaining why cement companies had a RC for NO_x emissions (between 0.15 and 0.25) smaller than the RC on SO_x emissions (between 0.4 and 0.7). Six other companies also had a RC on SO_x emissions below one: Alcan, Alcoa, Anglo American, Arcelor, Rio Tinto and Xstrata. They are all mining or industrial metals companies. Two companies were below one in terms of RC on NO_x emissions: DSM and Encana. Note that, as already mentioned, air emissions in the chemicals sector may be biased by the "too good" results of Bayer and BASF. Xstrata also reported an

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abnormally low emission of NO_x compared with the other companies of the mining sector. A deeper analysis would require checking the reliability of the information.

Group employees

The RC ratio on group employees expresses how much more or less financial value per employee a company is capable of producing. In other words, it indicates how much more financial value is brought by an employee of company xyz than the benchmark. The RC ratios on group employees in the construction & materials sector were all between 0.35 and 0.4 (note that CRH performed at the sector average here). Other companies that performed worse or as badly were Akzo Nobel, Alcan, Alcoa, Anglo American, Arcelor, BASF, Bayer, DSM, Dupont de Nemours and Xstrata. Based on this, the chemicals and industrial metals sectors seem to be, like the cement industry, intensive in human capital relative to the financial added value. Xstrata and Anglo American performed too differently from BHP Billiton and Rio Tinto to be able to make any general statement on the mining sector. Finally, the oil & gas sector, as in most other fields, led the ranking again, maybe due to the record earnings registered during those last years.

Lost-time injuries

The construction and materials sector had less value generated per lost-time injuries (LTI) than the other sectors. With an average RC ratio of 0.19 euros per LTI, the sector did much worse than the four other sectors (between 0.66 and 5.14 euros per lost time injury). This means that the construction material generated five (=1/0.19) times less value per LTI than the five sector averages. LTI are influenced by the numbers of employees. A company with many employees is likely to have more LTI than a company with only a few employees. However, when looking at the LTI per employee figures, the cement industry still performed worse than the other sectors. Thus the cement industry is also less effective in term of LTI. The study does not explain the reason for this.

Conclusion

Cement is a product that is intensive in capital but has a low financial value. The model calculated the SV and the RC based on the efficiency of the companies compared with the benchmark. Efficiency is the added value per resource used. Hence, the conclusion of the model may be appropriate according to an efficiency analysis. However, it only considers the relation between the financial added value,

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and environmental and social impacts. It does not look at the overall effectiveness. Therefore, it is a fact that the cement industry is less efficient in term of air emissions, employees or LTI. But it is not sure that it is less effective. The analysis of the first observation revealed two points that are important for the rest of the study. First, the result in terms of efficiency cannot be denied. The cement industry really seems to produce less financial value per unit of environmental and social impacts. Second, it shows the first limits of the model: comparing companies' efficiency across sectors seems difficult and the model does not consider additional issues such as the importance of an industry for society. These two points will be discussed again in chapter 5. For now, let us analyze the other observations.

4.2.2 Observation 2: CRH performance

<u>Observation 2:</u> *According to the model, CRH performed much better than the cement companies*

As already mentioned in the previous section, CRH performed very differently to the cement companies. It was the only company from the sector that contributed every year to sustainability (positive SV), and it was much better ranked in the cross-sector comparison. An analysis of the sources of revenues for the different companies of the sector helps in understanding this difference. Table 9 shows the share of revenue per type of business activities for companies in the construction & materials sector. In 2006, only 40 % of CRH revenues came from the materials business (cement, concrete, aggregates or asphalt), while the other companies had more than 80% of their revenues generated from this activity. At the present time, and according to the WBCSD Cement Sustainability Initiative reporting guidelines, cement companies should report only indicators related to their cement activities (at least in terms of emissions), in order to better compare efficiency between companies (WBCSD, 2005a, b). Therefore, in terms of eco- or socio-efficiency, financial value is attributed exclusively to the impacts of cement production, influencing negatively the sustainable performance of the whole firm. CRH, with an annual production of 14 million tons of cement that accounts for around 5% of its total revenues, emitted a lot less CO_2, NO_x, SO_x, or any other type of emission per euro of financial added value than the other companies, which all earned between 47 and 58% of their revenues from the cement business.

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Revenue shares	Cement	Aggregates, concrete & asphalt	Others
Cemex2004	73%	27%	0.2%
Cemex2005	48%	50%	2%
Cemex2006	48%	51%	0.2%
CRH2004	40%		60%
CRH2005	40%		59.8%
CRH2006	41%		59%
Heidelberg2004	51%	31%	17.5%
Heidelberg2005	50%	31%	18%
Heidelberg2006	51%	32%	16.8%
Holcim2004	68%	32%	0%
Holcim2005	57%	43%	0%
Holcim2006	58%	42%	0%
Lafarge2004	47%	33%	19.7%
Lafarge2005	48%	34%	19%
Lafarge2006	52%	38%	9.5%

Table 10: Business activities of the cement companies included in the study

In addition to the superior performance of CRH due to its more diversified business, it is interesting to notice that recently the other cement companies have also started to expand into new sectors. Even though they have not expanded into many other construction and materials segments like CRH, they all acquired and increased their aggregates and concrete operations. The trend started with the Lafarge acquisition of Redland plc in 1997 followed by Blue Circle in 2001 (Lafarge, 2007a). The Lafarge sale of its roofing division set the tone for a global cement and aggregate group. More diversification is not to be expected in the near future. Holcim followed up the dual product strategy between cement and aggregates (along with water, the main materials for the preparation of concrete) with the acquisition of Aggregate Industries in 2005 (Holcim, 2007a). Likewise, Heidelberg is also pursuing vertical integration. In 2007, the German cement company acquired Hanson PLC, a leading player in the aggregates and building materials sector (Heidelberg, 2007a). Finally, Cemex aggregates and concrete business also grew from 2004 to 2006, from 26.9 % of the revenues to 51.5 % (Cemex, 2007a). Here again, even if the trend is towards diversification, none of the cement companies expanded its activities in the same way as CRH. They have all remained very much focused on cement, aggregates and their downward products: asphalt and concrete. This would explain why CRH performed so differently in terms of sustainability value, and why the comparison between the cement companies and CRH is difficult. It confirms the doubts raised before on the practicability of the method for a cross-sector assessment. The next two sub-sections will focus on Holcim only and its performance in the intra-sector analysis.

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4.2.3 Observation 3: the lack of efficiency improvement at Holcim

<u>Observation 3:</u> *According to the model, Holcim efficiency has failed to further improve between 2005 and 2006, or improved less than the sector average.*

Holcim's RC ratio decreased from 2005 to 2006. This means that in 2005, Holcim's performance in term of efficiency was closer to the benchmark than in 2006. This could be due to an efficiency decrease at Holcim or to an improvement of the benchmark efficiency. The efficiency of the different resources used by Holcim is shown in table 10. Efficiency and RC do not always evolve in the same direction. It seems true that Holcim's efficiency decreased between 2005 and 2006 in terms of CO_2 emissions, group employees, and water consumption, but this is not the case for SO_x emissions, and LTI. Therefore, there must be differences between the efficiency and RC ratio changes. When they do not evolve along, it means that the benchmark improved its efficiency more than Holcim did. Since efficiency variation was very small for water consumption, no further analysis was carried out for this item. The conclusion drawn at the end of this sub-section mostly applies to water as well. This sub-section looks for possible reasons to explain the figures.

	Holcim efficiency (€ per resource used)			Holcim RC in relation to the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	23%	23%	25%	0.97	0.90	0.9
Pension funding	1603%	932%	1479%	1.80	1.36	1.6
CO2 Emissions	42	61	56	0.76	0.85	0.7
NOx Emissions	21495	28203	29181	0.75	0.87	0.9
SOx Emissions	52942	85338	94922	0.76	1.06	1.0
Water consumption	30	34	34	0.78	0.94	0.8
Group Employess	65028	76326	63229	1.13	1.17	0.9
Lost Time Injuries	5279187	6904556	8007732	1.14	1.39	1.2

Table 11: Holcim efficiency rates[2]

<u>CO_2 emission</u>

According to the model, CO_2 emission efficiency and RC decreased in 2006. The financial added value per ton of CO_2 emissions decreased from 61 to 56 €, and the return to cost of CO_2 capital decreased from 0.85 to 0.76. Does this means that Holcim performed worse in 2006 than in 2005 or is there any other explanations?

A detailed analysis of the calculation helps towards a better understanding of the results. In fact, different biases influenced the results. Annex 11.3 shows details of the

[2] The figures are based on the performance data of each company, displayed in the annex 11.8. Note that their may be some differences, if doing the calculation again, because some numbers such as the value added or the LTI are rounded up.

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corrections made to eliminate these biases. First there was a currency impact. The model compares the sustainability values of the companies in euros. Holcim reports in Swiss francs and the Swiss franc depreciated between 2005 and 2006. In 2005 one euro was worth 1.56 Swiss francs and in 2006, 1.61. Holcim financial value per ton of CO_2 emitted was 95.61 CHF in 2005 and 90.56 in 2006, a 5.28 % decrease, which is less than the 8.22 % decrease in euros. Secondly, the model developed in this paper used the financial added value per emission emitted during the year to indicate the environmental performance of the companies. The reported emissions are the total amount for one year of production. The financial value used to compare the companies' performance was calculated on annual sales. Cement produced but not sold was stored in the inventories. In 2006 Holcim produced 152 million tons of cement but sold only 141 million tons, respectively 113 and 110 million tons in 2005. Thus, in 2006, efficiency was biased by the 11 million tons that were stored in the inventories. With the addition of the operating income that would have generated the production stored, there was only a 1.62% decrease of the CO_2 efficiency in 2006 (in Swiss francs). Finally, mergers and acquisitions also had an impact on the results. Financially, newly acquired firms were consolidated on the date of purchase, but social and environmental impacts were reported for a whole year of production, no matter if the subsidiary belonged to the group during the whole accounted period or not. In 2006, Holcim consolidated two Indian companies acquired during the year: ACC and Gujarat Ambuja Cement. Since 2006, India has accounted for 25% of the group production and 30% of the group employees. ACC was consolidated on January 24th 2006 and Gujarat Ambuja Cement on May 3rd. Therefore, in the comparison between the financial added value and the sustainability capital, respectively one month and four months of financial value are missing. No correction was made for this effect but it certainly negatively influenced the efficiency and RC ratio.

After the correction of the inventory and currency effect (see Annex 11.3), a decrease of 1.62% of the financial added value per ton of CO_2 emitted remains. Even if India most probably had an impact on this, there may also be other reasons. In 2006, Holcim improved its emissions per ton of CO_2 produced. Specific gross emissions improved from 0.659 to 0.653 tons of CO_2 per ton of cementitious material, the lowest in the industry (Carbon Disclosure Project, 2006), and both the operating income of the cement activities per ton of cement sold (+7.37%), and the group net income (on all activities) per ton of cement sold (+19.47%) increased. This proves that there was no diversification effect or any influences from other business activities that affected negatively the financial added value per ton of cement produced (and thus per ton of

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CO_2 emitted, since specific gross emissions improved). Hence production process efficiency improved and both the cement and the group increased their profitability. The only variables left to explain the decrease are wages and benefits, interest expenses, taxes, and community investment. A detailed analysis of the added value per ton of CO_2 emission (Annex 11.3) shows that the net income per ton of CO_2 emitted increased, but that actually all three items (interests, taxes, community spending) per emission decreased from 2005 to 2006. Based on this, it can be concluded that the remaining 1.62% decrease in CO_2 emission efficiency stemmed from payments made to external stakeholders and the integration of the Indian companies. It would also be interesting to know if Holcim effectively improved less than the benchmark, as indicated by the decrease of the RC ratio, or if this decrease was also only due to the effects mentioned above. However, this was not investigated in this study, since the data were not available to perform the required corrections on all the companies of the benchmark.

Holcim did not rank the worst in terms of CO_2 emissions but, because of other factors, the efficiency ratio and the RC ratio look worse for the year 2006 than for the year 2005.

Group employees

The previous paragraph mentioned that in 2006 there were less wages and benefits paid per ton of CO_2 emitted. Similarly, there was less financial added value per employee, partly due to the inventory and currency effects. When adjusting the return figures from those two effects, the efficiency decline passed from -17.16 % to -11.2 %. Note that here not only the cement inventories have an impact, but all manufactured and stored products. For reasons of simplicity, and since Holcim's core business is cement, no further corrections were made. Furthermore, India probably influence the return on employees even more than the return on CO_2 emissions. As mentioned earlier, financial added value included India only from January 24th for ACC and May 3rd for Gujarat Ambuja Cement. At the end of 2005 India accounted for 0% of the group employees, whereas in 2006 the figure rose to 30%. It is likely that Indian business units would be more intensive in human capital and pay lower wages and benefits than the group average, due to its level of economic development. Effectively, in 2006, Holcim India used 701 employees per ton of cement produced and Holcim Group only 581.

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SO_x emissions

Efficiency of the SO_x emissions improved in 2006 while the RC ratio decreased. This means that there was a better contribution to sustainability in 2006 than in 2005 but that the benchmark improved at a faster pace in this field. Regarding the other companies of the sector, the contribution to sustainability of the SO_x emissions also declined for Cemex and Lafarge but not for Heidelberg and CRH. In 2006, Holcim released 365 g of SO_2 per ton of cementitious material (16% better than in 2005), Heidelberg 616 g per ton of clinker (8% better) and CRH 154 g per ton of clinker (7% worse). This quick comparison proves that Holcim has not improved slower than the benchmark in terms of SO_x efficiency but only in terms of financial added value per ton of SO_x emitted. Here again, the difference may come from biases in the financial added value.

Conclusion

The preceding analysis of Holcim performance highlights additional facts concerning the practicability of the *SV approach*. It focused on the CO_2, employees and SO_x indicators. Nevertheless, it is likely that the same conclusion could apply for the LTI or the water consumption. Once again the relevance of eco- and socio-efficiency figures is limited. The results are biased by differences between financial and sustainability reporting principles, and by the composition of the financial added value. According to environmental accounting principles (WRI & WBCSD, 2004) an acquisition is integrated retrospectively in order to show the development of group entities over time. Financial accounts integrate the acquired company from the purchase date. As a result, there is a mismatch between financial revenues and environmental impacts. Moreover, whatever the sustainability objectives a firm has, its main goal will remain the maximization of profit. To achieve this goal, a firm looks for the optimal financing structure, aims to minimize the taxes it has to pay, and therefore tries to avoid excessive payments to governments and debt providers. In conclusion, it is possible that India decreased the efficiency average of the group. But it is unlikely that the group efficiency, including India, from 2005 to 2006, decreased. This is not shown by the *SV approach*. In the future, financial figures should be adjusted to include the financial added value of the newly acquired company. Finally, it can be expected that efficiency improved in 2007 since no major acquisitions were made during that year.

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4.2.4 Observation 4: HeidelbergCement better performance

Observation 4: *HeidelbergCement overtook Holcim in sustainability performance in 2006.*

In 2006, HeidelbergCement had a better RC ratio than Holcim. In order to improve the quality of the analysis, HeidelbergCement efficiency and RC ratio per resource used are detailed in table 11. It presents the same results as in table 10 but for HeidelbergCement. The German company improved the efficiency of all its sustainable capital in 2006. In addition to that, it improved at a faster rate than the sector, since the RC grew from year to year.

	HCem efficiency (€ per resource used)			HCem RC in relation to the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	16%	26%	34%	0.68	1.05	1.23
Pension funding	4985%	2726%	4262%	5.59	3.96	4.65
CO2 Emissions	33	57	68	0.59	0.80	0.91
NOx Emissions	16'450	28'276	35'525	0.58	0.87	1.10
SOx Emissions	37'013	66'143	87'663	0.53	0.82	0.94
Water consumption	20	30	36	0.53	0.82	0.88
Group Employess	35'198	60'982	70'195	0.61	0.93	1.07
Lost Time Injuries	2'751'670	3'244'999	7'408'237	0.60	0.65	1.15

Table 12: HeidelbergCement efficiency rates

HeidelbergCement made a positive contribution to sustainability in 2006 and finished second in the construction & materials sector, before Holcim. According to tables 10 and 11, Heidelberg had better RC ratios for each type of sustainable capital. The German company was also more efficient with each resource. This means that based on the model, HeidelbergCement used its capital in a way that contributed more to sustainability than Holcim did, and also created more value per unit of sustainable capital used. Section 4.2.3 demonstrated that the observation concerning Holcim's decline in performance in 2006 appeared to be biased by inventories, currency, acquisitions, and other financial effects. After correction of the inventories effect HeidelbergCement is more efficient than Holcim at the end of 2006 only in terms of capital employed, pension funding, CO_2 emissions, and NO_x emissions.

Capital employed

In 2005, Holcim acquired Aggregate Industries and made heavy investments in India (Holcim, 2006), and in that way significantly extended the capital employed (+53% in 2005 and +15% in 2006). Those investments were booked at the market value, while the previous assets were all considerably depreciated. Therefore, the capital employed increased over-proportionally to the corresponding financial added value. On the

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contrary, HeidelbergCemennt's capital employed stayed more or less stable over the three years (+5% in 2005 and -1% in 2006). This would explain why Holcim had a better RC ratio in 2004 but not in 2005 and 2006. It does not imply that it used its capital less efficiently than before, but only that it was valued differently.

Pension funding

Pension funding was used experimentally in this study. Because this information is regulated by financial reporting standards, it was easy to add it as an economic indicator. Academic research considers that there are inherent risks and negative impacts related to the underfunding of a pension plan. Nevertheless, all results and time comparisons showed that there were considerable variations from one year to the other and between the companies, without any specificity due to the sector or the prosperity of the firm, even if on a long-term basis companies should tend to reduce underfunding. As a result, the indicator appeared to be difficult to interpret and has not been used to draw any general conclusions on the sustainability of one company compared with the others.

Conclusion

As already mentioned in section 4.2.3 and above, Holcim consolidated the newly acquired Indian companies during 2006, while HeidelbergCement did not make any significant acquisitions in that period. Holcim financial added value and air emission impacts were considerably biased by this transaction. CO_2 and NO_x emissions are probably used more efficiently at Holcim than at HeidelbergCement but because of the biases it does not look so in the model. At this stage, it is difficult to conduct further calculations to see if there are any other effects influencing the results. Nevertheless, based on previous conclusion, it can be expected that Holcim will at least attain its 2005 performance in 2007.

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5 CRITICISM, POSSIBLE IMPROVEMENTS AND FIELD OF APPLICATION OF THE SV METHOD.

The model used in this study is based on the *SV approach* developed by Figge & Hahn. Although the two German researchers have proved its practicability in two studies, no evidence has been brought on the reliability and usability of the results. This paper focused on the output, and looked at whether or not the results are robust enough to form a basis for strategic, political, or investment decisions. Section 5.1 criticizes the model used and identifies what would need to be improved for it to become a useful tool. Taking into consideration the possible improvements and strengths of the model, section 5.2 broadly reviews its range of applications.

5.1 Criticism

The model described here reveals interesting facts and evidence, but also displays some weaknesses. Both strengths and weaknesses are spread over different parts of the model. First, the benchmark, the resources to be included, and the return figure play a determinant role for the quality of the results and therefore require specific attention. Second, the explanatory power of the SV and the RC ratio needs to be evaluated. Finally, the *SV approach* brings a new approach to the sustainability performance analysis that is, for the moment, not always convincing. In addition, the usability of the results also poses some problems.

5.1.1 Choice of the benchmark, the resources to be included and the return figure

<u>The benchmark</u>

The benchmark was not only used to determine the opportunity cost of the sustainability capital but also to compare Holcim's performance with that of other companies. This study used the benchmark to carry out three analyses. First it used 24 companies from 5 different sectors to see how well Holcim and some of its peers in the construction & materials sector were performing compared with companies from the chemicals, industrial metals, mining, and oil & gas sectors. Secondly, using sector averages, a comparison of those five sectors was made. According to the model assumptions, this revealed the strengths and weaknesses of the construction & materials sector. Finally, an intra-sector analysis was performed to analyze how well

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Holcim was doing compared with its construction & materials peers. In this study, the benchmark equals the average performance of a group of companies rather than the performance of a national or regional economy. There are positive and negative consequences to this.

One question raised by the choice of the benchmark is whether the selected companies were representative enough of their sectors. Did a comparison of Holcim's performance with the average performance of Cemex, CRH, HeidelbergCement and Lafarge really reveal how well Holcim performed in the construction & materials sector? Similarly, did the comparison of Holcim's performance with the average performance of the 24 selected companies reflect how well Holcim operated compared with the five sectors considered? A regional economy or a whole industry average has the advantage to be less influenced by effects such as currency, inventories, mergers and acquisitions, and also to be isolated from extreme values due to reporting errors or extraordinary events in a company. On the other side, using a group of companies as benchmark allows then more flexibility in the study. Different comparison can be performed, enabling to use the same data for the opportunity cost calculations and for the performance comparisons. In addition to that, companies also tend to publish more recent information providing a more recent analysis.

Having all sectors included in the benchmark would really highlight the specific challenges of capital intensive sectors. Nevertheless, such comparison is for now very difficult because of the lack of aggregated data; and because the wider the benchmark is, the more difficult it is to find common indicators to compare across the different sectors and companies. Finally, section 4.2.1 proved that a cross-sector comparison of efficiency was not completely meaningful. The next section focuses on the resources to be included.

<u>Resources to be included</u>

The resources included in the study determine the scope of the *triple bottom line* capital that will be assessed. As explained in chapters 2 and 3, the explanatory power of the model relies strongly on the choice of the indicators. In this paper, 8 indicators were chosen, based on different protocol, conventions and guidelines, but also on the availability of the data. Missing data were then estimated if possible. The results have nevertheless shown that there were considerable weaknesses or biases in the data. First the data availability at Holcim played an important role since it was the focus of the analysis. Therefore, the selected resources reflect rather the sustainability capital of a cement company than the average capital of the five sectors. Second, even if

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protocols, conventions, or guidelines are becoming more and more precise in their definition of what should be reported, there are still considerable differences between companies and even more, between sectors. Thus, CO_2 emissions were sometimes only reported in terms of the CO_2 equivalent of greenhouse gas emissions, sometimes as direct and indirect carbon dioxide emissions, or sometimes only as direct. Regarding lost-time injuries, it seems quite abnormal that companies such as BASF, POSCO or Shell have much better rates than their peer companies. As mentioned in chapter 3, the information needs to be comparable, understandable, relevant, and reliable (IASB Framework, 2001) otherwise the results drawn from the indicators are biased and incorrect. Current sustainability reporting appears to be far from fulfilling those criteria, and as long as there are no better convergences between companies in term of sustainability reporting, no consistent comparison will be possible. Only similar companies active in similar businesses and reporting according to the same standards or protocol are today in the position of being compared, and even then, the analysis of the cement industries has shown it, many difficulties remain.

In their study, Figge & Hahn mentioned that one strength of their method is that it is based on publicly available information. This is true in theory, but in practice the publicly available information is still very poor. Szekeily & Knirsch (2005) examined the metrics used by twenty German companies to measure sustainability. The study confirmed that if economic and sometimes environmental performance can be well evaluated, social performance and intangible assets remain hard to measure. Other reports such as the *KPMG International Survey of Corporate Responsibility Reporting* (2005), or *the UNCTAD review on the Reporting Status of Corporate Responsibility Indicators* (2006) showed that the availability of information is still a main issue when comparing the sustainability performance of different firms. Furthermore, the indicators used in the *SV approach* are all quantitative indicators. Qualitative indicators such as the existence of a quality and environment management system, the commitment of the company to society, supply chain management, or customer relationship management are not considered at all, thus leaving out of the model a considerable part of the work achieved by some companies to enhance their contribution to sustainability. Finally, the data were only collected and assessed over three periods. It is quite a short lap of time to highlight general trends in terms of sustainability. During this period, some sectors had exceptional economic growth, thanks to high pricing (oil & gas, steel), and other not.

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The return figure

The return figure in this study is the financial added value, including community investment. A well-performing company generates a lot of financial added value and uses few resources. But the company that generates a lot of financial added value may not be the one that brings the most benefits to society. Added value has been widely discussed in the literature, and the return figures to include in the SV approach can take many different forms, influencing the final results. The problem of assessing non-financial value will be discussed in the next sub-section, along with the explanatory power of the study.

Added value is a concept developed to measure the output of a company or its production value. It is the valued added by an entity to the raw materials and outside purchases (Bao & Bao, 1989, p. 701). As mentioned in section 3.3, there exists a gross added value and a net added value. The former consists of sales minus the brought-in materials and services; and the latter is gross added value minus depreciation. This study included depreciation in the added value. However, depreciation is a provision and could also be considered as retained earnings (Purdy, 1983, as cited in Bao & Bao, 1989). Depreciations are also tributary to subjective decisions by the management. Not considering them avoids biases due to management's judgment. Based on the added value concept described here, Figge & Hahn (2007) extended the possible return figures. Added value could be: the net income from a shareholder point of view, the whole revenue from the viewpoint of society, including suppliers, or any kind of figure in the middle depending on the stakeholders concerned.

This model used the net added value enhanced by community investments. It presents two main weaknesses. First, as mentioned in section 4.2, including tax payments and interest expenses into the model integrates figures that the firm will try to minimize. Second, community investments have not been very reliable in this model. Community investment regroups all kinds of payments and programs undertaken by the firm for the community. It can cover sponsorship, free goods or services, grants etc. The problem is that it does not differentiate the quality of the investment. Grants and sponsorship rarely improve the development of a group of people. Community programs aiming to provide houses for everybody, to enhance education levels, or to improve agricultural efficiency have a much higher impact than sponsorship. For this reason, the community investments of different firms can be very heterogeneous and do not always contribute to sustainability in the same way. Moreover, community investment programs usually cover different periods and take a certain time to set up.

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Section 4.2 also showed that often business activities grow faster than community investments, since they are not linked. In the end, as with taxes and interest expenses, community investments may decrease the financial added value per sustainability impact over time.

5.1.2 The explanatory power of the results

The rationale of the *SV approach* is to evaluate a firm's contribution to sustainability, based on its efficiency and effectiveness. Performance is assessed by two indicators: the SV and the RC ratio. The former shows how much more value the firm can generate when using the same resources as the benchmark. The latter shows the relation between the value generated by the firm and the benchmark performance. This sub-section discusses how those two indicators assess the efficiency and effectiveness of the firm and to what extent they reflect the sustainability contribution of a firm.

In the model, a firm that is more efficient than the benchmark generates more value with the same resources and therefore has a positive SV and a RC above one. Both indicate whether the firm has been more efficient than the benchmark. The SV gives in absolute term the gains for society resulting from the efficiency of the firm, while the RC gives it in relative terms. Eco- and socio-efficiency are recognized indicators that encourage a firm to improve its sustainability while, in parallel, ensuring economic benefits (WBCSD, 2006). The WBCSD gives the following definition for eco-efficiency:

> *"Eco-efficiency is achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the Earth's estimated carrying capacity." (WBCSD, 2006)*

The definition above speaks of the *delivery of goods and services that satisfy human needs*. The problem when comparing the efficiency of, for example, POSCO and Holcim, is that it does not take into consideration the human needs for cement and steel. Only the financial added value is considered. Concrete is the most used material in the world (Gartner 2004, p. 1489). If cement companies are inefficient, then it could be asked if cement is correctly priced. If cement prices were to increase, in certain cases, cement would be replaced by substitutes fulfilling the same properties but being cheaper. On the other side, an increase in the prices would directly affect the end consumer, deteriorating its purchasing power. Since the return figure used in this study

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does not include the value provided to the consumer, an increase in prices would have positive effect on the efficiency. However, it is still not sure that society would be better off. The *SV approach* was used to rank companies according to their sustainability performance. But it only considers financial added value and not the overall benefits that the firm could provide to society. Thus the comparison would makes sense when the non-financial value of the compared companies is similar, which is usually the case inside a sector. Finally, even if it can be useful for intra-sector analyses, section 4.2 showed that many factors could bias the result and give an image that is very different from reality.

Inciting companies to improve their eco- and socio-efficiency is important. Encouraging them to improve their effectiveness is even better. Even if, year after year, a firm generates more value per unit of resource used, the company may not become more sustainable if it does not converge to the threshold, i.e. to the tolerated impacts. Environmentally, the threshold is the use of resources that is below the regeneration rate of those resources. Socially, it is when a company improves “the quality of life of the workforce and their families as well as of the local community and society at large” (Young & Tilley 2006, p. 405) while behaving ethically and contributing to economic development. This is, however, much more difficult to measure. It could be for example, social impacts judged reasonable for a community. With the SV figure, effectiveness is not automatically addressed, and if so, often in a partial way. To improve effectiveness, abundant uses of a resource should be penalized. Yet, the SV penalizes only abundant uses that generate less added value per unit of output than the benchmark. Let us take the following example: steel production worldwide was 1’244 million tons in 2006 (International Iron and Steel Institute, 2007). In comparison, global cement production reached 2’611 millions tons in the same year (Global Cement Report, 2007). Thus, human society used almost two tons of cement per ton of steel to satisfy its needs. As mentioned before, producing one ton of cement grossly emits 0.7 tons of CO_2 while producing one ton of steel emits about 2.1 tons of CO_2. As a result, to satisfy today’s society the cement industry has to emit 1’830 million tons of CO_2 while the steel industry needs to emit 2’612 million tons of CO_2 and is therefore less effective than the cement industry. Nevertheless, steel companies have all performed better than the cement ones because they generate a product with more added value. Here again, the problem of the real contribution to society is raised. Industries polluting a lot but delivering a lot of financial value will be considered as more effective than industries, like the cement one, polluting considerably but delivering little financial value. The model does not directly reflect any improvement in

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effectiveness but it can encourage and highlight the convergence of a firm's activities toward a threshold. In the NeW and Advance studies (Figge & Hahn, 2006, 2007), the 2010 goals to achieve in term of sustainability provide a short term threshold. Companies that use resources at an efficiency level corresponding at least to the goals are considered to be effective. However, separation of economic value from the social and environmental impacts is what is needed in order to really evaluate the effective sustainability of a company, and this not reflected by the *SV approach.*

To conclude, the *SV approach* delivered results that always linked sustainability with financial value. In terms of efficiency assessment, the method has interesting potential. First, it rewards companies that are very eco-, and socio-efficient, and penalizes the others. Second, when used for comparisons over time, it shows the improvements of the firm. But it is now also clear that eco- and socio-efficiency are only necessary conditions for sustainability improvements and not sufficient. In order to really increase the contribution to sustainability, eco-, and socio-effectiveness also need to be considered.

For Holcim, it confirmed that the company has performed better than its competitors in the sector and also that it has improved from year to year. For the cement industry, it highlighted where it was weaker than other sectors. Further attention should be paid to these factors in order to determine whether the cement industry really does perform worse in those areas or if it is again due to some imperfections of the model. Overall, the model proved to constitute an interesting basis for understanding the threats facing the cement industry, or the challenges confronting Holcim regarding sustainability.

5.2 The *SV approach* in practice

More and more people and organizations include sustainability in their decision making process, strategically, politically or when investing. Beneficiaries from such a model could be the companies themselves, rating institutions and investors, governments, and international and non-governmental organizations.

5.2.1 The companies

For companies the *SV approach* could provide three things. First, the *SV approach* calculates a unique figure that could simplify communication with the public in terms of sustainability. In its annual report 2007, BMW was more than happy to quote the results of the NeW study and to write that in 2004 BMW used its resources five times more efficiently than the German economies (BMW, 2007, p. 13). However, as the

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preceding analysis has shown, such results remain very subjective and may do more harm than good for companies such as Holcim since they do not consider all the efforts made by the company. Secondly, and more interesting, such a method can also be used to situate the company *vis-à-vis* its peers, and establish an evaluation of the company's performance in terms of sustainability. Areas where the company does not perform well are the ones that could, in the future, tarnish the company image or, possibly, increase its costs if society decided to penalize the impacts. Such an analysis would require a good benchmark in order to obtain a fair picture of the sector performance. In the cement industries, such information may be soon available, for cement activities only, with the publication of the Cement Sustainability Initiative Progress Report by the WBCSD. Note here that it is questionable whether or not an aggregated indicator is more valuable. Nowadays, companies already have data to compare the different fields of sustainability. In the cement industries, emission figures, lost-time injury frequency rates, or water consumption are all well established indicators that already inform the management if the company is doing better than its peers. Finally, the *SV approach* could also be used to assess the sustainability performance of potential acquisition targets. Financial models can relatively well evaluate the acquisition price of a firm. However, this does not take into account the sustainability of the target. Running such a model by using the acquirer as benchmark and the target company as the one to assess, could indicate whether the target is in line with the sustainability policy of the group. In the acquisitions of Ambuja cement and of ACC, such a model could have been used to ascertain whether the sustainability of the targets would be a cost or a benefit for Holcim. In the end it could be a component of the price.

5.2.2 Sustainability rating institutions and investors

In his articles about the role of corporate sustainability rating institutions, Schäfer (2005) discussed the importance that sustainability ratings have acquired since the 90's. He described the rating institution as the link between companies and stakeholders for *triple bottom line*-related information. According to the paper, today most of the rating institutions collect sustainability information in order to establish a rating or an overall assessment that will give capital markets and other stakeholders the opportunity to select companies that are more sustainable than others. For these reasons, the present model may also be an interesting tool for such institutions. Below, a quick comparison with the Holcim assessment made by the DJSI presents the main

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differences between the model developed in this paper and the method used by the SAM group.

The SAM group also uses a benchmarking method to do their Corporate *Sustainability Assessment*. The following paragraphs describe the method used, referring to the reports made to Holcim in 2007 and based on information published on their website. The *Corporate Sustainability Assessment* was performed for all eligible DJSI companies. Like the *SV approach*, it looks at the *triple bottom line* of each company compared with the sector or the industry. However, the indicators are very different. There are no indicators that are only quantitative. The institution looks at the management systems and strategies of the assessed company in order to attribute a score. Thus, the economic dimension is evaluated by criteria such as corporate governance or customer relationship management; the environmental dimension by the environment policy and management system, or the recycling strategy; the social dimension by labor practice indicators, or stakeholder engagement. Information sources are questionnaires sent to the companies, companies' own documentation, media releases, and personal contacts with companies. Each criterion is weighted differently based on its importance regarding sustainability. As a result, the top companies of the assessment are selected for the Dow Jones Sustainability Index. For example, the Dow Jones Sustainability World Index includes 10% out of the 2500 assessed companies worldwide, supposedly representing the 250 most sustainable companies.

The main difference with the *SV approach* is in the scope of the evaluation. The *Corporate Sustainability Assessment* considers mainly the commitment to sustainability of the firm, while the *SV approach* looks at the current situation of a company. The two approaches are different but not incompatible. A future-oriented approach was already included in the NeW study and ADVANCE project when the benchmark used was the 2010 objectives of the economy. It would be possible to compare a 2010 benchmark with what the firm expected to achieve in 2010. However, this approach would leave a fair amount of uncertainty and doubt as to the reliability of the forecasts. Hence, assessing the firm's commitment seems more adapted to reality, at least for now. But a comparison of both models can reveal interesting facts. A company performing well in the *SV approach* but not in the DJSI is exposed to the risk of not performing well in the future since it is not as committed to sustainability as its peers. On the contrary, a company performing badly in terms of SV, but being well-ranked in the DJSI has a brighter outlook for the future and stands a good chance of improving its value.

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The *SV approach* can be an interesting tool for a rating company to monitor progress and the relationship between the commitment of the firm and its current performance. For the investors in general, it can also be instructive to ascertain how a firm is currently performing in term of sustainability. “Green investors” may only want companies that have positive contributions to sustainability. Others may want to speculate on better growth potential for the companies that have a bad performance today, but good commitment.

5.2.3 Governments

Governments, as policy makers, are becoming more and more involved in sustainability. In January 2008, the European Union launched a new package of measures to fight climate change. Social issues, even if less of a hot topic today in politics, are also always addressed and many countries try to force companies to work according to the principles of human rights and business ethics. Companies pay the external costs of their activities through programs set up by governments, such as the European Union Emissions Trading Scheme. The Review of EU Emissions Trading Scheme (EC, 2005) gives encouraging signs of progress. Companies seem to take the issue very seriously. For 50% of the companies included in the review, emission issues play a key role in their long-term decision making. Current problems discussed in the review concern the schedule of emissions allowance and the method used to decide the amount. An allowance is the amount of emissions a company is allocated. In other words, during a specific trading period, it states the quantity of emissions a company is allowed to produce. The difference between this and effective production is traded. The Review of EU ETS (EC, 2005) presents two systems of allocation: benchmarking and auctioning. Even though the last directive of the European Parliament and of the Council on the trading scheme (CEC, 2008, p. 22) states that auctioning is preferred to benchmarking in deciding the emission allowances to companies (starting from 2013), the model developed here would nevertheless have presented an interesting tool for benchmarking. The EU ETS, like the model, applies to five sectors (Power Generation, Cement, Steel, Pulp & Paper and Refineries) and requires sector as well as country correction factors in order to ensure a fair allocation. The model developed in this paper, adjusted for Europe and the desired industries, and used with reliable data could have provided a good complementary tool for decision-makers. Even in areas other than CO_2 emissions, the model could present a good opportunity for a government to assess corporate external costs and help to design policies to improve the sustainability of domestic companies. However, chapter

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4 has clearly showed that there were some difficulties in doing so. The point of view of government is extended to all companies of a region, which, from the *SV approach* standpoint is, for the moment, not so reliable.

5.2.4 International organizations and NGOs

Many international organizations and NGOs deal with sustainability issues. International organizations like the UN, the OECD or the WBCSD but also NGOs such as Social Accountability International, Transparency International or the WWF are all committed to foster improvement in corporate sustainability. Some (usually international organizations) address the whole *triple bottom line* and others only specific areas of sustainability such as climate change, human rights or corruption and bribery. The role of those organizations is usually to examine the criteria relevant for a sustainability analysis (Schäfer 2005). It is important for them to know where society stands in terms of sustainability, and what the remaining challenges are. The *SV approach* can be a valuable tool to highlight those issues, but only when it is based on reliable and consistent data. At the present time, it seems that international organizations and NGO's have more benefits to give to the method by developing better standards and more reliable sets of indicators, than benefits to withdraw from the use of such a tool. Nevertheless, they can have a strong impact on the explanatory power of the method and they have an important role to play.

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6 CONCLUSION

This thesis was written to respond to two objectives:

1. *To assess Holcim, using the SV approach, in order to better understand its challenges in terms of sustainable development, and to identify its strengths and weaknesses in this field compared with, among others, the construction & materials sector.*
2. *To assess the SV approach itself and the consistency and reliability of its results, in order to determine possible applications for the method.*

Chapter four presented four observations drawn from the results:

- The construction & materials sector, and specifically the cement sector, contribute less to sustainability;
- CRH performs much better than the cement companies;
- Holcim failed to improve its efficiency between 2005 and 2006;
- HeidelbergCement has overtaken Holcim in the sustainability performance in 2006.

This information formed a basis for evaluating the quality of the output. Analyzed one by one and compared with other sources of information, they showed the strengths and weaknesses of the *SV approach*.

Cross-sector analyses are difficult to conduct and to interpret. Finding the right set of indicators for assessing companies across different sectors is not easy. The different profitability and capital structures between sectors significantly affect the efficiency of the companies, and their performance in the model. Capital intensive sectors with products of low value tend to perform more poorly than others. The relevance of the efficiency concept in comparing companies across sectors is therefore quite limited. Comparing the results over time can make more sense. Furthermore, the model has difficulty in considering the effective contribution of companies to sustainability. Because it never separates economic value from the environmental and social impacts, information on social and environmental absolute impacts of companies is not fully reflected by the model. It only gives information on the convergence of a company to a defined threshold, the benchmark, but not on effective use of *triple bottom line* capital.

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The intra-sector analysis appeared to be useful for an in-depth investigation of the output and its explanatory power. It revealed weaknesses in data reporting and in the mismatch between financial and sustainability data. Because of biased figures due to acquisitions, inventories, or currency effects, Holcim was less efficient in 2006 than in 2005 and was outperformed by HeidelbergCement. However, the output appeared to be incomplete because of the biases. As a result, the *SV approach* is effectively practicable but many corrections are needed in order to have comparable data. In addition to that, publicly available information often does not provide all the necessary figures. This considerably limits the use of the method.

Sustainability reporting is relatively new. Companies have now more or less assimilated the concept. Today more than 75% of large companies include at least a corporate sustainability section in their annual reports (UNCTAD, 2006, p.19). However, significant convergence is still needed in order to improve the comparability of the reports. Improvements in understandability, relevance, and reliability should also be considered. The multiplicity of issues addressed across industries, and the diversity of the stakeholders concerned considerably complicate the task. Cooperation between the different standard setters and the business world is the key to progress in this field. Nevertheless, current trends are encouraging, and major improvements are to be expected in the future.

The study positively confirms the practicability of the method, however with a reserve regarding current availability of the data. It also suggests different fields of application for companies, rating institutions, and investors, governments, and international and non-governmental organizations. It seems that the *SV approach* has more potential to bring to companies and rating institutions for company specific analyses, as a tool for comparison over time, or within peer groups. In mergers and acquisitions, the tool could eventually be used to assess divergences in the field of sustainability between the parties concerned. The *SV approach* also seems to be a consistent tool for evaluating current economic, social, and environmental efficiency of a firm. The flexibility of the method and the possibility of adjusting it to specific goals, allows the user to decide which impacts to consider. This augurs an interesting potential for the method.

As the world moves toward an increasing scarcity of resources and growing social as well as environmental challenges, sustainability issues will be given more and more emphasis. Nevertheless, society will still need cement, chemicals, metals and oil for a long time to come. Those industries will remain as long as demand remains. On the other hand, it will not be possible to solve the challenges mentioned above and satisfy

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all the demand if no changes happen. And this is exactly where the strength of this study lies. The fact that the cement industry performs so badly should underline the risk of growing political pressure to improve the eco- and socio-efficiency of the sector. But this should be seen more as an opportunity than a threat for cement companies. The company that manages to raise its efficiency to a (more) sustainable level will be rewarded by society, just as the company lagging behind will be put under pressure to follow that progress. Companies have to consider there global contributions to society when orientating their strategies. Governmental latest decisions show that they will be tolerant with industries intensive in capital until 2020 (CEC, 2008, p. 25). In the long term, companies will have to find alternatives to improve their eco-, and socio effectiveness in addition to the efficiency.

Finally, the study also raises the complexity and difficulty of addressing sustainability. The necessity of lowering environmental and social impacts while sustaining economic growth complicates the role of each party concerned. Companies, governments, consumers and communities, all have to work together if they want to ensure the right for *future generations to meet their own needs*.

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9 BIBLIOGRAPHY

Ackermann M. & Soiron R. (2005), *Chairman and CEO statement*, Holcim Publication, retrieved April 6, 2008 from http://www.holcim.com/CORP/EN/id/52029/mod/gnm50/page/editorial.html

Anthony R & Govindarajan V. (2003), Management Control Systems, McGraw-Hill Companies, 11th edition

Atkinson G. (2000), *Measuring corporate sustainability*, Journal of Environmental Planning and Management, 43, 235-252

Bao B-H & Bao D-H (1989), *An Empirical Investigation of the Association between Productivity and Firm Value*, Journal of Business Finance & Accounting.

Berkhout P. H. G., Muskens J. C., & Velthuijsen J. W. , 2000, *Defining the rebound effect*, Energy Policy, 28, 425-432

Brundtland G. H. (1987), *Our Common Future*, World Commission on Environment and Development, Brussels

BMW (2007), *Sustainable Value Report 2007/2008*, Munich

Carbon Disclosure Project (2007), Answers by Holcim to the Carbon Disclosure Project Greenhouse Gas Emissions Questionnaire for the year 2006, retrieved 16 March 2008 from http://www.cdproject.net/

Carroll T. & Niehaus J. (1998), Pension Plan Funding and Corporate Debt Ratings, Journal of Risk and Insurance, 65 (3), 427-441

Cemex (2007a), *Annual Report 2006*, San Pedro Garza García

Cemex (2007b), 2006 *Sustainable Development Report*, San Pedro Garza García,

European Chemical Industry Council (CEFIC) (2006), *Responsible Care Reporting Guidelines 2006*, Brussels

Commission of the European Communities (CEC), (2008), *Directive of the European Parliament and of the Council on the trading scheme*, Brussels

Dow Jones Indexes & FTSE (2004), *Industry Classification Benchmark, http://www.icbenchmark.com/*

Dyllick T. & Hockerts K. (2004), *Beyond the business case for corporate sustainability*, Business Strategy and the Environment, 11, 130-141

Copyright © 2008 University of St. Gallen / Holcim Group Support Ltd.

Elkington J. (1997), *Cannibals With Forks: the Triple Bottom Line of 21st Century Business*. Capstonse: Oxford

Environment Canada (2008), *Sulfur Oxides*, retrieved April 5, 2008 http://www.ec.gc.ca/cleanair-airpur/Pollutants/Criteria_Air_Contaminants_and_ Related_Pollutants/Sulphur_Oxides_(SOx)-WSBBB2123F-1_En.htm

European Confederation of Iron and Steel Industries (EUROFER) (2004), *Position Papers 2004*, paper retrieved April 9, 2008 from http://www.eurofer.org/positionpaper/compet/competitiveness_et.htm#calleudecmakers,

European Commission (EC) Directorate General for Environment (2005), *Review of EU Emissions Trading Scheme*

European Environment Agency, *Acidification Introduction*, April 5, 2008 http://www.eea.europa.eu/themes/acidification

Figge F. & Hahn T. (2004), *Sustainable Value Added – measuring corporate contributions to sustainability beyond eco-efficiency*, Ecological Economics, 48, 173-187

Figge F. & Hahn T. (2006a), *The ADVANCE Guide to Sustainable Value Calculations*, ADVANCE project

Figge F. & Hahn T. (2006b), *Sustainable Value of European Industry*, ADVANCE project

Figge F. & Hahn T. (2007), *Nachhaltig erfolgreich Wirtschaften*, NeW project

Franzoni F. & Marin J. (2006), *Pension Plan Funding and Stock Market Efficiency*, the Journal of Finance, 61 (2), 921-956

Gartner E. (2004), *industrially interesting approaches to "low-CO2" cements*, Cement and Concrete Research, 34 (9), 1489-1498

Global Cement report (2007), *7th Edidtion*, Tradeship Publication, Surrey

Global Reporting Initiative (2006), *Sustainability Reporting Guidelines*, Amsterdam

Hart S. L. & Milstein M. B. (2003), *Creating sustainable value*, Academy of Management Executive, 17 (2), 56-67

Hendriks C. A., Worell E., de Jager D., Blok K., & Riemer P. (1998), Emission Reduction of Greenhouse Gases from the Cement Industry, Proceedings of

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the 4th International Conference on Greenhouse Gas Control Technologies, Interlaken, Austria, Aug. 30–Sept. 2, IEA GHG R&D Programme, UK

HeidelbergCement (2007a), Annual report 2006, Heidelberg

HeidelbergCement (2007b), *Today for tomorrow – success and goals for sustainability*, Heidelberg

Holcim (2006), *Holcim Corporate Development Report 2005*, Zürich

Holcim (2007a), Annual report 2006, Zürich

Holcim (2007b), *Holcim Sustainable Development website*, retrieved at different periods during the research. http://www.holcim.com/CORP/EN/id/1610644016/mod/gnm50/page/channel.html

Ippolito R. (1985), *The Economic Function of Underfunded Pension Plans*, Jounral of Law & Economics, 28, 611-652

International Accounting Standard Board (IASB) (2001), *Framework for the Preparation and Presentation of Financial Statements*

International Iron and Steel Institute (2007), *World crude steel production, 1950 to 2006*, retrieved April 20, 2008 from http://www.worldsteel.org/?action=storypages&id=193

Jeurissen R., 2000, *Book Review*, Journal of Business Ethics, 23, 229-231

Josa A., Aguado A., Heino A., Byars E., Cardim A., (2004) *Comparative analysis of available life cycle inventories of cement in the EU*, Cement & Concrete Research, 34, 1313-1320

KPMG (2005), KPMG *International Survez of Corporate Responsabilitz Reporting 2005,* Amsterdam

Lafarge (2007a), Annual report 2006, Paris

Lafarge (2007b), *Sustainability Report 2006*, Paris

Purdy D.F, (1983), *The Enterprise Theory: An Extension,* .Journal of Business Finance and Accounting, Winter83, 531-541.

Pellens B., Fülbier R. U., & Gassen J. (2006): *Internationale Rechnungslegung*, Schäffer-Poeschel, 6th Edition, Stuttgart

Riahi-Belkaoui A. (1999), *Productivity, Profitability, and Firm Value*, Journal of International Financial Management and Accounting, 10 (3), 188-201

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Schäfer H. (2005), *International Corporate Social Responsibility Rating Systems*, Journal of Corporate Citizenship, 20, 107-120

Szekeily F. & Knirsch M. (2005), *Responsible Leadership and Corporate Social Responsibility: Metrics for Sustainable Performance*, European Management Journal, 23 (6), 628-647

United Nations Conference on Trade and Development (2006), *2006 Review of the reporting status of corporate responsibility indicators*, Geneva

United Nations Statistic Division (2005), Emissions of NOx, retrived April 5, 2008 from http://unstats.un.org/unsd/environment/air_NOx _emissions.htm

E. Worell, L. Price, N. Martin, C. Hendriks, & L. Ozawa Meida, 2001, *Carbon Dioxide Emission from the Global Cement Industry*, Annual Review of Energy and Environment, 26, 303-329

World Business Council for Sustainable Development (2002), *Toward a sustainable cement industry*, Geneva

World Business Council for Sustainable Development (2005a), *Guidelines for Emissions Monitoring and Reporting in the Cement Industry*, Geneva

World Business Council for Sustainable Development (2005b), *Safety in the cement industry: Guidelines for measuring and reporting*, Geneva

World Business Council for Sustainable Development (2006), *Eco efficiency learning module*, Geneva

World Business Council for Sustainable Development (2007), Making Cement Sustainable: Carbon and other Emissions, World Cement, May 2007, Geneva

World Resources Institute & World Business Council for Sustainable Development 2004, The Greenhouse Gas Protocol, Geneva – Wahsington

Young W. and Tilley F. (2006), Can Business Move Beyond Efficiency? The Shift Toward Effectiveness and Equity in the Corporate Sustainability Debate, Business Strategy and the Environment, 15, 402-415

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10 LIST OF PERSONNAL COMMUNICATIONS

Stefanie Koch	Manager of Corporate Social Responsibility, Holcim Group Support Ltd., CSR Department	
	15.11.2007	Personal meeting
	27.11.2007	Personal meeting
	11.03.2008	Personal meeting
Boris Ricken	Consultant, Holcim Group Support Ltd., Corporate Strategy & Risk Management	
	22.11.2007	Personal meeting
	28.11.2007	Personal meeting with Stefan Huber & Philippe Rey
	08.05.2008	Personal meeting with Stefan Huber & Philippe Rey
Stefan Huber	Head Business Planning, Holcim Group Support Ltd., Corporate Strategy & Risk Management	
Philippe Rey	Consultant, Holcim Group Support Ltd., Corporate Strategy & Risk Management	
Rüdiger Stenger	Head of Environmental technical procedures and studies, Holcim Group Support Ltd., Corporate Industrial Ecology	
	17.03.2008	Email communication
Bruno Vanderborght	Head of Environmental Strategy, Holcim Group Support Ltd., Corporate Industrial Ecology	
	01.04.2008	Personal meeting with Lorenz Koch
Lorenz Koch	CO_2 consultant, Holcim Group Support Ltd., Corporate Industrial Ecology	
	04.04.2008	Personal meeting
Adrienne Williams	Senior Consultant, Holcim Group Support Ltd., Corporate Industrial Ecology	
	08.04.2008	Personal meeting with Flooris van der Walt

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Flooris van der Walt	HR Business Support, Holcim Group Support Ltd., Corporate Human Resources Management
Bengt Steinbrecher	Assistant Head CCO**,** Holcim Group Support Ltd, Corporate Controlling
	08.04.2008 Email communication

All the meetings and email communication helped a lot in the establishment of the key challenges for Holcim in terms of sustainability and in the validations and interpretations of the results.

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11 ANNEX

11.1 Companies selected for the benchmark

Company	Country	Sector	DJSI Award	Fortune 500 2006 Ranking
Akzo Nobel	Netherlands	Chemicals	Sector Leader 07	418
Alcan	Canada	Industrial Metals	Sector Leader 04-05	313
Alcoa	United States	Industrial Metals		225
Anglo American	United Kingdom	Mining		196
Arcelor	Europe	Industrial Metals		137
BASF	Germany	Chemicals		94
Bayer	Germany	Chemicals		163
BHP Biliton	Australia	Mining	Sector Leader 05-06-07	195
BP	United Kingdom	Oil & Gas Producers		4
Cemex	Mexico	Construction & Materials		451
CRH	United Kingdom	Construction & Materials		361
DSM NV	Netherlands	Chemicals	Sector Leader 04-05-06	N/L
E.I Dupont De Nemours	United States	Chemicals		205
Encana	Canada	Oil & Gas Producers		396
Exxon Mobil	United States	Oil & Gas Producers		1
HeidelbergCement AG	Germany	Construction & Materials		N/L
Holcim	Switzerland	Construction & Materials	Sector Leader 05-06-07	458
Lafarge	France	Construction & Materials		325
Norsk Hydro	Norway	Industrial Metals	Sector Leader 06-07	222
POSCO	South Korea	Industrial Metals		236
Rio Tinto Group	Australia	Mining		310

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11.2 Data availability

	Net income	Taxes	Financial Expenses	Employees Costs (Mio)	Value to stakeholders (Mio)	Community Investment (Mio EUR)	Value	Capital employed	Pension funding	CO2 Emissions	VOC ('000 T)	NOx Emissions	SOx Emissions	Non reusable waste ('000 T)	Water consumption	Group Employess	Lost Time Injuries
Data availability 2004	100%	100%	100%	83%	100%	50%	100%	100%	88%	83%	46%	75%	75%	54%	54%	100%	88%
Data availability 2005	100%	100%	100%	83%	100%	58%	100%	100%	96%	88%	46%	79%	79%	63%	67%	100%	96%
Data availability 2006	100%	100%	100%	88%	100%	71%	100%	100%	96%	88%	46%	83%	88%	54%	63%	100%	92%
Data availability Chemicals 2004	100%	100%	100%	60%	100%	40%	100%	100%	100%	80%	80%	80%	60%	80%	40%	100%	80%
Data availability Chemicals 2005	100%	100%	100%	60%	100%	40%	100%	100%	100%	100%	80%	80%	80%	100%	40%	100%	100%
Data availability Chemicals 2006	100%	100%	100%	60%	100%	60%	100%	100%	100%	100%	80%	80%	80%	80%	40%	100%	80%
Data availability Construction & Materials 2004	100%	100%	100%	80%	100%	20%	100%	100%	100%	100%	20%	60%	60%	20%	20%	100%	80%
Data availability Construction & Materials 2005	100%	100%	100%	80%	100%	20%	100%	100%	100%	100%	20%	80%	80%	20%	60%	100%	100%
Data availability Construction & Materials 2006	100%	100%	100%	100%	100%	40%	100%	100%	100%	100%	20%	100%	100%	20%	40%	100%	100%
Data availability Industrial Metals 2004	100%	100%	100%	80%	100%	60%	100%	100%	80%	80%	20%	60%	100%	80%	80%	100%	80%
Data availability Industrial Metals 2005	100%	100%	100%	80%	100%	60%	100%	100%	80%	80%	20%	60%	80%	80%	80%	100%	80%
Data availability Industrial Metals 2006	100%	100%	100%	80%	100%	80%	100%	100%	80%	80%	20%	60%	100%	60%	80%	100%	80%
Data availability Mining 2004	100%	100%	100%	100%	100%	75%	100%	100%	100%	100%	25%	75%	75%	50%	100%	100%	100%
Data availability Mining 2005	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	25%	75%	75%	75%	100%	100%	100%
Data availability Mining 2006	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	25%	75%	75%	75%	100%	100%	100%
Data availability Oil & Gas Producers 2004	100%	100%	100%	100%	100%	60%	100%	100%	60%	60%	80%	100%	80%	40%	40%	100%	100%
Data availability Oil & Gas Producers 2005	100%	100%	100%	100%	100%	80%	100%	100%	100%	60%	80%	100%	80%	40%	60%	100%	100%
Data availability Oil & Gas Producers 2006	100%	100%	100%	100%	100%	80%	100%	100%	100%	60%	80%	100%	80%	40%	60%	100%	100%

11.3 Holcim currency and inventory effects on efficiency; CO_2 emissions and employees' efficiency analysis

Holcim efficiency (€ per resource used)							Variation		
	2005 std.	2006 std.	2005 inv. adj.	2006 inv. adj.	2005 CHF	2006 CHF	Δ 05-06 std	Δ 05-06 inv.	Δ 05-06 CHF
Capital employed	0.23	0.25	23.1%	26.2%	23.0%	26.2%	10.03%	13.77%	14.28%
Pension funding	9.32	14.79	944%	1549%	940%	1549%	58.66%	64.05%	64.79%
CO2 Emissions	61.29	56.25	62.07	58.90	96.39	94.83	-8.22%	-5.10%	-1.62%
NOx Emissions ('000 €)	28.20	29.18	28.56	30.56	44.36	49.20	3.47%	6.98%	10.91%
SOx Emissions ('000 €)	85.34	94.92	86.43	99.40	134.22	160.03	11.23%	15.01%	19.23%
Water consumption	34.30	33.82	34.74	35.41	53.95	57.01	-1.40%	1.95%	5.69%
Group Employees (Mio €)	0.08	0.06	0.08	0.07	0.12	0.11	-17.16%	-14.34%	-11.20%
Lost-time injuries (Mio €)	6.90	8.01	6.99	8.39	10.86	13.50	15.98%	19.92%	24.32%

	Net income + add earning from inventory	Tax	Interest	Employee	Community Investment	Value added adjusted from inventory effect	Value added not adjusted
Holcim efficiency per ton of CO2 emitted							
Holcim 2005 (CHF)	25.20	11.60	11.76	47.84	0.43	96.39	95.61
Holcim 2006 (CHF)	31.52	10.80	9.64	42.52	0.36	94.83	90.56
Holcim 2005 (€)	16.15	7.43	7.54	30.67	0.28	62.07	61.29
Holcim 2006 (€)	19.58	6.71	5.99	26.41	0.22	58.90	56.25
Holcim improvement (CHF)	25.06%	-6.84%	-18.01%	-11.13%	-16.69%	-1.62%	-5.28%
Holcim improvement (€)	21.17%	-9.74%	-20.55%	-13.89%	-19.28%	-5.10%	-8.22%
Holcim efficiency per employee							
Holcim 2005 (CHF)	31385	14440	14641	59582	539	120048	119068
Holcim 2006 (CHF)	35427	12142	10835	47791	405	106600	101799
Holcim 2005 (€)	20119	9257	9385	38193	346	77300	76326
Holcim 2006 (€)	22004	7542	6730	29684	252	66211	63229
Holcim improvement (CHF)	12.88%	-15.92%	-25.99%	-19.79%	-24.80%	-11.20%	-14.50%
Holcim improvement (€)	9.37%	-18.53%	-28.29%	-22.28%	-27.14%	-14.34%	-17.16%

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11.4 Benchmark efficiency, per sector and for the five sectors

	Value	Capital employed	Pension funding	CO2 Emissions	NOx Emissions	SOx Emissions	Water consumption	Group Employees	Lost Time Injuries
All Sector efficiency (€ per unit of ressource used) 2004	1	30%	575%	208	112237	87904	29	137370	24657165
All Sector efficiency (€ per unit of ressource used) 2005	1	36%	771%	292	140652	122582	40	193325	32676059
All Sector efficiency (€ per unit of ressource used) 2006	1	36%	713%	283	152224	137611	42	186580	34759720
Chemicals efficiency (€ per unit of ressource used) 2004	1	33%	287%	520	538089	1324809	9	91759	17945872
Chemicals efficiency (€ per unit of ressource used) 2005	1	36%	253%	604	564970	1303716	11	108198	22084517
Chemicals efficiency (€ per unit of ressource used) 2006	1	34%	393%	460	684428	1630309	11	106726	21562808
Construction & Materials efficiency (€ per unit of ressource used) 2004	1	24%	892%	56	28533	69813	38	57432	4620452
Construction & Materials efficiency (€ per unit of ressource used) 2005	1	25%	688%	72	32542	80783	37	65318	4965442
Construction & Materials efficiency (€ per unit of ressource used) 2006	1	28%	916%	74	32197	93453	42	65484	6457536
Industrial Metals efficiency (€ per unit of ressource used) 2004	1	32%	555%	139	122278	50269	32	80575	28740881
Industrial Metals efficiency (€ per unit of ressource used) 2005	1	33%	686%	180	165296	72556	38	103074	45641100
Industrial Metals efficiency (€ per unit of ressource used) 2006	1	32%	978%	171	252266	81760	36	106372	60860253
Mining efficiency (€ per unit of ressource used) 2004	1	28%	3613%	219	180975	29836	20	99788	15466478
Mining efficiency (€ per unit of ressource used) 2005	1	36%	4452%	342	142686	41773	29	166790	24829714
Mining efficiency (€ per unit of ressource used) 2006	1	35%	10962%	367	317611	53331	33	169641	22704680
Oil & Gas Producers efficiency (€ per unit of ressource used) 2004	1	31%	606%	308	121899	144580	72	328705	108207306
Oil & Gas Producers efficiency (€ per unit of ressource used) 2005	1	39%	1060%	457	178342	225322	116	507909	146513347
Oil & Gas Producers efficiency (€ per unit of ressource used) 2006	1	39%	622%	476	175484	236108	143	505313	177675464

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11.5 Intra-sector results

Sustainability Value:			Chemicals				
2004			2005			2006	
Bayer	2'332'026'518	€	Bayer	2'552'333'901	€	Bayer	3'070'608'271 €
BASF	627'567'357	€	BASF	168'938'625	€	BASF	2'681'722'524 €
Akzo Nobel	-68'358'022	€	Akzo Nobel	-424'930'917	€	Akzo Nobel	-1'332'126'495 €
DSM NV	-1'227'211'348	€	Dupont De Nemours	-735'764'260	€	DSM NV	-1'606'134'489 €
Dupont De Nemours	-1'664'024'505	€	DSM NV	-1'560'577'349	€	Dupont De Nemours	-2'814'069'811 €

Return to Cost:		Chemicals			
2004		2005		2006	
Bayer	1.424	Bayer	1.446	Bayer	1.428
BASF	1.066	BASF	1.015	BASF	1.246
Akzo Nobel	0.986	Akzo Nobel	0.919	Akzo Nobel	0.791
Dupont De Nemours	0.734	Dupont De Nemours	0.898	Dupont De Nemours	0.669
DSM NV	0.608	DSM NV	0.573	DSM NV	0.577

Sustainability Value:			Industrial Metals				
2004			2005			2006	
Norsk Hydro	2'438'195'587	€	Norsk Hydro	3'751'780'967	€	Norsk Hydro	4'220'543'590 €
POSCO	1'458'459'300	€	POSCO	1'782'486'221	€	Arcelor	628'525'676 €
Arcelor	811'171'642	€	Arcelor	179'475'662	€	POSCO	64'650'316 €
Alcoa	-927'409'200	€	Alcoa	-2'153'726'103	€	Alcan	-2'441'001'294 €
Alcan	-3'780'417'330	€	Alcan	-3'560'016'747	€	Alcoa	-2'472'718'289 €

Return to Cost:		Industrial Metals			
2004		2005		2006	
Norsk Hydro	1.816	Norsk Hydro	1.901	Norsk Hydro	1.997
POSCO	1.410	POSCO	1.414	Arcelor	1.066
Arcelor	1.108	Arcelor	1.019	POSCO	1.014
Alcoa	0.871	Alcoa	0.772	Alcoa	0.758
Alcan	0.457	Alcan	0.542	Alcan	0.690

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Intra-sector Results (cont'd)

Sustainability Value:			Mining		
2004		2005		2006	
BHP Biliton	2'853'820'379 €	BHP Biliton	3'796'326'291 €	BHP Biliton	3'557'186'272 €
Rio Tinto Group	393'191'274 €	Rio Tinto Group	1'821'385'051 €	Rio Tinto Group	2'956'227'102 €
Xstrata	-530'293'825 €	Xstrata	-393'270'558 €	Xstrata	-2'371'512'488 €
Anglo American	-2'716'717'828 €	Anglo American	-5'224'440'784 €	Anglo American	-4'141'900'886 €

Return to Cost:			Mining		
2004		2005		2006	
BHP Biliton	1.480	BHP Biliton	1.337	Rio Tinto Group	1.423
Rio Tinto Group	1.096	Rio Tinto Group	1.277	BHP Biliton	1.273
Xstrata	0.768	Xstrata	0.884	Anglo American	0.737
Anglo American	0.752	Anglo American	0.652	Xstrata	0.563

Sustainability Value:			Oil & Gas Producers		
2004		2005		2006	
Statoil	4'600'781'872 €	Shell	9'023'569'881 €	Exxon Mobil	9'073'581'409 €
Exxon Mobil	4'383'457'255 €	Statoil	6'590'522'558 €	Statoil	8'621'048'153 €
Shell	1'034'907'633 €	Exxon Mobil	4'094'236'961 €	Shell	-4'347'937'500 €
Encana	-4'345'033'976 €	Encana	-8'034'094'153 €	BP	-5'923'499'720 €
BP	-5'674'112'784 €	BP	-11'674'235'245 €	Encana	-7'423'192'343 €

Return to Cost:			Oil & Gas Producers		
2004		2005		2006	
Statoil	1.991	Statoil	1.935	Statoil	2.146
Exxon Mobil	1.126	Shell	1.238	Exxon Mobil	1.176
Shell	1.034	Exxon Mobil	1.072	Shell	0.908
BP	0.819	BP	0.759	BP	0.854
Encana	0.468	Encana	0.389	Encana	0.473

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11.6 Resources consumption average relative to the five sectors average and specific to each sector

	Value	Capital employed	Pension funding	CO_2 Emissions	NO_x Emissions	SO_x Emissions	Water consumption	Group Employess	Lost Time Injuries
Average All Sector 2004	8526166866	27970547590	1482978002	40989447	75966	96994	297684921	62067	346
Average All Sector 2005	11981176881	33157402731	1554289197	41088697	85183	97740	302926080	61974	367
Average All Sector 2006	12442757733	34593734756	1745355027	43928787	81740	90420	298122252	66689	358
Average Chemicals 2004	5859865423	17810630835	2040140000	11277515	10890	4423	635086005	63862	327
Average Chemicals 2005	6636190346	18643881037	2620640000	10980000	11746	5090	628440910	61334	300
Average Chemicals 2006	7349290730	21311427687	1869696619	15969232	10738	4508	644948040	68861	341
Average Construction & Materials 2004	2931353353	12268644140	328494531	52550000	102737	41988	76684980	51040	634
Average Construction & Materials 2005	3924915570	15546768017	570482477	54442000	120612	48586	107478154	60089	790
Average Construction & Materials 2006	4605733922	16562660764	502575938	62034000	143050	49284	110738604	70334	713
Average Industrial Metals 2004	5633503365	17746537551	1015718071	40637480	46071	112066	177299485	69916	196
Average Industrial Metals 2005	7039184885	21352704833	1026263507	39087135	42585	97017	183744951	68293	154
Average Industrial Metals 2006	7290240027	22942224208	745296694	42669536	28899	89166	201181054	68535	120
Average Mining 2004	5817679864	20805122618	161028217	26596500	32146	194987	297767500	58300	376
Average Mining 2005	9059808309	25215546360	203512920	26494000	63495	216883	316137500	54319	365
Average Mining 2006	10300125028	29347768432	93960749	28036500	32430	193136	311467500	60717	454
Average Oil & Gas Producers 2004	21846734927	69788717811	3605119236	71007151	179220	151105	301603150	66463	202
Average Oil & Gas Producers 2005	32661511582	83439742134	3080391826	71521410	183140	144955	281471171	64306	223
Average Oil & Gas Producers 2006	32239872415	81755399426	5184966280	67756212	183720	136547	224945113	63802	181

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11.7 Companies' efficiency rates (€ per unit of resource used)

	Value	Capital employed	Pension funding	CO2 Emissions	NOx Emissions	SOx Emissions	Water consumption	Group Employess	Lost Time Injuries
Akzo Nobel 2004	1	0.581	1.02031	1'040	1'143'708	1'206'993	12	77'657	24'587'333
Akzo Nobel 2005	1	0.558	0.83199	1'100	2'121'930	1'263'185	13	78'923	21'729'034
Akzo Nobel 2006	1	0.552	0.92504	968	2'434'720	1'133'754	14	81'341	23'412'566
Alcan 2004	1	0.179	2.61375	102	71'635	25'842	12	38'825	7'231'019
Alcan 2005	1	0.240	3.10377	165	132'261	37'096	16	66'773	15'660'237
Alcan 2006	1	0.312	5.96773	196	226'982	53'156	19	83'414	27'087'458
Alcoa 2004	1	0.321	3.36337	208	121'653	21'417	63	52'444	58'270'692
Alcoa 2005	1	0.325	3.82331	242	163'525	26'913	69	56'663	62'959'173
Alcoa 2006	1	0.341	5.00703	256	181'598	29'584	75	62'895	89'850'129
Anglo American 2004	1	0.254	19.8566	278	160'683	28'288	14	57'643	9'480'963
Anglo American 2005	1	0.274	25.9948	329	219'023	36'047	16	76'487	10'305'096
Anglo American 2006	1	0.406	159.409	351	272'208	44'344	20	89'250	9'744'106
Arcelor 2004	1	0.396	4.60399	114	159'284	151'115	30	87'747	30'869'568
Arcelor 2005	1	0.374	6.3105	135	185'283	180'532	35	99'022	40'389'770
Arcelor 2006	1	0.306	10.6055	119	2'673'810	160'098	30	97'243	51'386'862
BASF 2004	1	0.378	2.83828	493	680'373	1'619'937	5	124'527	41'502'318
BASF 2005	1	0.420	2.01122	582	716'900	1'489'662	6	141'697	50'408'593
BASF 2006	1	0.434	8.10142	670	844'460	1'942'257	7	142'738	54'123'538
Bayer 2004	1	0.299	4.06483	1'866	1'822'558	1'865'952	17	85'463	20'043'779
Bayer 2005	1	0.299	5.22145	2'178	1'924'651	1'839'111	19	100'194	23'498'467
Bayer 2006	1	0.254	6.76172	2'696	2'561'000	2'695'789	22	96'642	21'855'892
BHP Biliton 2004	1	0.346	38.4065	198	153'965	174'218	57	257'142	32'566'075
BHP Biliton 2005	1	0.450	34.4156	351	91'183	161'198	74	453'661	73'659'716
BHP Biliton 2006	1	0.457	54.7525	375	260'566	216'030	89	490'105	64'656'259
BP 2004	1	0.265	4.63906	297	119'686	204'226	52	250'073	59'756'357
BP 2005	1	0.322	5.35034	422	168'745	296'665	77	382'395	91'375'477
BP 2006	1	0.322	7.69884	500	177'037	327'352	101	357'725	96'392'735
Cemex 2004	1	0.169	21.0444	30	26'919	97'433	23	55'571	3'125'071
Cemex 2005	1	0.211	6.07219	53	23'947	80'909	19	53'054	2'883'995
Cemex 2006	1	0.206	4.69628	47	20'731	80'161	20	48'418	2'820'155
CRH 2004	1	0.385	-	361	161'692	734'964	130	63'665	3'505'643
CRH 2005	1	0.352	10.0264	400	186'649	752'817	133	67'958	3'912'110
CRH 2006	1	0.382	21.1924	458	220'705	692'463	132	69'629	4'792'548
DSM NV 2004	1	0.265	-	388	118'961	732'069	9	78'639	8'885'762
DSM NV 2005	1	0.270	-	381	112'757	655'398	10	96'117	11'721'585
DSM NV 2006	1	0.286	-	372	126'829	877'657	11	99'032	10'424'373
Dupont De Nemours 2004	1	0.224	-	208	305'865	905'001	43	76'356	7'798'540
Dupont De Nemours 2005	1	0.298	-	302	370'319	1'044'722	63	108'321	12'471'368
Dupont De Nemours 2006	1	0.314	7.97086	127	399'226	1'183'170	26	96'229	10'161'719

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Companies' efficiency rates (€ per unit of resource used), (cont'd)

	Value	Capital employed	Pension funding	CO2 Emissions	NOx Emissions	SOx Emissions	Water consumption	Group Employess	Lost Time Injuries
Encana 2004	1	0.183	-	687	13'789	658'555	15	594'864	279'027'144
Encana 2005	1	0.207	-	837	16'222	729'968	21	764'365	276'583'011
Encana 2006	1	0.279	-	775	19'006	978'275	32	1'011'906	366'154'983
Exxon Mobil 2004	1	0.348	5.07228	266	222'375	138'297	99	455'093	134'036'902
Exxon Mobil 2005	1	0.445	7.13687	395	371'049	239'575	162	724'429	132'965'727
Exxon Mobil 2006	1	0.471	5.54439	388	377'434	258'582	214	741'059	199'686'088
HeidelbergCement 2004	1	0.163	49.8485	33	16'450	37'013	20	35'198	2'751'670
HeidelbergCement 2005	1	0.264	27.26	57	28'276	66'143	30	60'982	3'244'999
HeidelbergCement 2006	1	0.343	42.6156	68	35'525	87'663	36	70'195	7'408'237
Holcim 2004	1	0.231	16.0275	42	21'495	52'942	30	65'028	5'279'187
Holcim 2005	1	0.228	9.32327	61	28'203	85'338	34	76'326	6'904'556
Holcim 2006	1	0.250	14.7921	56	29'181	94'922	34	63'229	8'007'732
Lafarge 2004	1	0.233	3.40311	54	22'811	50'225	41	60'493	10'729'915
Lafarge 2005	1	0.237	3.84474	59	24'755	47'168	37	65'194	13'360'073
Lafarge 2006	1	0.254	4.86942	64	21'492	54'841	47	72'570	17'880'778
Norsk Hydro 2004	1	0.321	36.1167	890	135'948	798'036	37	156'821	36'779'341
Norsk Hydro 2005	1	0.348	31.7167	1'434	190'467	1'217'622	51	241'555	56'651'946
Norsk Hydro 2006	1	0.414	34.4418	1'338	273'781	1'363'790	54	254'546	80'593'248
POSCO 2004	1	0.367	96.8847	79	117'782	59'707	44	258'833	309'247'631
POSCO 2005	1	0.337	74.6517	97	142'800	152'278	53	320'519	845'677'934
POSCO 2006	1	0.223	63.589	74	109'143	363'899	39	269'970	427'383'863
Rio Tinto Group 2004	1	0.259	-	192	239'734	21'403	12	139'833	27'245'197
Rio Tinto Group 2005	1	0.398	-	341	195'119	31'774	23	262'672	59'404'413
Rio Tinto Group 2006	1	0.457	-	382	447'487	54'892	25	284'220	71'990'993
Royal Dutch Shell 2004	1	0.320	6.57218	295	158'887	102'963	89	276'998	175'404'052
Royal Dutch Shell 2005	1	0.413	-	469	255'015	156'409	157	430'485	302'885'118
Royal Dutch Shell 2006	1	0.357	4.10557	457	238'526	145'050	151	397'544	314'672'029
Statoil 2004	1	0.451	-	943	297'195	251'680	1'444	385'211	97'571'254
Statoil 2005	1	0.493	-	1'324	392'982	342'854	2'005	531'761	168'363'957
Statoil 2006	1	0.576	-	1'615	510'955	414'687	2'124	634'801	182'716'561
Xstrata 2004	1	0.216	-	196	1'172'354	7'679	23	73'272	8'754'391
Xstrata 2005	1	0.285	-	346	2'717'370	12'559	40	124'076	18'271'785
Xstrata 2006	1	0.099	-	344	2'551'085	12'100	36	69'449	13'326'420

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11.8 Companies' Performance

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Akzo Nobel **Chemicals**

Performance Data	2004	2005	2006
Value	4'772'000'000 €	4'838'000'000 €	5'035'000'000 €
Capital employed	8'214'000'000 €	8'671'000'000 €	9'127'000'000 €
Pension funding	4'677'000'000 €	5'815'000'000 €	5'443'000'000 €
CO2 Emissions	4'587'573 €	4'400'000 €	5'200'000 €
NOx Emissions	4'172 t	2'280 t	2'068 t
SOx Emissions	3'954 t	3'830 t	4'441 t
Water consumption	390'000'000 t	360'000'000 t	360'000'000 t
Group Employess	61'450	61'300	61'900
Lost Time Injuries	194	223	215

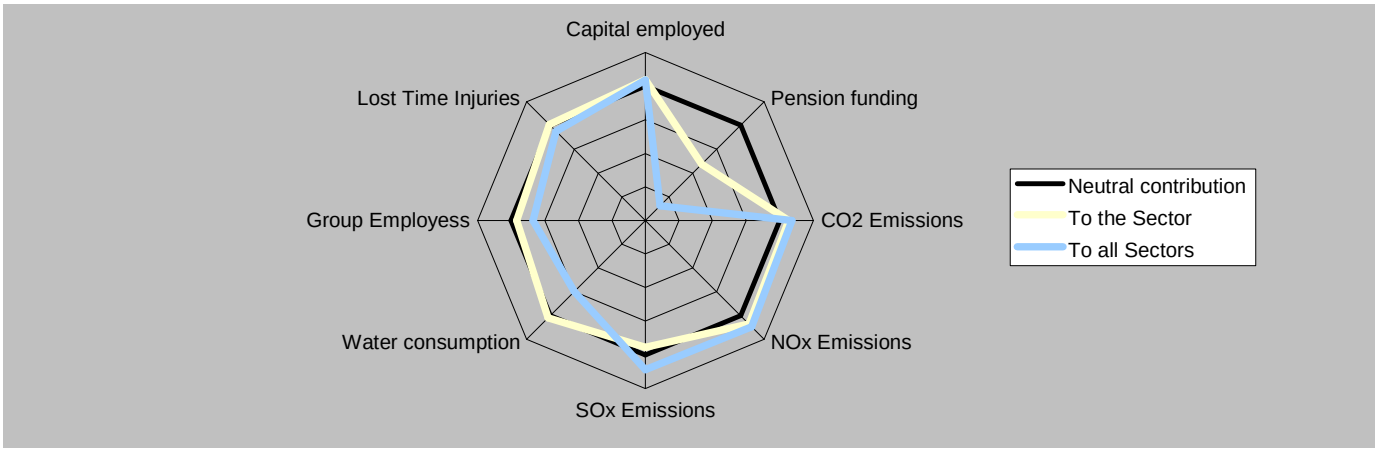
Performance 2006	
To all sectors	
SV Contribution	**-4'781'883'532 €**
Return to cost	**0.513**
To Chemicals	
To all sectors	**-1'332'126'495 €**
Return to cost	**0.791**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	2'503'845'676 €	3'133'200'317 €	3'282'821'315 €	2'702'483'423 €	3'086'396'356 €	3'147'465'176 €
Pension funding	26'889'732'934 €	44'824'697'812 €	38'803'526'667 €	13'433'681'307 €	14'725'199'518 €	21'395'016'196 €
CO2 Emissions	954'255'787 €	1'283'009'254 €	1'472'891'558 €	2'383'731'166 €	2'659'311'250 €	2'393'121'489 €
NOx Emissions	468'296'784 €	320'686'559 €	314'799'141 €	2'245'118'396 €	1'288'131'430 €	1'415'396'527 €
SOx Emissions	347'538'791 €	469'487'463 €	611'131'878 €	5'237'801'731 €	4'993'231'683 €	7'240'204'239 €
Water consumption	11'170'216'709 €	14'238'535'266 €	15'025'355'374 €	3'598'485'080 €	3'801'516'558 €	4'102'260'177 €
Group Employess	8'441'403'680 €	11'850'803'543 €	11'549'274'857 €	5'638'562'180 €	6'632'511'629 €	6'606'348'658 €
Lost Time Injuries	4'785'553'322 €	7'275'370'482 €	7'475'267'462 €	3'483'000'897 €	4'917'148'912 €	4'637'199'498 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	2'268'154'324 €	1'704'799'683 €	1'752'178'685 €	2'069'516'577 €	1'751'603'644 €	1'887'534'824 €
Pension funding	-22'117'732'934 €	-39'986'697'812 €	-33'768'526'667 €	-8'661'681'307 €	-9'887'199'518 €	-16'360'016'196 €
CO2 Emissions	3'817'744'213 €	3'554'990'746 €	3'562'108'442 €	2'388'268'834 €	2'178'688'750 €	2'641'878'511 €
NOx Emissions	4'303'703'216 €	4'517'313'441 €	4'720'200'859 €	2'526'881'604 €	3'549'868'570 €	3'619'603'473 €
SOx Emissions	4'424'461'209 €	4'368'512'537 €	4'423'868'122 €	-465'801'731 €	-155'231'683 €	-2'205'204'239 €
Water consumption	-6'398'216'709 €	-9'400'535'266 €	-9'990'355'374 €	1'173'514'920 €	1'036'483'442 €	932'739'823 €
Group Employess	-3'669'403'680 €	-7'012'803'543 €	-6'514'274'857 €	-866'562'180 €	-1'794'511'629 €	-1'571'348'658 €
Lost Time Injuries	-13'553'322 €	-2'437'370'482 €	-2'440'267'462 €	1'288'999'103 €	-79'148'912 €	397'800'502 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.9 €	1.5 €	1.5 €	1.77 €	1.57 €	1.60 €
Pension funding	0.2 €	0.1 €	0.1 €	0.36 €	0.33 €	0.24 €
CO2 Emissions	5.0 €	3.8 €	3.4 €	2.00 €	1.82 €	2.10 €
NOx Emissions	10.2 €	15.1 €	16.0 €	2.13 €	3.76 €	3.56 €
SOx Emissions	13.7 €	10.3 €	8.2 €	0.91 €	0.97 €	0.70 €
Water consumption	0.4 €	0.3 €	0.3 €	1.33 €	1.27 €	1.23 €
Group Employess	0.6 €	0.4 €	0.4 €	0.85 €	0.73 €	0.76 €
Lost Time Injuries	1.0 €	0.7 €	0.7 €	1.37 €	0.98 €	1.09 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-2'173'105'460 €	-5'586'473'837 €	-4'781'883'532 €	-68'358'022 €	-424'930'917 €	-1'332'126'495 €
Return to Costs	0.69	0.46	0.51	0.99	0.92	0.79



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Alcan — **Industrial Metals**

Performance Data	2004	2005	2006
Value	3'183'679'969 €	4'206'682'882 €	5'421'923'028 €
Capital employed	17'790'663'318 €	17'558'689'411 €	17'397'893'461 €
Pension funding	1'218'052'888 €	1'355'345'381 €	908'539'820 €
CO2 Emissions	31'196'899 €	25'437'674 €	27'649'678 €
NOx Emissions	44'443 t	31'806 t	23'887 t
SOx Emissions	123'200 t	113'400 t	102'000 t
Water consumption	254'800'000 t	267'000'000 t	284'300'000 t
Group Employess	82'000	63'000	65'000
Lost Time Injuries	440	269	200

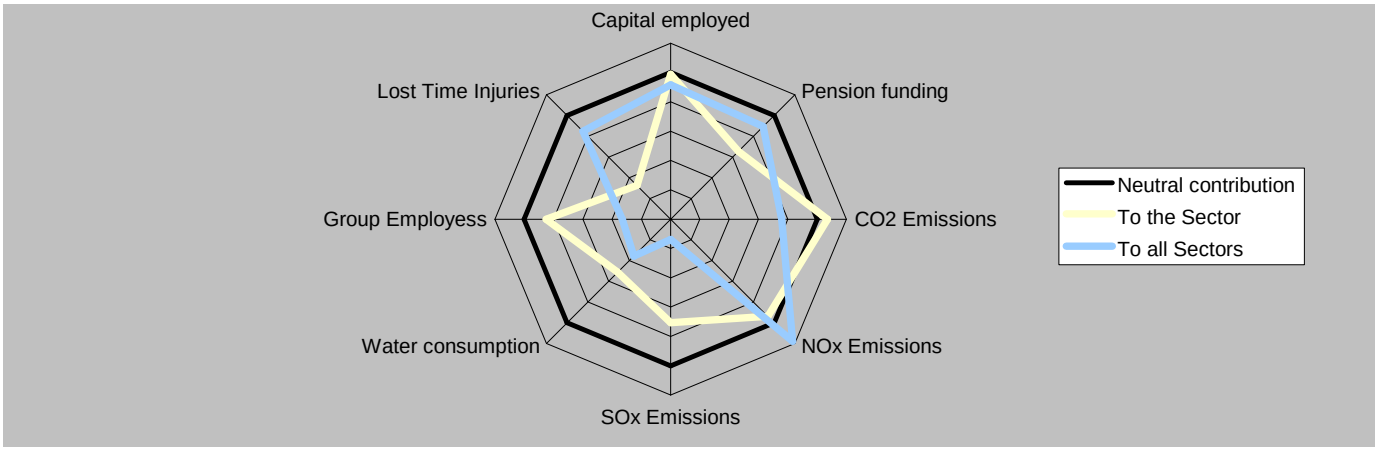
Performance 2006	
To all sectors	
SV Contribution	**-3'226'849'640 €**
Return to cost	**0.627**
To Industrial Metals	
To all sectors	**-2'441'001'294 €**
Return to cost	**0.690**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	5'423'067'376 €	6'344'699'714 €	6'257'716'171 €	5'647'510'754 €	5'788'440'484 €	5'528'444'764 €
Pension funding	7'003'018'358 €	10'447'626'333 €	6'477'043'748 €	6'755'718'184 €	9'296'371'407 €	8'887'029'031 €
CO2 Emissions	6'489'230'475 €	7'417'448'107 €	7'831'726'371 €	4'324'772'050 €	4'581'059'569 €	4'724'044'583 €
NOx Emissions	4'988'137'924 €	4'473'550'599 €	3'636'181'020 €	5'434'389'467 €	5'257'384'887 €	6'025'885'282 €
SOx Emissions	10'829'746'821 €	13'900'751'514 €	14'036'354'786 €	6'193'187'556 €	8'227'856'153 €	8'339'551'878 €
Water consumption	7'297'874'916 €	10'560'246'989 €	11'865'857'036 €	8'096'000'164 €	10'228'647'685 €	10'302'238'706 €
Group Employess	11'264'362'925 €	12'179'455'517 €	12'127'671'498 €	6'607'137'609 €	6'493'636'924 €	6'914'193'024 €
Lost Time Injuries	10'856'080'278 €	8'777'505'631 €	6'957'630'715 €	12'654'062'606 €	12'260'199'924 €	12'182'007'307 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-2'239'387'407 €	-2'138'016'832 €	-835'793'143 €	-2'463'830'785 €	-1'581'757'602 €	-106'521'736 €
Pension funding	-3'819'338'389 €	-6'240'943'451 €	-1'055'120'720 €	-3'572'038'215 €	-5'089'688'524 €	-3'465'106'003 €
CO2 Emissions	-3'305'550'506 €	-3'210'765'224 €	-2'409'803'343 €	-1'141'092'081 €	-374'376'687 €	697'878'445 €
NOx Emissions	-1'804'457'955 €	-266'867'716 €	1'785'742'008 €	-2'250'709'498 €	-1'050'702'004 €	-603'962'254 €
SOx Emissions	-7'646'066'851 €	-9'694'068'632 €	-8'614'431'758 €	-3'009'507'587 €	-4'021'173'270 €	-2'917'628'850 €
Water consumption	-4'114'194'947 €	-6'353'564'107 €	-6'443'934'008 €	-4'912'320'195 €	-6'021'964'803 €	-4'880'315'678 €
Group Employess	-8'080'682'956 €	-7'972'772'635 €	-6'705'748'470 €	-3'423'457'640 €	-2'286'954'042 €	-1'492'269'996 €
Lost Time Injuries	-7'672'400'309 €	-4'570'822'749 €	-1'535'707'688 €	-9'470'382'637 €	-8'053'517'042 €	-6'760'084'279 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.6 €	0.7 €	0.9 €	0.56 €	0.73 €	0.98 €
Pension funding	0.5 €	0.4 €	0.8 €	0.47 €	0.45 €	0.61 €
CO2 Emissions	0.5 €	0.6 €	0.7 €	0.74 €	0.92 €	1.15 €
NOx Emissions	0.6 €	0.9 €	1.5 €	0.59 €	0.80 €	0.90 €
SOx Emissions	0.3 €	0.3 €	0.4 €	0.51 €	0.51 €	0.65 €
Water consumption	0.4 €	0.4 €	0.5 €	0.39 €	0.41 €	0.53 €
Group Employess	0.3 €	0.3 €	0.4 €	0.48 €	0.65 €	0.78 €
Lost Time Injuries	0.3 €	0.5 €	0.8 €	0.25 €	0.34 €	0.45 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-4'835'259'915 €	-5'055'977'668 €	-3'226'849'640 €	-3'780'417'330 €	-3'560'016'747 €	-2'441'001'294 €
Return to Costs	0.40	0.45	0.63	0.46	0.54	0.69



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Alcoa — **Industrial Metals**

Performance Data	2004	2005	2006
Value	6'240'791'107 €	7'309'560'041 €	7'736'096'082 €
Capital employed	19'451'174'472 €	22'491'133'255 €	22'658'179'889 €
Pension funding	1'855'517'802 €	1'911'839'216 €	1'545'048'117 €
CO2 Emissions	30'000'000 €	30'200'000 €	30'200'000 €
NOx Emissions	51'300 t	44'700 t	42'600 t
SOx Emissions	291'400 t	271'600 t	261'500 t
Water consumption	98'600'000 t	105'700'000 t	103'400'000 t
Group Employess	119'000	129'000	123'000
Lost Time Injuries	107	116	86

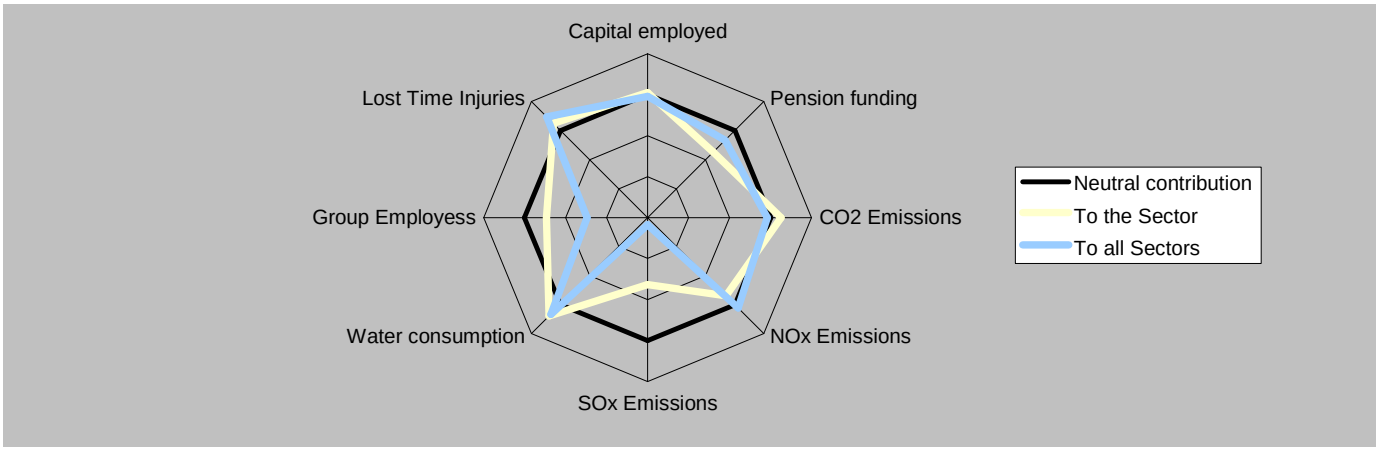
Performance 2006	
To all sectors	
SV Contribution	**-4'819'706'470 €**
Return to cost	**0.616**
To Industrial Metals	
To all sectors	**-2'472'718'289 €**
Return to cost	**0.758**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	5'929'235'342 €	8'127'001'019 €	8'149'748'647 €	6'174'627'390 €	7'414'481'982 €	7'199'980'633 €
Pension funding	10'668'030'392 €	14'737'337'083 €	11'014'755'798 €	10'291'306'293 €	13'113'386'208 €	15'113'137'776 €
CO2 Emissions	6'240'264'858 €	8'806'108'968 €	8'554'100'973 €	4'158'847'979 €	5'438'704'683 €	5'159'776'075 €
NOx Emissions	5'757'754'274 €	6'287'144'377 €	6'484'740'522 €	6'272'857'660 €	7'388'747'953 €	10'746'522'864 €
SOx Emissions	25'615'164'152 €	33'293'157'947 €	35'985'360'555 €	14'648'497'190 €	19'706'223'378 €	21'380'321'726 €
Water consumption	2'824'059'917 €	4'180'592'160 €	4'315'615'960 €	3'132'910'581 €	4'049'318'578 €	3'746'927'479 €
Group Employess	16'347'063'270 €	24'938'885'107 €	22'949'286'066 €	9'588'407'018 €	13'296'494'654 €	13'083'780'646 €
Lost Time Injuries	2'640'782'372 €	3'793'690'417 €	2'992'811'903 €	3'078'148'338 €	5'298'931'715 €	5'240'067'770 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	311'555'765 €	-817'440'978 €	-413'652'565 €	66'163'716 €	-104'921'941 €	536'115'450 €
Pension funding	-4'427'239'286 €	-7'427'777'042 €	-3'278'659'716 €	-4'050'515'187 €	-5'803'826'168 €	-7'377'041'693 €
CO2 Emissions	526'248 €	-1'496'548'927 €	-818'004'890 €	2'081'943'128 €	1'870'855'358 €	2'576'320'007 €
NOx Emissions	483'036'832 €	1'022'415'664 €	1'251'355'561 €	-32'066'553 €	-79'187'912 €	-3'010'426'782 €
SOx Emissions	-19'374'373'045 €	-25'983'597'907 €	-28'249'264'472 €	-8'407'706'083 €	-12'396'663'337 €	-13'644'225'643 €
Water consumption	3'416'731'190 €	3'128'967'880 €	3'420'480'122 €	3'107'880'525 €	3'260'241'463 €	3'989'168'604 €
Group Employess	-10'106'272'163 €	-17'629'325'066 €	-15'213'189'983 €	-3'347'615'912 €	-5'986'934'614 €	-5'347'684'563 €
Lost Time Injuries	3'600'008'735 €	3'515'869'623 €	4'743'284'180 €	3'162'642'769 €	2'010'628'326 €	2'496'028'312 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.1 €	0.9 €	0.9 €	1.01 €	0.99 €	1.07 €
Pension funding	0.6 €	0.5 €	0.7 €	0.61 €	0.56 €	0.51 €
CO2 Emissions	1.0 €	0.8 €	0.9 €	1.50 €	1.34 €	1.50 €
NOx Emissions	1.1 €	1.2 €	1.2 €	0.99 €	0.99 €	0.72 €
SOx Emissions	0.2 €	0.2 €	0.2 €	0.43 €	0.37 €	0.36 €
Water consumption	2.2 €	1.7 €	1.8 €	1.99 €	1.81 €	2.06 €
Group Employess	0.4 €	0.3 €	0.3 €	0.65 €	0.55 €	0.59 €
Lost Time Injuries	2.4 €	1.9 €	2.6 €	2.03 €	1.38 €	1.48 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-3'262'003'216 €	-5'710'929'594 €	-4'819'706'470 €	-927'409'200 €	-2'153'726'103 €	-2'472'718'289 €
Return to Costs	0.66	0.56	0.62	0.87	0.77	0.76



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Anglo American — **Mining**

Performance Data	2004	2005	2006
Value	8'243'019'648 €	9'790'322'581 €	11'596'044'556 €
Capital employed	32'404'343'330 €	35'754'095'592 €	28'554'974'615 €
Pension funding	415'127'788 €	376'625'570 €	72'743'805 €
CO2 Emissions	29'690'000 €	29'800'000 €	33'000'000 €
NOx Emissions	51'300 t	44'700 t	42'600 t
SOx Emissions	291'400 t	271'600 t	261'500 t
Water consumption	585'000'000 t	616'000'000 t	582'000'000 t
Group Employess	143'000	128'000	129'928
Lost Time Injuries	869	950	1'190

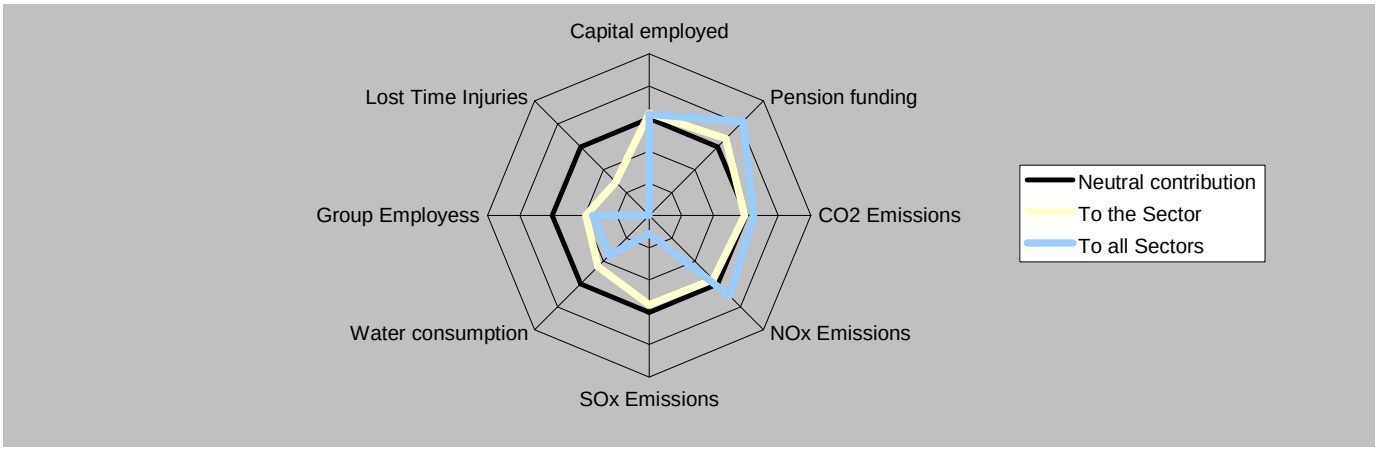
Performance 2006	
To all sectors	
SV Contribution	**-7'467'152'341 €**
Return to cost	**0.608**
To Mining	
To all sectors	**-4'141'900'886 €**
Return to cost	**0.737**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	9'877'705'738 €	12'919'472'221 €	10'270'721'959 €	9'061'138'411 €	12'846'251'583 €	10'021'879'837 €
Pension funding	2'386'716'991 €	2'903'203'330 €	518'595'663 €	14'997'871'943 €	16'766'284'257 €	7'974'290'345 €
CO2 Emissions	6'175'782'122 €	8'689'471'763 €	9'347'196'427 €	6'494'347'571 €	10'190'318'095 €	12'123'629'053 €
NOx Emissions	5'757'754'274 €	6'287'144'377 €	6'484'740'522 €	9'284'030'860 €	6'378'066'765 €	13'530'208'975 €
SOx Emissions	25'615'164'152 €	33'293'157'947 €	35'985'360'555 €	8'694'262'909 €	11'345'504'750 €	13'946'046'392 €
Water consumption	16'755'325'063 €	24'363'715'900 €	24'290'991'188 €	11'429'530'491 €	17'653'210'766 €	19'246'543'432 €
Group Employess	19'643'949'980 €	24'745'560'416 €	24'241'909'268 €	14'269'719'608 €	21'349'082'289 €	22'041'094'494 €
Lost Time Injuries	21'437'643'462 €	31'043'782'409 €	41'366'059'589 €	13'446'998'018 €	23'589'388'412 €	27'019'871'004 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-1'634'686'090 €	-3'129'149'641 €	1'325'322'597 €	-818'118'763 €	-3'055'929'002 €	1'574'164'718 €
Pension funding	5'856'302'658 €	6'887'119'251 €	11'077'448'893 €	-6'754'852'295 €	-6'975'961'677 €	3'621'754'211 €
CO2 Emissions	2'067'237'527 €	1'100'850'818 €	2'248'848'129 €	1'748'672'078 €	-399'995'515 €	-527'584'497 €
NOx Emissions	2'485'265'374 €	3'503'178'204 €	5'111'304'034 €	-1'041'011'211 €	3'412'255'816 €	-1'934'164'419 €
SOx Emissions	-17'372'144'503 €	-23'502'835'367 €	-24'389'315'999 €	-451'243'261 €	-1'555'182'169 €	-2'350'001'837 €
Water consumption	-8'512'305'415 €	-14'573'393'319 €	-12'694'946'633 €	-3'186'510'843 €	-7'862'888'186 €	-7'650'498'877 €
Group Employess	-11'400'930'331 €	-14'955'237'836 €	-12'645'864'712 €	-6'026'699'959 €	-11'558'759'709 €	-10'445'049'939 €
Lost Time Injuries	-13'194'623'814 €	-21'253'459'828 €	-29'770'015'033 €	-5'203'978'370 €	-13'799'065'831 €	-15'423'826'448 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.8 €	0.8 €	1.1 €	0.91 €	0.76 €	1.16 €
Pension funding	3.5 €	3.4 €	22.4 €	0.55 €	0.58 €	1.45 €
CO2 Emissions	1.3 €	1.1 €	1.2 €	1.27 €	0.96 €	0.96 €
NOx Emissions	1.4 €	1.6 €	1.8 €	0.89 €	1.53 €	0.86 €
SOx Emissions	0.3 €	0.3 €	0.3 €	0.95 €	0.86 €	0.83 €
Water consumption	0.5 €	0.4 €	0.5 €	0.72 €	0.55 €	0.60 €
Group Employess	0.4 €	0.4 €	0.5 €	0.58 €	0.46 €	0.53 €
Lost Time Injuries	0.4 €	0.3 €	0.3 €	0.61 €	0.42 €	0.43 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-5'213'235'574 €	-8'240'365'965 €	-7'467'152'341 €	-2'716'717'828 €	-5'224'440'784 €	-4'141'900'886 €
Return to Costs	0.61	0.54	0.61	0.75	0.65	0.74



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Arcelor — **Industrial Metals**

Performance Data	2004	2005	2006
Value	8'301'000'000 €	9'674'000'000 €	10'107'000'000 €
Capital employed	20'941'000'000 €	25'860'000'000 €	33'007'000'000 €
Pension funding	1'803'000'000 €	1'533'000'000 €	953'000'000 €
CO2 Emissions	72'772'500 €	71'448'000 €	85'065'000 €
NOx Emissions	52'115 t	52'212 t	3'780 t
SOx Emissions	54'932 t	53'586 t	63'130 t
Water consumption	273'741'424 t	274'844'753 t	340'605'269 t
Group Employess	94'601	97'695	103'935
Lost Time Injuries	269	240	197

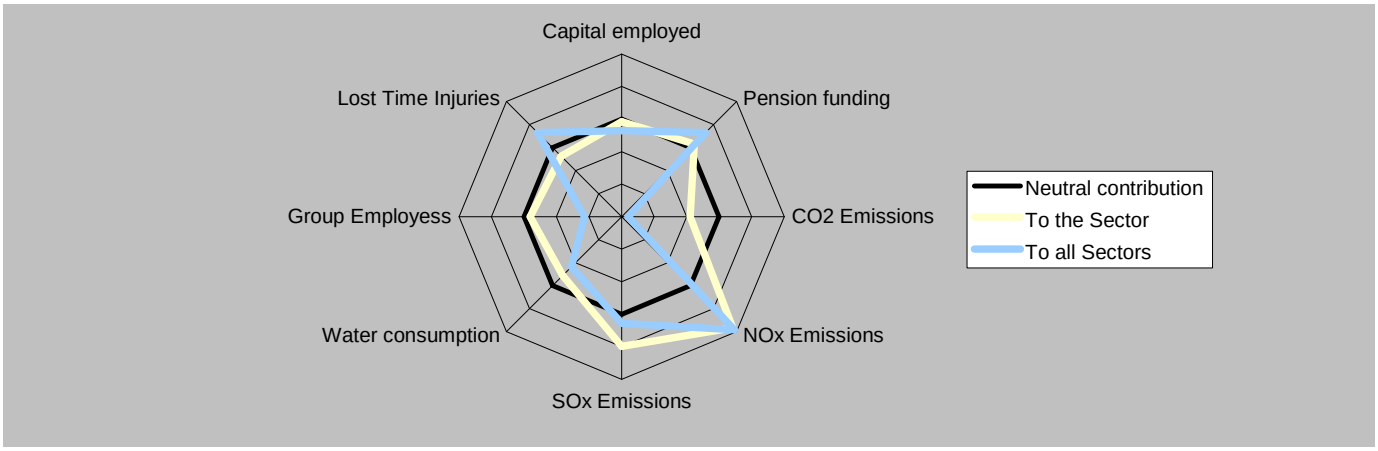
Performance 2006	
To all sectors	
SV Contribution	**-1'451'511'760 €**
Return to cost	**0.874**
To Industrial Metals	
To all sectors	**628'525'676 €**
Return to cost	**1.066**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	6'383'373'789 €	9'344'315'556 €	11'872'037'159 €	6'647'561'173 €	8'525'070'830 €	10'488'475'328 €
Pension funding	10'366'086'911 €	11'817'069'948 €	6'794'003'475 €	10'000'025'453 €	10'514'911'968 €	9'321'923'468 €
CO2 Emissions	15'137'322'480 €	20'833'737'534 €	24'094'523'153 €	10'088'325'484 €	12'867'038'813 €	14'533'654'035 €
NOx Emissions	5'849'171'250 €	7'343'722'197 €	575'406'553 €	6'372'453'032 €	8'630'454'320 €	953'564'705 €
SOx Emissions	4'828'686'992 €	6'568'656'708 €	8'687'402'722 €	2'761'372'421 €	3'887'988'534 €	5'161'528'530 €
Water consumption	7'840'387'243 €	10'870'518'647 €	14'215'875'585 €	8'697'843'842 €	10'529'176'591 €	12'342'584'548 €
Group Employess	12'995'365'818 €	18'886'855'663 €	19'392'146'725 €	7'622'461'280 €	10'069'775'545 €	11'055'794'645 €
Lost Time Injuries	6'630'450'068 €	7'826'442'018 €	6'836'698'705 €	7'728'584'177 €	10'931'778'101 €	11'970'269'332 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1'917'626'211 €	329'684'444 €	-1'765'037'159 €	1'653'438'827 €	1'148'929'170 €	-381'475'328 €
Pension funding	-2'065'086'911 €	-2'143'069'948 €	3'312'996'525 €	-1'699'025'453 €	-840'911'968 €	785'076'532 €
CO2 Emissions	-6'836'322'480 €	-11'159'737'534 €	-13'987'523'153 €	-1'787'325'484 €	-3'193'038'813 €	-4'426'654'035 €
NOx Emissions	2'451'828'750 €	2'330'277'803 €	9'531'593'447 €	1'928'546'968 €	1'043'545'680 €	9'153'435'295 €
SOx Emissions	3'472'313'008 €	3'105'343'292 €	1'419'597'278 €	5'539'627'579 €	5'786'011'466 €	4'945'471'470 €
Water consumption	460'612'757 €	-1'196'518'647 €	-4'108'875'585 €	-396'843'842 €	-855'176'591 €	-2'235'584'548 €
Group Employess	-4'694'365'818 €	-9'212'855'663 €	-9'285'146'725 €	678'538'720 €	-395'775'545 €	-948'794'645 €
Lost Time Injuries	1'670'549'932 €	1'847'557'982 €	3'270'301'295 €	572'415'823 €	-1'257'778'101 €	-1'863'269'332 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.3 €	1.0 €	0.9 €	1.25 €	1.13 €	0.96 €
Pension funding	0.8 €	0.8 €	1.5 €	0.83 €	0.92 €	1.08 €
CO2 Emissions	0.5 €	0.5 €	0.4 €	0.82 €	0.75 €	0.70 €
NOx Emissions	1.4 €	1.3 €	17.6 €	1.30 €	1.12 €	10.60 €
SOx Emissions	1.7 €	1.5 €	1.2 €	3.01 €	2.49 €	1.96 €
Water consumption	1.1 €	0.9 €	0.7 €	0.95 €	0.92 €	0.82 €
Group Employess	0.6 €	0.5 €	0.5 €	1.09 €	0.96 €	0.91 €
Lost Time Injuries	1.3 €	1.2 €	1.5 €	1.07 €	0.88 €	0.84 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-452'855'569 €	-2'012'414'784 €	-1'451'511'760 €	811'171'642 €	179'475'662 €	628'525'676 €
Return to Costs	0.95	0.83	0.87	1.11	1.02	1.07



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BASF **Chemicals**

Performance Data	2004	2005	2006
Value	10'205'600'000 €	11'470'400'000 €	13'595'800'000 €
Capital employed	26'973'400'000 €	27'285'100'000 €	31'310'700'000 €
Pension funding	3'595'700'000 €	5'703'200'000 €	1'678'200'000 €
CO2 Emissions	20'700'000 €	19'700'000 €	20'300'000 €
NOx Emissions	15'000 t	16'000 t	16'100 t
SOx Emissions	6'300 t	7'700 t	7'000 t
Water consumption	1'985'000'000 t	2'035'000'000 t	1'980'000'000 t
Group Employess	81'955	80'950	95'250
Lost Time Injuries	246	228	251

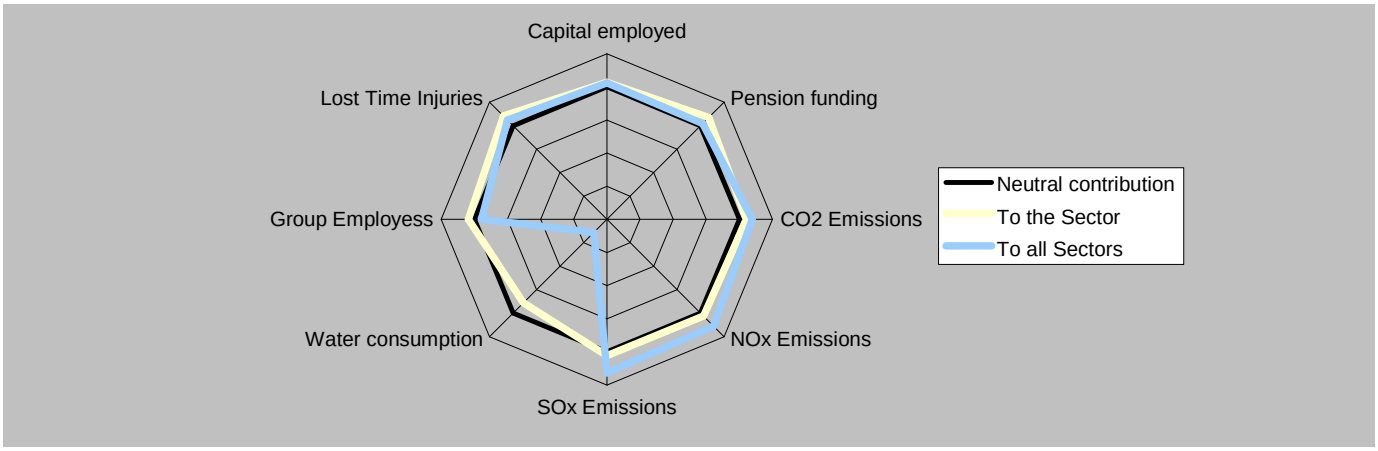
Performance 2006	
To all sectors	
SV Contribution	**-4'095'789'779 €**
Return to cost	**0.768**
To Chemicals	
To all sectors	**2'681'722'524 €**
Return to cost	**1.246**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	8'222'209'759 €	9'859'264'671 €	11'261'907'894 €	8'874'502'844 €	9'711'986'300 €	10'797'560'851 €
Pension funding	20'672'955'465 €	43'962'891'928 €	11'964'004'860 €	10'327'878'528 €	14'442'090'781 €	6'596'567'367 €
CO2 Emissions	4'305'782'752 €	5'744'382'340 €	5'749'942'044 €	10'755'846'257 €	11'906'461'732 €	9'342'378'121 €
NOx Emissions	1'683'553'881 €	2'250'431'992 €	2'450'805'690 €	8'071'329'811 €	9'039'518'808 €	11'019'286'310 €
SOx Emissions	553'793'872 €	943'878'189 €	963'279'250 €	8'346'298'522 €	10'038'612'000 €	11'412'166'105 €
Water consumption	56'853'538'889 €	80'487'275'741 €	82'639'454'558 €	18'315'366'369 €	21'489'128'323 €	22'562'430'975 €
Group Employess	11'258'181'263 €	15'649'633'716 €	17'771'703'234 €	7'520'071'008 €	8'758'594'067 €	10'165'665'745 €
Lost Time Injuries	6'063'303'847 €	7'435'388'383 €	8'731'620'701 €	4'412'967'804 €	5'025'298'985 €	5'416'564'335 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1'983'390'241 €	1'611'135'329 €	2'333'892'106 €	1'331'097'156 €	1'758'413'700 €	2'798'239'149 €
Pension funding	-10'467'355'465 €	-32'492'491'928 €	1'631'795'140 €	-122'278'528 €	-2'971'690'781 €	6'999'232'633 €
CO2 Emissions	5'899'817'248 €	5'726'017'660 €	7'845'857'956 €	-550'246'257 €	-436'061'732 €	4'253'421'879 €
NOx Emissions	8'522'046'119 €	9'219'968'008 €	11'144'994'310 €	2'134'270'189 €	2'430'881'192 €	2'576'513'690 €
SOx Emissions	9'651'806'128 €	10'526'521'811 €	12'632'520'750 €	1'859'301'478 €	1'431'788'000 €	2'183'633'895 €
Water consumption	-46'647'938'889 €	-69'016'875'741 €	-69'043'654'558 €	-8'109'766'369 €	-10'018'728'323 €	-8'966'630'975 €
Group Employess	-1'052'581'263 €	-4'179'233'716 €	-4'175'903'234 €	2'685'528'992 €	2'711'805'933 €	3'430'134'255 €
Lost Time Injuries	4'142'296'153 €	4'035'011'617 €	4'864'179'299 €	5'792'632'196 €	6'445'101'015 €	8'179'235'665 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.2 €	1.2 €	1.2 €	1.15 €	1.18 €	1.26 €
Pension funding	0.5 €	0.3 €	1.1 €	0.99 €	0.79 €	2.06 €
CO2 Emissions	2.4 €	2.0 €	2.4 €	0.95 €	0.96 €	1.46 €
NOx Emissions	6.1 €	5.1 €	5.5 €	1.26 €	1.27 €	1.23 €
SOx Emissions	18.4 €	12.2 €	14.1 €	1.22 €	1.14 €	1.19 €
Water consumption	0.2 €	0.1 €	0.2 €	0.56 €	0.53 €	0.60 €
Group Employess	0.9 €	0.7 €	0.8 €	1.36 €	1.31 €	1.34 €
Lost Time Injuries	1.7 €	1.5 €	1.6 €	2.31 €	2.28 €	2.51 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-3'496'064'966 €	-9'321'243'370 €	-4'095'789'779 €	627'567'357 €	168'938'625 €	2'681'722'524 €
Return to Costs	0.74	0.55	0.77	1.07	1.01	1.25



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Bayer **Chemicals**

Performance Data	2004	2005	2006
Value	7'837'000'000 €	8'276'000'000 €	10'244'000'000 €
Capital employed	26'238'000'000 €	27'652'000'000 €	40'376'000'000 €
Pension funding	1'928'000'000 €	1'585'000'000 €	1'515'000'000 €
CO2 Emissions	4'200'000 €	3'800'000 €	3'800'000 €
NOx Emissions	4'300 t	4'300 t	4'000 t
SOx Emissions	4'200 t	4'500 t	3'800 t
Water consumption	474'500'000 t	438'000'000 t	474'500'000 t
Group Employess	91'700	82'600	106'000
Lost Time Injuries	391	352	469

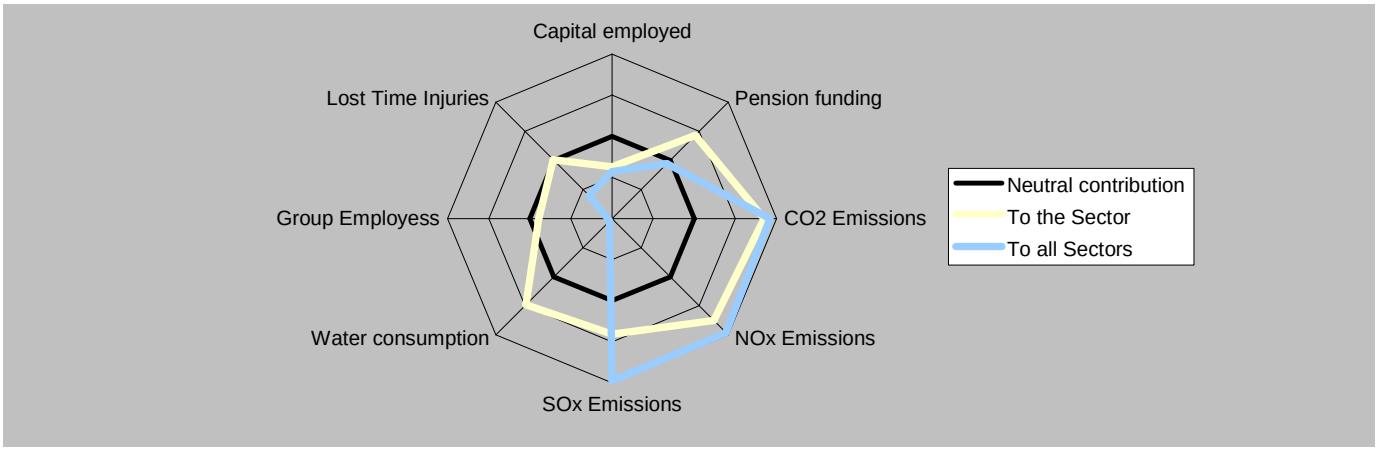
Performance 2006	
To all sectors	
SV Contribution	**-181'629'456 €**
Return to cost	**0.983**
To Chemicals	
To all sectors	**3'070'608'271 €**
Return to cost	**1.428**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	7'998'040'279 €	9'991'841'213 €	14'522'536'805 €	8'632'549'312 €	9'842'582'405 €	13'923'748'652 €
Pension funding	11'084'756'275 €	12'217'909'894 €	10'800'540'676 €	5'537'767'278 €	4'013'661'433 €	5'955'070'648 €
CO2 Emissions	873'637'080 €	1'108'053'446 €	1'076'343'831 €	2'182'345'617 €	2'296'677'898 €	1'748'819'550 €
NOx Emissions	482'618'779 €	604'803'598 €	608'895'824 €	2'313'781'213 €	2'429'370'680 €	2'737'710'884 €
SOx Emissions	369'195'914 €	551'617'124 €	522'923'021 €	5'564'199'014 €	5'866'721'298 €	6'195'175'886 €
Water consumption	13'590'430'329 €	17'323'551'240 €	19'804'253'125 €	4'378'156'847 €	4'625'178'479 €	5'407'006'817 €
Group Employess	12'596'854'637 €	15'968'619'456 €	19'777'433'520 €	8'414'257'964 €	8'937'120'074 €	11'312'971'853 €
Lost Time Injuries	9'640'806'729 €	11'508'285'161 €	16'292'108'847 €	7'016'730'611 €	7'778'016'528 €	10'106'629'541 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-161'040'279 €	-1'715'841'213 €	-4'278'536'805 €	-795'549'312 €	-1'566'582'405 €	-3'679'748'652 €
Pension funding	-3'247'756'275 €	-3'941'909'894 €	-556'540'676 €	2'299'232'722 €	4'262'338'567 €	4'288'929'352 €
CO2 Emissions	6'963'362'920 €	7'167'946'554 €	9'167'656'169 €	5'654'654'383 €	5'979'322'102 €	8'495'180'450 €
NOx Emissions	7'354'381'221 €	7'671'196'402 €	9'635'104'176 €	5'523'218'787 €	5'846'629'320 €	7'506'289'116 €
SOx Emissions	7'467'804'086 €	7'724'382'876 €	9'721'076'979 €	2'272'800'986 €	2'409'278'702 €	4'048'824'114 €
Water consumption	-5'753'430'329 €	-9'047'551'240 €	-9'560'253'125 €	3'458'843'153 €	3'650'821'521 €	4'836'993'183 €
Group Employess	-4'759'854'637 €	-7'692'619'456 €	-9'533'433'520 €	-577'257'964 €	-661'120'074 €	-1'068'971'853 €
Lost Time Injuries	-1'803'806'729 €	-3'232'285'161 €	-6'048'108'847 €	820'269'389 €	497'983'472 €	137'370'459 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.0 €	0.8 €	0.7 €	0.91 €	0.84 €	0.74 €
Pension funding	0.7 €	0.7 €	0.9 €	1.42 €	2.06 €	1.72 €
CO2 Emissions	9.0 €	7.5 €	9.5 €	3.59 €	3.60 €	5.86 €
NOx Emissions	16.2 €	13.7 €	16.8 €	3.39 €	3.41 €	3.74 €
SOx Emissions	21.2 €	15.0 €	19.6 €	1.41 €	1.41 €	1.65 €
Water consumption	0.6 €	0.5 €	0.5 €	1.79 €	1.79 €	1.89 €
Group Employess	0.6 €	0.5 €	0.5 €	0.93 €	0.93 €	0.91 €
Lost Time Injuries	0.8 €	0.7 €	0.6 €	1.12 €	1.06 €	1.01 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	757'457'497 €	-383'335'141 €	-181'629'456 €	2'332'026'518 €	2'552'333'901 €	3'070'608'271 €
Return to Costs	1.11	0.96	0.98	1.42	1.45	1.43



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BHP Biliton — Mining

Performance Data	2004	2005	2006
Value	8'794'504'358 €	15'054'298'260 €	16'595'438'357 €
Capital employed	25'405'525'188 €	33'486'742'104 €	36'310'525'119 €
Pension funding	228'985'079 €	437'426'110 €	303'099'189 €
CO2 Emissions	44'450'000 €	42'890'000 €	44'220'000 €
NOx Emissions	57'120 t	165'100 t	63'690 t
SOx Emissions	50'480 t	93'390 t	76'820 t
Water consumption	153'170'000 t	203'250'000 t	187'270'000 t
Group Employess	34'201	33'184	33'861
Lost Time Injuries	270	204	257

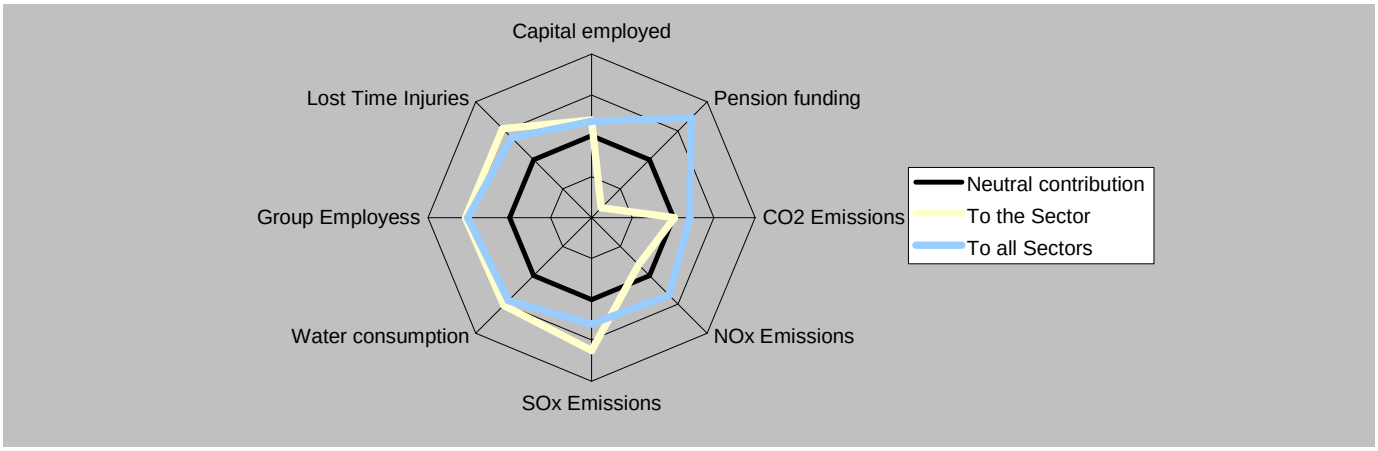
Performance 2006	
To all sectors	
SV Contribution	**7'711'878'640 €**
Return to cost	**1.868**
To Mining	
To all sectors	**3'557'186'272 €**
Return to cost	**1.273**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	7'744'279'814 €	12'100'181'175 €	13'060'257'020 €	7'104'077'925 €	12'031'603'838 €	12'743'829'209 €
Pension funding	1'316'516'489 €	3'371'881'894 €	2'160'815'262 €	8'272'847'513 €	19'472'948'980 €	33'226'209'769 €
CO2 Emissions	9'245'992'432 €	12'506'424'293 €	12'525'243'212 €	9'722'928'579 €	14'666'535'004 €	16'245'662'931 €
NOx Emissions	6'410'973'180 €	23'221'645'114 €	9'695'143'752 €	10'337'306'875 €	23'557'468'074 €	20'228'615'249 €
SOx Emissions	4'437'383'275 €	11'447'894'038 €	10'571'301'712 €	1'506'130'376 €	3'901'166'011 €	4'096'884'451 €
Water consumption	4'387'031'008 €	8'038'839'702 €	7'816'106'391 €	2'992'583'223 €	5'824'699'819 €	6'192'955'650 €
Group Employess	4'698'200'932 €	6'415'286'538 €	6'317'770'532 €	3'412'857'904 €	5'534'749'584 €	5'744'208'336 €
Lost Time Injuries	6'658'694'433 €	6'678'211'127 €	8'921'839'854 €	4'176'739'435 €	5'074'604'444 €	5'827'651'083 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1'050'224'544 €	2'954'117'086 €	3'535'181'337 €	1'690'426'433 €	3'022'694'422 €	3'851'609'148 €
Pension funding	7'477'987'869 €	11'682'416'366 €	14'434'623'095 €	521'656'845 €	-4'418'650'720 €	-16'630'771'412 €
CO2 Emissions	-451'488'074 €	2'547'873'968 €	4'070'195'145 €	-928'424'221 €	387'763'257 €	349'775'427 €
NOx Emissions	2'383'531'178 €	-8'167'346'854 €	6'900'294'605 €	-1'542'802'517 €	-8'503'169'814 €	-3'633'176'892 €
SOx Emissions	4'357'121'083 €	3'606'404'222 €	6'024'136'645 €	7'288'373'982 €	11'153'132'249 €	12'498'553'907 €
Water consumption	4'407'473'350 €	7'015'458'558 €	8'779'331'966 €	5'801'921'135 €	9'229'598'442 €	10'402'482'707 €
Group Employess	4'096'303'426 €	8'639'011'723 €	10'277'667'825 €	5'381'646'454 €	9'519'548'677 €	10'851'230'021 €
Lost Time Injuries	2'135'809'925 €	8'376'087'133 €	7'673'598'503 €	4'617'764'923 €	9'979'693'816 €	10'767'787'274 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.1 €	1.2 €	1.3 €	1.24 €	1.25 €	1.30 €
Pension funding	6.7 €	4.5 €	7.7 €	1.06 €	0.77 €	0.50 €
CO2 Emissions	1.0 €	1.2 €	1.3 €	0.90 €	1.03 €	1.02 €
NOx Emissions	1.4 €	0.6 €	1.7 €	0.85 €	0.64 €	0.82 €
SOx Emissions	2.0 €	1.3 €	1.6 €	5.84 €	3.86 €	4.05 €
Water consumption	2.0 €	1.9 €	2.1 €	2.94 €	2.58 €	2.68 €
Group Employess	1.9 €	2.3 €	2.6 €	2.58 €	2.72 €	2.89 €
Lost Time Injuries	1.3 €	2.3 €	1.9 €	2.11 €	2.97 €	2.85 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	3'182'120'413 €	4'581'752'775 €	7'711'878'640 €	2'853'820'379 €	3'796'326'291 €	3'557'186'272 €
Return to Costs	1.57	1.44	1.87	1.48	1.34	1.27



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BP — **Oil & Gas Producers**

Performance Data	2004	2005	2006
Value	25'732'530'654 €	36'786'438'102 €	34'699'325'604 €
Capital employed	97'136'947'850 €	114'353'149'806 €	107'829'809'805 €
Pension funding	5'546'922'713 €	6'875'527'782 €	4'507'084'944 €
CO2 Emissions	86'700'000 €	87'100'000 €	69'400'000 €
NOx Emissions	215'000 t	218'000 t	196'000 t
SOx Emissions	126'000 t	124'000 t	106'000 t
Water consumption	493'000'000 t	479'000'000 t	342'000'000 t
Group Employess	102'900	96'200	97'000
Lost Time Injuries	431	403	360

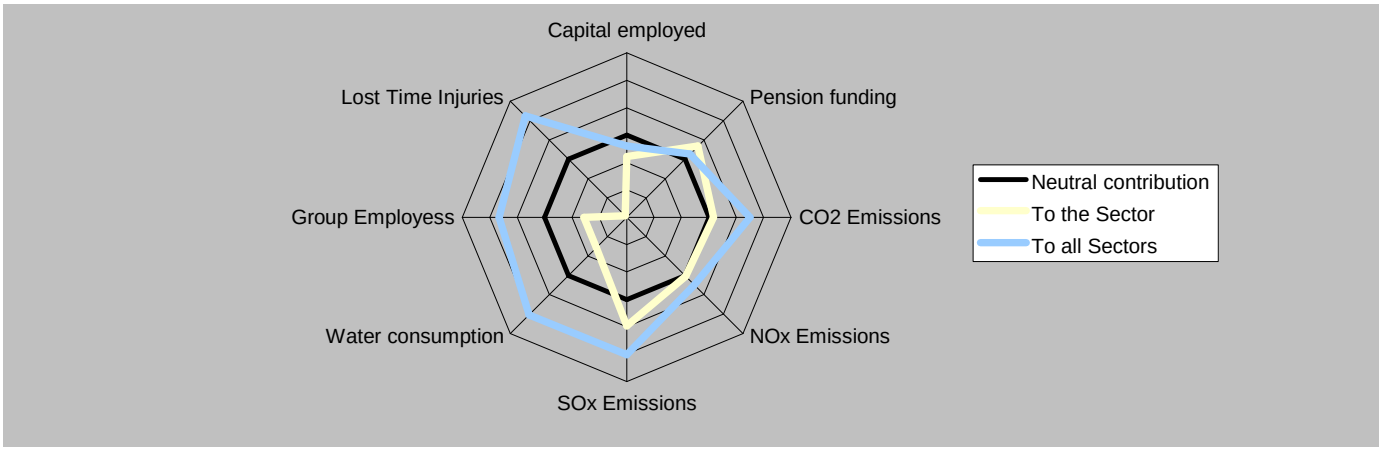
Performance 2006	
To all sectors	
SV Contribution	**12'214'200'237 €**
Return to cost	**1.543**
To Oil & Gas Producers	
To all sectors	**-5'923'499'720 €**
Return to cost	**0.854**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	29'609'925'355 €	41'320'646'429 €	38'784'485'376 €	30'407'854'132 €	44'762'203'613 €	42'522'198'351 €
Pension funding	31'891'227'358 €	52'999'734'333 €	32'131'322'947 €	33'613'909'060 €	72'901'482'346 €	28'024'838'676 €
CO2 Emissions	18'034'365'441 €	25'397'751'361 €	19'657'437'334 €	26'674'945'887 €	39'775'749'091 €	33'022'022'123 €
NOx Emissions	24'130'938'966 €	30'662'135'887 €	29'835'895'359 €	26'208'280'377 €	38'878'505'651 €	34'394'812'722 €
SOx Emissions	11'075'877'430 €	15'200'116'294 €	14'586'800'072 €	18'217'075'488 €	27'939'958'312 €	25'027'444'570 €
Water consumption	14'120'299'583 €	18'945'162'201 €	14'274'087'606 €	35'710'636'022 €	55'582'474'050 €	49'016'563'388 €
Group Employess	14'135'401'769 €	18'597'835'250 €	18'098'217'466 €	33'823'766'967 €	48'860'871'246 €	49'015'351'044 €
Lost Time Injuries	10'617'970'770 €	13'154'906'000 €	12'512'756'778 €	46'596'679'575 €	58'984'142'468 €	63'959'371'719 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-3'877'394'700 €	-4'534'208'327 €	-4'085'159'772 €	-4'675'323'478 €	-7'975'765'511 €	-7'822'872'747 €
Pension funding	-6'158'696'704 €	-16'213'296'231 €	2'568'002'657 €	-7'881'378'405 €	-36'115'044'244 €	6'674'486'928 €
CO2 Emissions	7'698'165'214 €	11'388'686'741 €	15'041'888'270 €	-942'415'233 €	-2'989'310'989 €	1'677'303'481 €
NOx Emissions	1'601'591'688 €	6'124'302'215 €	4'863'430'245 €	-475'749'723 €	-2'092'067'549 €	304'512'882 €
SOx Emissions	14'656'653'224 €	21'586'321'808 €	20'112'525'532 €	7'515'455'166 €	8'846'479'790 €	9'671'881'034 €
Water consumption	11'612'231'071 €	17'841'275'900 €	20'425'237'999 €	-9'978'105'368 €	-18'796'035'948 €	-14'317'237'783 €
Group Employess	11'597'128'886 €	18'188'602'851 €	16'601'108'138 €	-8'091'236'313 €	-12'074'433'145 €	-14'316'025'440 €
Lost Time Injuries	15'114'559'884 €	23'631'532'102 €	22'186'568'827 €	-20'864'148'921 €	-22'197'704'366 €	-29'260'046'114 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.9 €	0.9 €	0.9 €	0.85 €	0.82 €	0.82 €
Pension funding	0.8 €	0.7 €	1.1 €	0.77 €	0.50 €	1.24 €
CO2 Emissions	1.4 €	1.4 €	1.8 €	0.96 €	0.92 €	1.05 €
NOx Emissions	1.1 €	1.2 €	1.2 €	0.98 €	0.95 €	1.01 €
SOx Emissions	2.3 €	2.4 €	2.4 €	1.41 €	1.32 €	1.39 €
Water consumption	1.8 €	1.9 €	2.4 €	0.72 €	0.66 €	0.71 €
Group Employess	1.8 €	2.0 €	1.9 €	0.76 €	0.75 €	0.71 €
Lost Time Injuries	2.4 €	2.8 €	2.8 €	0.55 €	0.62 €	0.54 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	6'530'529'821 €	9'751'652'132 €	12'214'200'237 €	-5'674'112'784 €	-11'674'235'245 €	-5'923'499'720 €
Return to Costs	1.34	1.36	1.54	0.82	0.76	0.85



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Cemex — **Construction & Materials**

Performance Data	2004	2005	2006
Value	1'482'579'668 €	2'794'590'671 €	2'645'305'012 €
Capital employed	8'796'914'247 €	13'252'747'777 €	12'829'144'812 €
Pension funding	70'450'072 €	460'227'769 €	563'276'583 €
CO2 Emissions	49'850'000 €	53'110'000 €	56'370'000 €
NOx Emissions	55'076 t	116'700 t	127'600 t
SOx Emissions	15'216 t	34'540 t	33'000 t
Water consumption	64'856'269 t	147'147'586 t	129'308'784 t
Group Employess	26'679	52'674	54'635
Lost Time Injuries	474	969	938

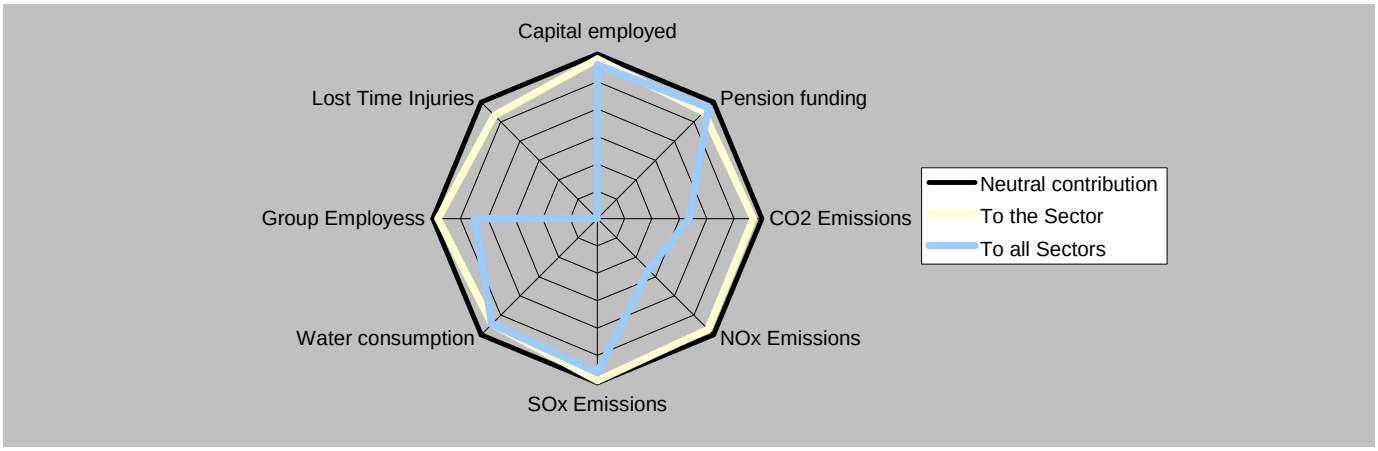
Performance 2006	
To all sectors	
SV Contribution	**-9'449'330'280 €**
Return to cost	**0.219**
To Construction & Materials	
To all sectors	**-1'744'685'744 €**
Return to cost	**0.603**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	2'681'533'443 €	4'788'780'248 €	4'614'417'667 €	2'101'851'173 €	3'345'770'390 €	3'567'520'237 €
Pension funding	405'042'467 €	3'547'647'582 €	4'015'638'048 €	628'668'167 €	3'166'363'930 €	5'162'010'095 €
CO2 Emissions	10'369'240'106 €	15'486'504'877 €	15'966'710'987 €	2'780'741'477 €	3'828'886'998 €	4'185'208'453 €
NOx Emissions	6'181'591'300 €	16'414'088'339 €	19'423'776'775 €	1'571'463'950 €	3'797'615'335 €	4'108'290'745 €
SOx Emissions	1'337'578'085 €	4'233'967'877 €	4'541'173'607 €	1'062'308'159 €	2'790'250'279 €	3'083'936'490 €
Water consumption	1'857'586'102 €	5'819'905'801 €	5'396'973'431 €	2'479'190'070 €	5'373'574'332 €	5'378'087'083 €
Group Employess	3'664'901'689 €	10'183'184'761 €	10'193'774'343 €	1'532'228'903 €	3'440'556'949 €	3'577'704'564 €
Lost Time Injuries	11'697'721'728 €	31'663'100'899 €	32'604'617'478 €	2'192'010'191 €	4'811'512'831 €	6'057'168'382 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-1'198'953'775 €	-1'994'189'577 €	-1'969'112'655 €	-619'271'505 €	-551'179'720 €	-922'215'225 €
Pension funding	1'077'537'200 €	-753'056'911 €	-1'370'333'036 €	853'911'500 €	-371'773'260 €	-2'516'705'083 €
CO2 Emissions	-8'886'660'439 €	-12'691'914'206 €	-13'321'405'975 €	-1'298'161'810 €	-1'034'296'327 €	-1'539'903'441 €
NOx Emissions	-4'699'011'632 €	-13'619'497'669 €	-16'778'471'762 €	-88'884'282 €	-1'003'024'664 €	-1'462'985'733 €
SOx Emissions	145'001'583 €	-1'439'377'207 €	-1'895'868'595 €	420'271'509 €	4'340'392 €	-438'631'478 €
Water consumption	-375'006'434 €	-3'025'315'130 €	-2'751'668'419 €	-996'610'403 €	-2'578'983'661 €	-2'732'782'071 €
Group Employess	-2'182'322'021 €	-7'388'594'090 €	-7'548'469'331 €	-49'649'236 €	-645'966'278 €	-932'399'552 €
Lost Time Injuries	-10'215'142'061 €	-28'868'510'228 €	-29'959'312'466 €	-709'430'523 €	-2'016'922'161 €	-3'411'863'370 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.6 €	0.6 €	0.6 €	0.71 €	0.84 €	0.74 €
Pension funding	3.7 €	0.8 €	0.7 €	2.36 €	0.88 €	0.51 €
CO2 Emissions	0.1 €	0.2 €	0.2 €	0.53 €	0.73 €	0.63 €
NOx Emissions	0.2 €	0.2 €	0.1 €	0.94 €	0.74 €	0.64 €
SOx Emissions	1.1 €	0.7 €	0.6 €	1.40 €	1.00 €	0.86 €
Water consumption	0.8 €	0.5 €	0.5 €	0.60 €	0.52 €	0.49 €
Group Employess	0.4 €	0.3 €	0.3 €	0.97 €	0.81 €	0.74 €
Lost Time Injuries	0.1 €	0.1 €	0.1 €	0.68 €	0.58 €	0.44 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-3'291'819'698 €	-8'722'556'877 €	-9'449'330'280 €	-310'978'094 €	-1'024'725'710 €	-1'744'685'744 €
Return to Costs	0.31	0.24	0.22	0.83	0.73	0.60



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CRH — **Construction & Materials**

Performance Data	2004	2005	2006
Value	4'042'300'000 €	4'516'900'000 €	5'539'700'000 €
Capital employed	10'487'500'000 €	12'829'400'000 €	14'516'600'000 €
Pension funding	0 €	450'500'000 €	261'400'000 €
CO2 Emissions	11'200'000 €	11'300'000 €	12'100'000 €
NOx Emissions	25'000 t	24'200 t	25'100 t
SOx Emissions	5'500 t	6'000 t	8'000 t
Water consumption	31'000'000 t	34'000'000 t	42'000'000 t
Group Employess	63'493	66'466	79'560
Lost Time Injuries	1'153	1'155	1'156

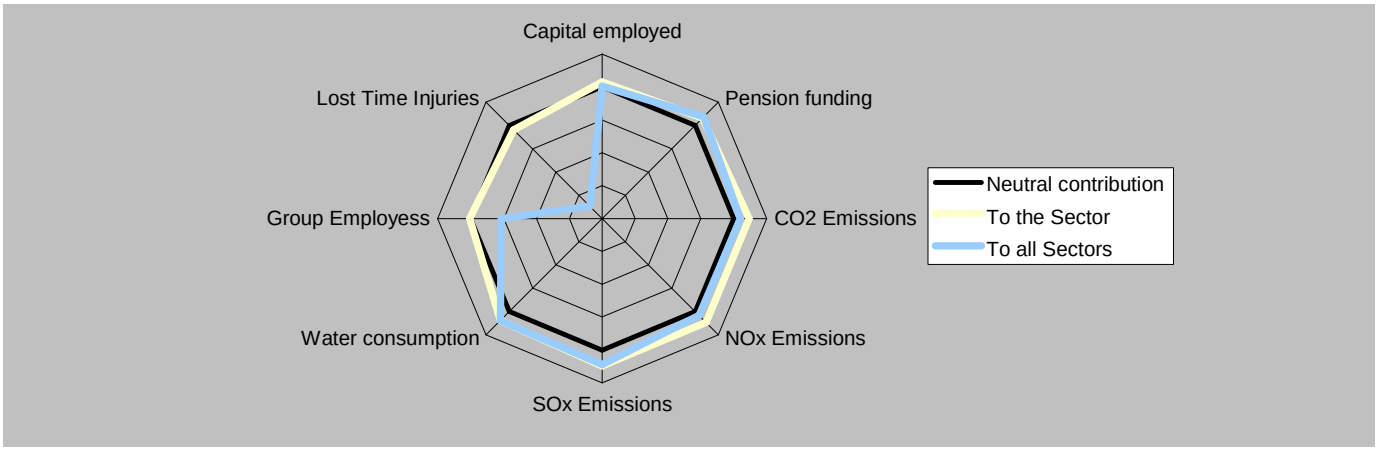
Performance 2006	
To all sectors	
SV Contribution	**-3'486'532'685 €**
Return to cost	**0.614**
To Construction & Materials	
To all sectors	**2'626'275'650 €**
Return to cost	**1.901**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	3'196'868'947 €	4'635'806'729 €	5'221'365'608 €	2'505'783'682 €	3'238'892'596 €	4'036'766'677 €
Pension funding	0 €	3'472'661'456 €	1'863'538'834 €	0 €	3'099'436'943 €	2'395'536'191 €
CO2 Emissions	2'329'698'880 €	3'295'001'038 €	3'427'305'357 €	624'760'372 €	814'656'808 €	898'368'321 €
NOx Emissions	2'805'923'136 €	3'403'778'387 €	3'820'821'293 €	713'312'615 €	787'508'921 €	808'135'562 €
SOx Emissions	483'470'840 €	735'489'498 €	1'100'890'571 €	383'973'858 €	484'698'948 €	747'620'967 €
Water consumption	887'889'020 €	1'344'750'553 €	1'752'958'127 €	1'185'003'290 €	1'241'620'965 €	1'746'823'767 €
Group Employess	8'722'051'161 €	12'849'518'895 €	14'844'269'914 €	3'646'531'344 €	4'341'421'919 €	5'209'886'979 €
Lost Time Injuries	28'431'774'422 €	37'727'587'197 €	40'178'711'775 €	5'327'767'297 €	5'733'069'874 €	7'464'256'336 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	845'431'053 €	-118'906'729 €	318'334'392 €	1'536'516'318 €	1'278'007'404 €	1'502'933'323 €
Pension funding	4'042'300'000 €	1'044'238'544 €	3'676'161'166 €	4'042'300'000 €	1'417'463'057 €	3'144'163'809 €
CO2 Emissions	1'712'601'120 €	1'221'898'962 €	2'112'394'643 €	3'417'539'628 €	3'702'243'192 €	4'641'331'679 €
NOx Emissions	1'236'376'864 €	1'113'121'613 €	1'718'878'707 €	3'328'987'385 €	3'729'391'079 €	4'731'564'438 €
SOx Emissions	3'558'829'160 €	3'781'410'502 €	4'438'809'429 €	3'658'326'142 €	4'032'201'052 €	4'792'079'033 €
Water consumption	3'154'410'980 €	3'172'149'447 €	3'786'741'873 €	2'857'296'710 €	3'275'279'035 €	3'792'876'233 €
Group Employess	-4'679'751'161 €	-8'332'618'895 €	-9'304'569'914 €	395'768'656 €	175'478'081 €	329'813'021 €
Lost Time Injuries	-24'389'474'422 €	-33'210'687'197 €	-34'639'011'775 €	-1'285'467'297 €	-1'216'169'874 €	-1'924'556'336 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.3 €	1.0 €	1.1 €	1.61 €	1.39 €	1.37 €
Pension funding	10.0 €	1.3 €	3.0 €	10.00 €	1.46 €	2.31 €
CO2 Emissions	1.7 €	1.4 €	1.6 €	6.47 €	5.54 €	6.17 €
NOx Emissions	1.4 €	1.3 €	1.4 €	5.67 €	5.74 €	6.85 €
SOx Emissions	8.4 €	6.1 €	5.0 €	10.53 €	9.32 €	7.41 €
Water consumption	4.6 €	3.4 €	3.2 €	3.41 €	3.64 €	3.17 €
Group Employess	0.5 €	0.4 €	0.4 €	1.11 €	1.04 €	1.06 €
Lost Time Injuries	0.1 €	0.1 €	0.1 €	0.76 €	0.79 €	0.74 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-1'814'909'551 €	-3'916'174'219 €	-3'486'532'685 €	2'243'908'443 €	2'049'236'628 €	2'626'275'650 €
Return to Costs	0.69	0.54	0.61	2.25	1.83	1.90



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DSM NV — **Chemicals**

Performance Data	2004	2005	2006
Value	1'903'378'230 €	2'097'272'871 €	2'194'142'805 €
Capital employed	7'172'000'000 €	7'778'000'000 €	7'681'000'000 €
Pension funding	0 €	0 €	0 €
CO2 Emissions	4'900'000 €	5'500'000 €	5'900'000 €
NOx Emissions	16'000 t	18'600 t	17'300 t
SOx Emissions	2'600 t	3'200 t	2'500 t
Water consumption	218'930'027 t	206'204'549 t	194'692'727 t
Group Employess	24'204	21'820	22'156
Lost Time Injuries	214	179	210

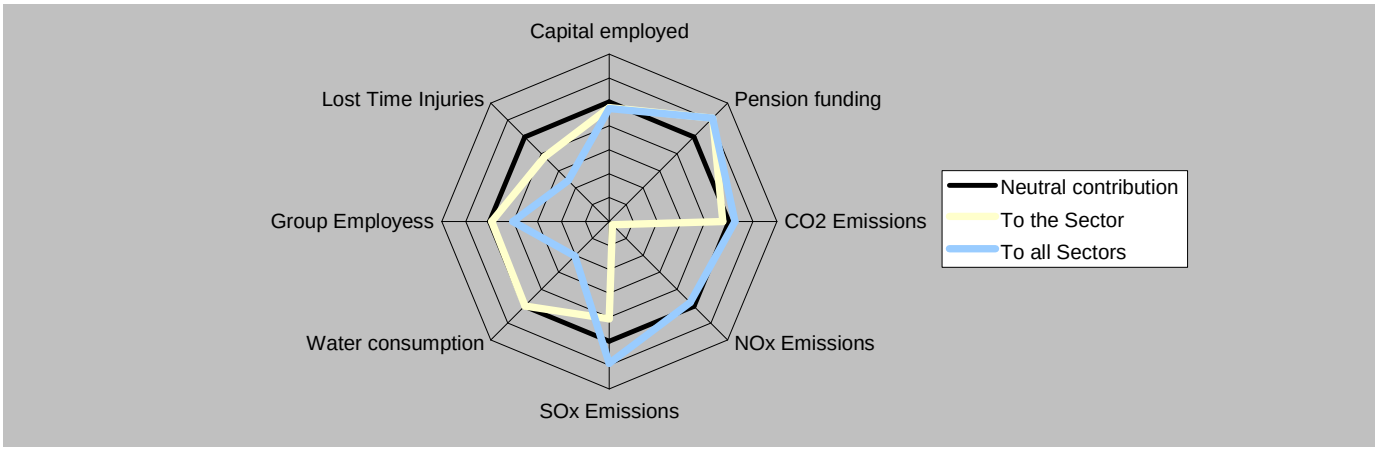
Performance 2006	
To all sectors	
SV Contribution	**-1'179'288'491 €**
Return to cost	**0.650**
To Chemicals	
To all sectors	**-1'606'134'489 €**
Return to cost	**0.577**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	2'186'216'361 €	2'810'521'516 €	2'762'720'557 €	2'359'655'601 €	2'768'537'753 €	2'648'809'030 €
Pension funding	0 €	0 €	0 €	0 €	0 €	0 €
CO2 Emissions	1'019'243'260 €	1'603'761'567 €	1'671'165'422 €	2'546'069'887 €	3'324'139'062 €	2'715'272'459 €
NOx Emissions	1'795'790'807 €	2'616'127'190 €	2'633'474'437 €	8'609'418'465 €	10'508'440'615 €	11'840'599'575 €
SOx Emissions	228'549'852 €	392'261'066 €	344'028'304 €	3'444'504'152 €	4'171'890'701 €	4'075'773'609 €
Water consumption	6'270'502'162 €	8'155'696'511 €	8'125'909'472 €	2'020'042'141 €	2'177'472'244 €	2'218'556'167 €
Group Employess	3'324'910'247 €	4'218'344'752 €	4'133'856'765 €	2'220'923'662 €	2'360'871'187 €	2'364'624'570 €
Lost Time Injuries	5'281'697'892 €	5'846'531'130 €	7'316'295'412 €	3'844'102'710 €	3'951'450'206 €	4'538'582'944 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-282'838'131 €	-713'248'644 €	-568'577'752 €	-456'277'372 €	-671'264'882 €	-454'666'225 €
Pension funding	1'903'378'230 €	2'097'272'871 €	2'194'142'805 €	1'903'378'230 €	2'097'272'871 €	2'194'142'805 €
CO2 Emissions	884'134'969 €	493'511'304 €	522'977'383 €	-642'691'657 €	-1'226'866'191 €	-521'129'654 €
NOx Emissions	107'587'423 €	-518'854'319 €	-439'331'632 €	-6'706'040'236 €	-8'411'167'743 €	-9'646'456'770 €
SOx Emissions	1'674'828'378 €	1'705'011'806 €	1'850'114'501 €	-1'541'125'922 €	-2'074'617'830 €	-1'881'630'804 €
Water consumption	-4'367'123'933 €	-6'058'423'640 €	-5'931'766'667 €	-116'663'911 €	-80'199'372 €	-24'413'362 €
Group Employess	-1'421'532'017 €	-2'121'071'881 €	-1'939'713'960 €	-317'545'432 €	-263'598'315 €	-170'481'765 €
Lost Time Injuries	-3'378'319'663 €	-3'749'258'259 €	-5'122'152'607 €	-1'940'724'481 €	-1'854'177'334 €	-2'344'440'139 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.9 €	0.7 €	0.8 €	0.81 €	0.76 €	0.83 €
Pension funding	10.0 €	10.0 €	10.0 €	10.00 €	10.00 €	10.00 €
CO2 Emissions	1.9 €	1.3 €	1.3 €	0.75 €	0.63 €	0.81 €
NOx Emissions	1.1 €	0.8 €	0.8 €	0.22 €	0.20 €	0.19 €
SOx Emissions	8.3 €	5.3 €	6.4 €	0.55 €	0.50 €	0.54 €
Water consumption	0.3 €	0.3 €	0.3 €	0.94 €	0.96 €	0.99 €
Group Employess	0.6 €	0.5 €	0.5 €	0.86 €	0.89 €	0.93 €
Lost Time Injuries	0.4 €	0.4 €	0.3 €	0.50 €	0.53 €	0.48 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-609'985'593 €	-1'108'132'595 €	-1'179'288'491 €	-1'227'211'348 €	-1'560'577'349 €	-1'606'134'489 €
Return to Costs	0.76	0.65	0.65	0.61	0.57	0.58



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Dupont De Nemours — **Chemicals**

Performance Data	2004	2005	2006
Value	4'581'348'883 €	6'499'278'860 €	5'677'510'845 €
Capital employed	20'455'754'173 €	21'833'305'185 €	18'062'438'433 €
Pension funding	0 €	0 €	712'283'095 €
CO2 Emissions	22'000'000 €	21'500'000 €	44'646'159 €
NOx Emissions	14'978 t	17'550 t	14'221 t
SOx Emissions	5'062 t	6'221 t	4'799 t
Water consumption	107'000'000 t	103'000'000 t	215'547'475 t
Group Employess	60'000	60'000	59'000
Lost Time Injuries	587	521	559

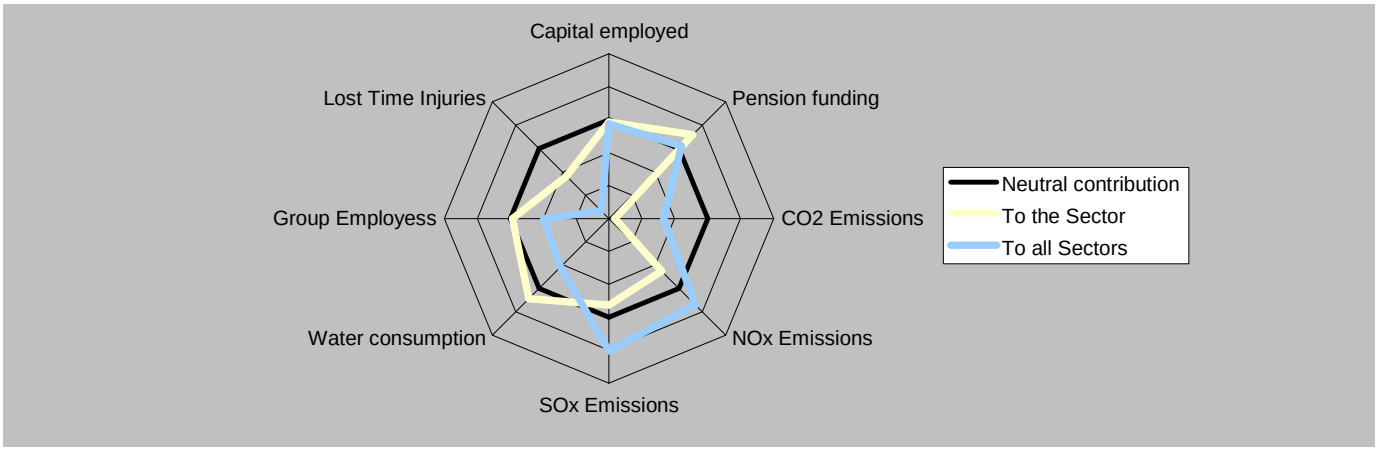
Performance 2006	
To all sectors	
SV Contribution	**-2'658'603'647 €**
Return to cost	**0.681**
To Chemicals	
To all sectors	**-2'634'969'351 €**
Return to cost	**0.683**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	6'044'910'087 €	7'720'784'056 €	6'348'920'924 €	6'384'392'359 €	7'460'348'595 €	5'995'516'022 €
Pension funding	0 €	0 €	5'138'838'735 €	0 €	0 €	2'694'909'759 €
CO2 Emissions	4'439'962'060 €	6'145'309'137 €	12'379'354'044 €	10'844'078'537 €	12'474'182'067 €	19'777'109'117 €
NOx Emissions	1'641'374'226 €	2'466'588'095 €	2'187'347'055 €	7'645'633'757 €	9'518'561'360 €	9'368'812'971 €
SOx Emissions	432'826'261 €	734'247'545 €	624'922'705 €	6'361'993'138 €	7'785'823'268 €	7'530'053'532 €
Water consumption	3'730'977'682 €	4'993'689'795 €	10'272'891'208 €	1'728'431'549 €	1'957'216'125 €	3'476'358'477 €
Group Employess	7'990'344'845 €	11'351'716'054 €	10'757'724'644 €	5'222'680'642 €	6'231'978'125 €	6'060'942'417 €
Lost Time Injuries	14'042'508'873 €	16'664'937'448 €	18'978'916'624 €	10'000'929'743 €	11'048'316'689 €	11'596'139'275 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-1'463'561'204 €	-1'221'505'196 €	-671'410'079 €	-1'803'043'475 €	-961'069'735 €	-318'005'177 €
Pension funding	4'581'348'883 €	6'499'278'860 €	538'672'110 €	4'581'348'883 €	6'499'278'860 €	2'982'601'086 €
CO2 Emissions	141'386'823 €	353'969'723 €	-6'701'843'199 €	-6'262'729'654 €	-5'974'903'207 €	-14'099'598'272 €
NOx Emissions	2'939'974'657 €	4'032'690'765 €	3'490'163'790 €	-3'064'284'874 €	-3'019'282'500 €	-3'691'302'126 €
SOx Emissions	4'148'522'622 €	5'765'031'315 €	5'052'588'140 €	-1'780'644'255 €	-1'286'544'408 €	-1'852'542'687 €
Water consumption	850'371'201 €	1'505'589'065 €	-4'595'380'364 €	2'852'917'335 €	4'542'062'735 €	2'201'152'368 €
Group Employess	-3'408'995'962 €	-4'852'437'194 €	-5'080'213'799 €	-641'331'758 €	267'300'735 €	-383'431'572 €
Lost Time Injuries	-9'461'159'990 €	-10'165'658'588 €	-13'301'405'779 €	-5'419'580'860 €	-4'549'037'829 €	-5'918'628'430 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.8 €	0.8 €	0.9 €	0.72 €	0.87 €	0.95 €
Pension funding	10.0 €	10.0 €	1.1 €	10.00 €	10.00 €	2.11 €
CO2 Emissions	1.0 €	1.1 €	0.5 €	0.42 €	0.52 €	0.29 €
NOx Emissions	2.8 €	2.6 €	2.6 €	0.60 €	0.68 €	0.61 €
SOx Emissions	10.6 €	8.9 €	9.1 €	0.72 €	0.83 €	0.75 €
Water consumption	1.2 €	1.3 €	0.6 €	2.65 €	3.32 €	1.63 €
Group Employess	0.6 €	0.6 €	0.5 €	0.88 €	1.04 €	0.94 €
Lost Time Injuries	0.3 €	0.4 €	0.3 €	0.46 €	0.59 €	0.49 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-209'014'121 €	239'619'844 €	-2'658'603'647 €	-1'442'168'582 €	-560'274'419 €	-2'634'969'351 €
Return to Costs	0.96	1.04	0.68	0.76	0.92	0.68



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Encana — **Oil & Gas Producers**

Performance Data	2004	2005	2006
Value	3'819'618'851 €	5'109'778'754 €	6'652'269'455 €
Capital employed	20'879'007'239 €	24'723'019'760 €	23'804'652'573 €
Pension funding	0 €	0 €	0 €
CO2 Emissions	5'559'624 €	6'107'050 €	8'584'478 €
NOx Emissions	277'000 t	315'000 t	350'000 t
SOx Emissions	5'800 t	7'000 t	6'800 t
Water consumption	260'566'855 t	248'430'183 t	206'226'057 t
Group Employess	6'421	6'685	6'574
Lost Time Injuries	14	18	18

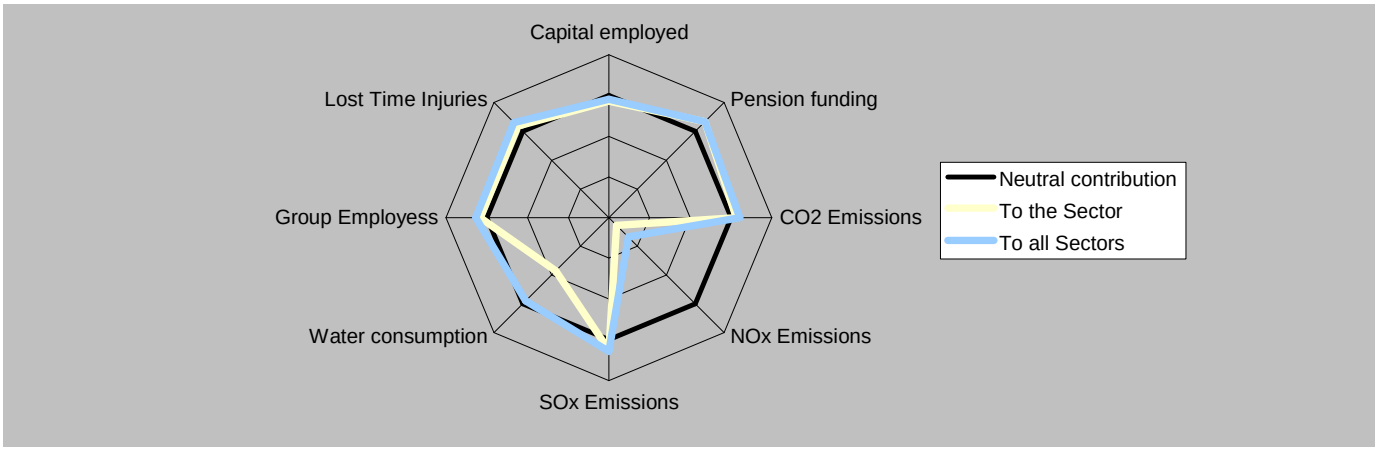
Performance 2006	
To all sectors	
SV Contribution	**-2'806'875'339 €**
Return to cost	**0.703**
To Oil & Gas Producers	
To all sectors	**-7'423'192'343 €**
Return to cost	**0.473**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	6'364'476'747 €	8'933'476'340 €	8'562'114'700 €	6'535'986'775 €	9'677'537'054 €	9'387'257'199 €
Pension funding	0 €	0 €	0 €	0 €	0 €	0 €
CO2 Emissions	1'156'450'925 €	1'780'773'105 €	2'431'539'531 €	1'710'526'824 €	2'788'891'946 €	4'084'680'563 €
NOx Emissions	31'089'628'342 €	44'305'379'836 €	53'278'384'570 €	33'766'017'044 €	56'177'657'248 €	61'419'308'433 €
SOx Emissions	509'841'977 €	858'071'081 €	935'756'986 €	838'563'792 €	1'577'255'711 €	1'605'534'180 €
Water consumption	7'463'046'772 €	9'825'783'133 €	8'607'277'188 €	18'874'255'842 €	28'827'482'721 €	29'556'995'832 €
Group Employess	882'054'565 €	1'292'375'558 €	1'226'574'037 €	2'110'616'207 €	3'395'373'433 €	3'321'926'987 €
Lost Time Injuries	337'533'370 €	603'679'271 €	631'511'342 €	1'481'256'128 €	2'706'785'144 €	3'227'991'191 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-2'544'857'896 €	-3'823'697'586 €	-1'909'845'244 €	-2'716'367'925 €	-4'567'758'300 €	-2'734'987'744 €
Pension funding	3'819'618'851 €	5'109'778'754 €	6'652'269'455 €	3'819'618'851 €	5'109'778'754 €	6'652'269'455 €
CO2 Emissions	2'663'167'926 €	3'329'005'649 €	4'220'729'924 €	2'109'092'027 €	2'320'886'808 €	2'567'588'893 €
NOx Emissions	-27'270'009'492 €	-39'195'601'083 €	-46'626'115'115 €	-29'946'398'194 €	-51'067'878'494 €	-54'767'038'978 €
SOx Emissions	3'309'776'874 €	4'251'707'672 €	5'716'512'469 €	2'981'055'058 €	3'532'523'042 €	5'046'735'275 €
Water consumption	-3'643'427'922 €	-4'716'004'379 €	-1'955'007'732 €	-15'054'636'992 €	-23'717'703'967 €	-22'904'726'377 €
Group Employess	2'937'564'285 €	3'817'403'196 €	5'425'695'418 €	1'709'002'644 €	1'714'405'320 €	3'330'342'468 €
Lost Time Injuries	3'482'085'481 €	4'506'099'483 €	6'020'758'113 €	2'338'362'722 €	2'402'993'610 €	3'424'278'264 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.6 €	0.6 €	0.8 €	0.58 €	0.53 €	0.71 €
Pension funding	10.0 €	10.0 €	10.0 €	10.00 €	10.00 €	10.00 €
CO2 Emissions	3.3 €	2.9 €	2.7 €	2.23 €	1.83 €	1.63 €
NOx Emissions	0.1 €	0.1 €	0.1 €	0.11 €	0.09 €	0.11 €
SOx Emissions	7.5 €	6.0 €	7.1 €	4.55 €	3.24 €	4.14 €
Water consumption	0.5 €	0.5 €	0.8 €	0.20 €	0.18 €	0.23 €
Group Employess	4.3 €	4.0 €	5.4 €	1.81 €	1.50 €	2.00 €
Lost Time Injuries	11.3 €	8.5 €	10.5 €	2.58 €	1.89 €	2.06 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-2'155'760'237 €	-3'340'163'537 €	-2'806'875'339 €	-4'345'033'976 €	-8'034'094'153 €	-7'423'192'343 €
Return to Costs	0.64	0.60	0.70	0.47	0.39	0.47



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Exxon Mobil — **Oil & Gas Producers**

Performance Data	2004	2005	2006
Value	39'137'981'977 €	60'852'052'018 €	60'766'840'949 €
Capital employed	112'479'686'808 €	136'824'860'665 €	128'967'189'513 €
Pension funding	7'716'058'502 €	8'526'431'346 €	10'960'066'682 €
CO2 Emissions	146'976'132 €	154'100'000 €	156'796'584 €
NOx Emissions	176'000 t	164'000 t	161'000 t
SOx Emissions	283'000 t	254'000 t	235'000 t
Water consumption	394'997'267 t	375'125'671 t	283'899'506 t
Group Employess	86'000	84'000	82'000
Lost Time Injuries	292	458	304

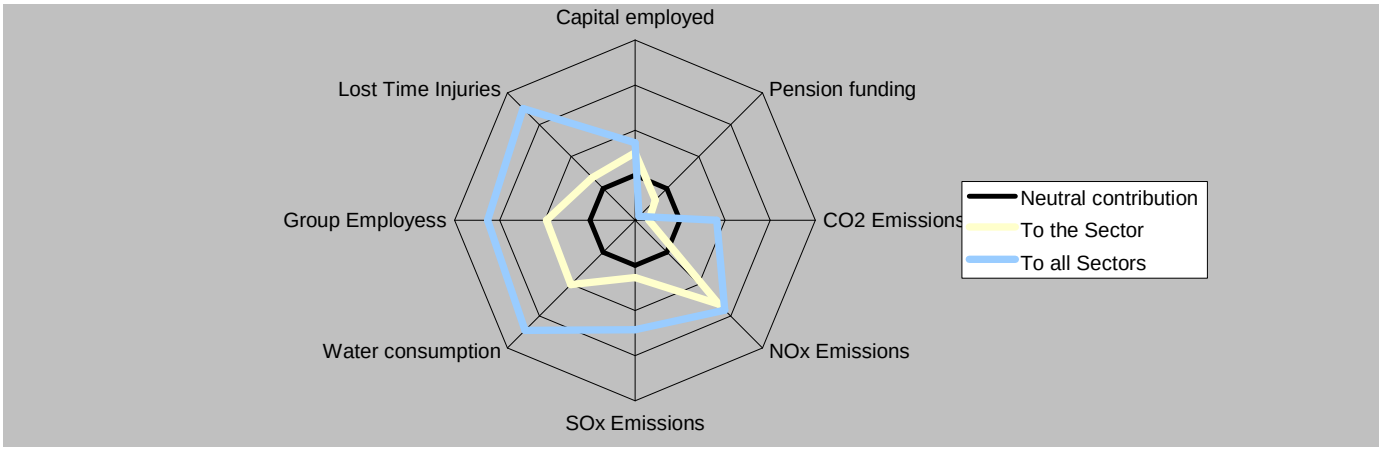
Performance 2006	
To all sectors	
SV Contribution	**27'828'357'935 €**
Return to cost	**1.845**
To Oil & Gas Producers	
To all sectors	**9'073'581'409 €**
Return to cost	**1.176**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	34'286'800'275 €	49'440'629'313 €	46'387'228'955 €	35'210'761'559 €	53'558'492'117 €	50'857'628'546 €
Pension funding	44'362'358'868 €	65'725'659'243 €	78'135'079'876 €	46'758'698'871 €	90'406'075'565 €	68'149'170'580 €
CO2 Emissions	30'572'333'091 €	44'934'483'177 €	44'412'377'828 €	45'220'073'505 €	70'372'479'161 €	74'607'208'369 €
NOx Emissions	19'753'698'875 €	23'066'927'915 €	24'508'056'902 €	21'454'220'216 €	29'248'050'123 €	28'252'881'879 €
SOx Emissions	24'876'772'323 €	31'135'722'086 €	32'338'660'537 €	40'916'129'866 €	57'231'850'091 €	55'485'372'396 €
Water consumption	11'313'346'345 €	14'836'778'031 €	11'849'141'577 €	28'611'772'090 €	43'529'045'627 €	40'689'409'735 €
Group Employess	11'813'844'044 €	16'239'274'023 €	15'299'524'044 €	28'268'648'777 €	42'664'378'219 €	41'435'657'584 €
Lost Time Injuries	7'199'746'210 €	14'954'268'853 €	10'577'794'389 €	31'595'892'893 €	67'052'149'559 €	54'068'747'226 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	4'851'181'701 €	11'411'422'706 €	14'379'611'994 €	3'927'220'418 €	7'293'559'901 €	9'909'212'403 €
Pension funding	-5'224'376'891 €	-4'873'607'225 €	-17'368'238'927 €	-7'620'716'894 €	-29'554'023'546 €	-7'382'329'631 €
CO2 Emissions	8'565'648'885 €	15'917'568'841 €	16'354'463'121 €	-6'082'091'529 €	-9'520'427'143 €	-13'840'367'420 €
NOx Emissions	19'384'283'102 €	37'785'124'103 €	36'258'784'047 €	17'683'761'761 €	31'604'001'896 €	32'513'959'070 €
SOx Emissions	14'261'209'653 €	29'716'329'932 €	28'428'180'412 €	-1'778'147'889 €	3'620'201'928 €	5'281'468'553 €
Water consumption	27'824'635'632 €	46'015'273'987 €	48'917'699'372 €	10'526'209'887 €	17'323'006'391 €	20'077'431'213 €
Group Employess	27'324'137'933 €	44'612'777'995 €	45'467'316'905 €	10'869'333'199 €	18'187'673'799 €	19'331'183'365 €
Lost Time Injuries	31'938'235'766 €	45'897'783'165 €	50'189'046'559 €	7'542'089'084 €	-6'200'097'541 €	6'698'093'723 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.1 €	1.2 €	1.3 €	1.11 €	1.14 €	1.19 €
Pension funding	0.9 €	0.9 €	0.8 €	0.84 €	0.67 €	0.89 €
CO2 Emissions	1.3 €	1.4 €	1.4 €	0.87 €	0.86 €	0.81 €
NOx Emissions	2.0 €	2.6 €	2.5 €	1.82 €	2.08 €	2.15 €
SOx Emissions	1.6 €	2.0 €	1.9 €	0.96 €	1.06 €	1.10 €
Water consumption	3.5 €	4.1 €	5.1 €	1.37 €	1.40 €	1.49 €
Group Employess	3.3 €	3.7 €	4.0 €	1.38 €	1.43 €	1.47 €
Lost Time Injuries	5.4 €	4.1 €	5.7 €	1.24 €	0.91 €	1.12 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	16'115'619'473 €	28'310'334'188 €	27'828'357'935 €	4'383'457'255 €	4'094'236'961 €	9'073'581'409 €
Return to Costs	1.70	1.87	1.84	1.13	1.07	1.18



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HeidelbergCement — **Construction & Materials**

Performance Data	2004	2005	2006
Value	1'480'500'000 €	2'516'100'000 €	3'226'000'000 €
Capital employed	9'065'000'000 €	9'533'000'000 €	9'404'000'000 €
Pension funding	29'700'000 €	92'300'000 €	75'700'000 €
CO2 Emissions	44'700'000 €	43'900'000 €	47'500'000 €
NOx Emissions	90'000 t	88'982 t	90'810 t
SOx Emissions	40'000 t	38'040 t	36'800 t
Water consumption	73'537'814 t	83'606'235 t	88'505'834 t
Group Employess	42'062	41'260	45'958
Lost Time Injuries	538	775	435

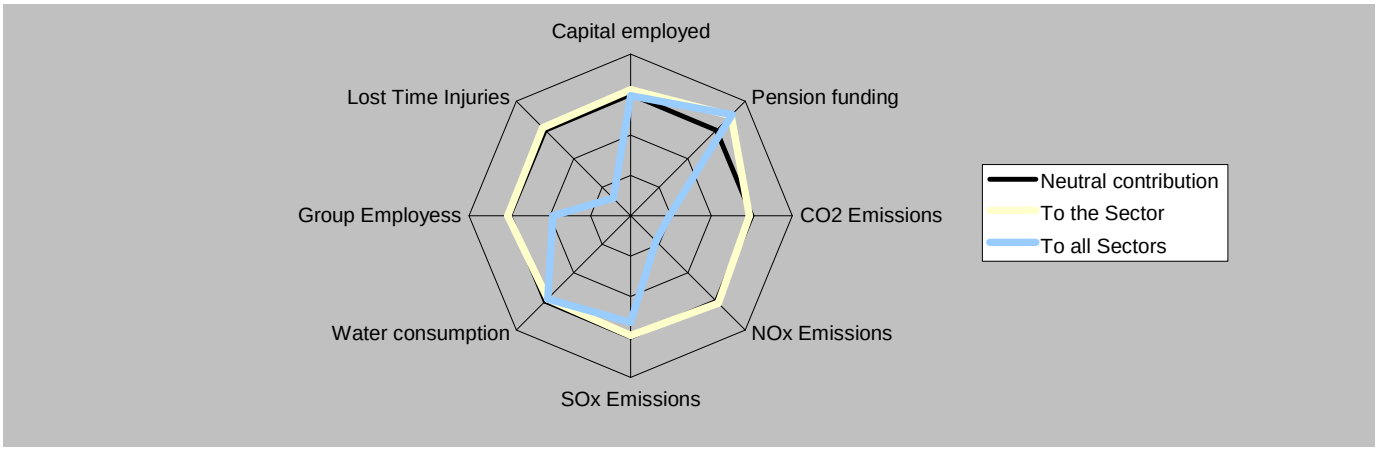
Performance 2006	
To all sectors	
SV Contribution	**-4'732'660'866 €**
Return to cost	**0.405**
To Construction & Materials	
To all sectors	**388'395'481 €**
Return to cost	**1.137**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	2'763'253'111 €	3'444'677'502 €	3'382'453'341 €	2'165'905'037 €	2'406'688'007 €	2'615'058'197 €
Pension funding	170'755'841 €	711'490'904 €	539'670'580 €	265'030'880 €	635'023'374 €	693'734'084 €
CO2 Emissions	9'297'994'639 €	12'800'933'235 €	13'454'297'887 €	2'493'463'271 €	3'164'905'652 €	3'526'652'502 €
NOx Emissions	10'101'323'288 €	12'515'546'938 €	13'823'457'437 €	2'567'925'413 €	2'895'636'480 €	2'923'776'509 €
SOx Emissions	3'516'151'565 €	4'663'061'633 €	5'064'096'629 €	2'792'537'152 €	3'073'029'696 €	3'439'056'450 €
Water consumption	2'106'239'267 €	3'306'750'899 €	3'693'976'683 €	2'811'050'035 €	3'053'154'529 €	3'681'049'859 €
Group Employess	5'778'068'700 €	7'976'576'740 €	8'574'823'488 €	2'415'705'691 €	2'695'018'030 €	3'009'502'084 €
Lost Time Injuries	13'266'464'972 €	25'336'288'065 €	15'136'510'884 €	2'485'973'516 €	3'850'092'747 €	2'812'006'465 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-1'282'753'111 €	-928'577'502 €	-156'453'341 €	-685'405'037 €	109'411'993 €	610'941'803 €
Pension funding	1'309'744'159 €	1'804'609'096 €	2'686'329'420 €	1'215'469'120 €	1'881'076'626 €	2'532'265'916 €
CO2 Emissions	-7'817'494'639 €	-10'284'833'235 €	-10'228'297'887 €	-1'012'963'271 €	-648'805'652 €	-300'652'502 €
NOx Emissions	-8'620'823'288 €	-9'999'446'938 €	-10'597'457'437 €	-1'087'425'413 €	-379'536'480 €	302'223'491 €
SOx Emissions	-2'035'651'565 €	-2'146'961'633 €	-1'838'096'629 €	-1'312'037'152 €	-556'929'696 €	-213'056'450 €
Water consumption	-625'739'267 €	-790'650'899 €	-467'976'683 €	-1'330'550'035 €	-537'054'529 €	-455'049'859 €
Group Employess	-4'297'568'700 €	-5'460'476'740 €	-5'348'823'488 €	-935'205'691 €	-178'918'030 €	216'497'916 €
Lost Time Injuries	-11'785'964'972 €	-22'820'188'065 €	-11'910'510'884 €	-1'005'473'516 €	-1'333'992'747 €	413'993'535 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.5 €	0.7 €	1.0 €	0.68 €	1.05 €	1.23 €
Pension funding	8.7 €	3.5 €	6.0 €	5.59 €	3.96 €	4.65 €
CO2 Emissions	0.2 €	0.2 €	0.2 €	0.59 €	0.80 €	0.91 €
NOx Emissions	0.1 €	0.2 €	0.2 €	0.58 €	0.87 €	1.10 €
SOx Emissions	0.4 €	0.5 €	0.6 €	0.53 €	0.82 €	0.94 €
Water consumption	0.7 €	0.8 €	0.9 €	0.53 €	0.82 €	0.88 €
Group Employess	0.3 €	0.3 €	0.4 €	0.61 €	0.93 €	1.07 €
Lost Time Injuries	0.1 €	0.1 €	0.2 €	0.60 €	0.65 €	1.15 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-4'394'531'423 €	-6'328'315'740 €	-4'732'660'866 €	-769'198'874 €	-205'593'564 €	388'395'481 €
Return to Costs	0.25	0.28	0.41	0.66	0.92	1.14



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Holcim — **Construction & Materials**

Performance Data	2004	2005	2006
Value	3'050'387'097 €	4'571'987'179 €	5'613'664'596 €
Capital employed	13'225'806'452 €	20'082'692'308 €	22'410'559'006 €
Pension funding	190'322'581 €	490'384'615 €	379'503'106 €
CO2 Emissions	71'800'000 €	74'600'000 €	99'800'000 €
NOx Emissions	141'911 t	162'110 t	192'376 t
SOx Emissions	57'618 t	53'575 t	59'140 t
Water consumption	102'574'645 t	133'300'000 t	166'000'000 t
Group Employess	46'909	59'901	88'783
Lost Time Injuries	578	662	701

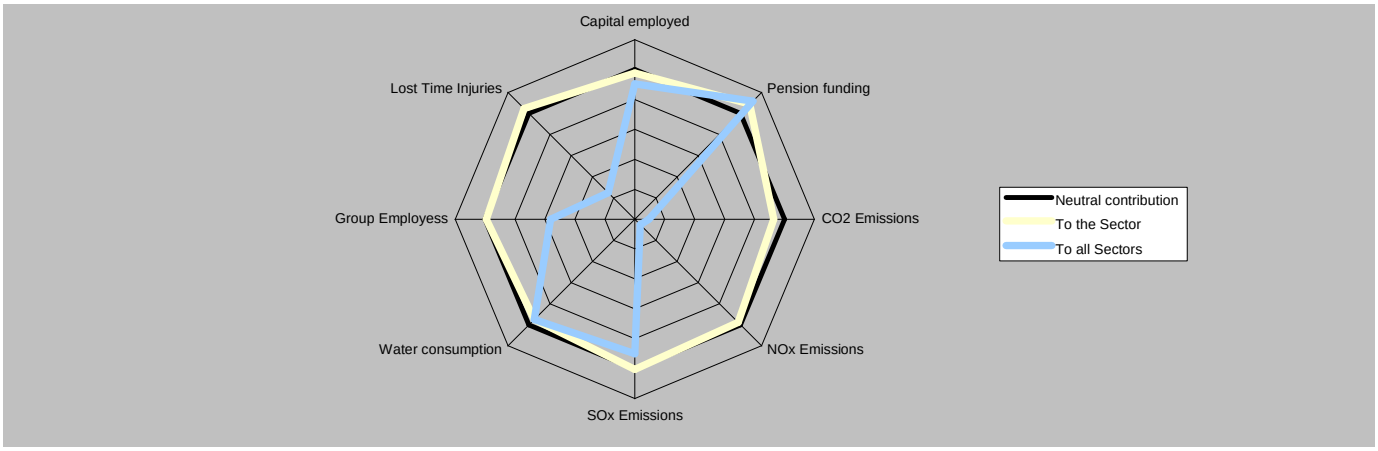
Performance 2006	
To all sectors	
SV Contribution	**-9'926'088'282 €**
Return to cost	**0.361**
To Construction & Materials	
To all sectors	**-146'959'624 €**
Return to cost	**0.974**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	4'031'577'587 €	7'256'729'085 €	8'060'683'772 €	3'160'048'628 €	5'070'048'748 €	6'231'913'658 €
Pension funding	1'094'232'064 €	3'780'110'438 €	2'705'504'111 €	1'698'362'326 €	3'373'842'826 €	3'477'863'136 €
CO2 Emissions	14'935'033'895 €	21'752'838'709 €	28'268'187'982 €	4'005'160'242 €	5'378'176'803 €	7'409'682'519 €
NOx Emissions	15'927'654'324 €	22'801'095'636 €	29'284'235'743 €	4'049'076'258 €	5'275'333'521 €	6'193'860'034 €
SOx Emissions	5'064'840'522 €	6'567'308'310 €	8'138'333'550 €	4'022'510'141 €	4'327'957'692 €	5'526'788'001 €
Water consumption	2'937'900'045 €	5'272'213'197 €	6'928'358'311 €	3'921'009'428 €	4'867'884'546 €	6'904'112'984 €
Group Employess	6'443'902'445 €	11'580'342'301 €	16'565'093'209 €	2'694'078'699 €	3'912'609'671 €	5'813'843'586 €
Lost Time Injuries	14'247'250'302 €	21'637'093'202 €	24'367'626'344 €	2'669'760'709 €	3'287'964'496 €	4'526'929'842 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-981'190'490 €	-2'684'741'906 €	-2'447'019'176 €	-109'661'532 €	-498'061'569 €	-618'249'061 €
Pension funding	1'956'155'032 €	791'876'742 €	2'908'160'485 €	1'352'024'771 €	1'198'144'354 €	2'135'801'460 €
CO2 Emissions	-11'884'646'798 €	-17'180'851'529 €	-22'654'523'386 €	-954'773'146 €	-806'189'624 €	-1'796'017'923 €
NOx Emissions	-12'877'267'227 €	-18'229'108'456 €	-23'670'571'147 €	-998'689'162 €	-703'346'342 €	-580'195'438 €
SOx Emissions	-2'014'453'425 €	-1'995'321'131 €	-2'524'668'953 €	-972'123'044 €	244'029'488 €	86'876'595 €
Water consumption	112'487'052 €	-700'226'018 €	-1'314'693'715 €	-870'622'331 €	-295'897'367 €	-1'290'448'388 €
Group Employess	-3'393'515'348 €	-7'008'355'121 €	-10'951'428'613 €	356'308'398 €	659'377'509 €	-200'178'990 €
Lost Time Injuries	-11'196'863'205 €	-17'065'106'023 €	-18'753'961'747 €	380'626'388 €	1'284'022'684 €	1'086'734'755 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.8 €	0.6 €	0.7 €	0.97 €	0.90 €	0.90 €
Pension funding	2.8 €	1.2 €	2.1 €	1.80 €	1.36 €	1.61 €
CO2 Emissions	0.2 €	0.2 €	0.2 €	0.76 €	0.85 €	0.76 €
NOx Emissions	0.2 €	0.2 €	0.2 €	0.75 €	0.87 €	0.91 €
SOx Emissions	0.6 €	0.7 €	0.7 €	0.76 €	1.06 €	1.02 €
Water consumption	1.0 €	0.9 €	0.8 €	0.78 €	0.94 €	0.81 €
Group Employess	0.5 €	0.4 €	0.3 €	1.13 €	1.17 €	0.97 €
Lost Time Injuries	0.2 €	0.2 €	0.2 €	1.14 €	1.39 €	1.24 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-5'034'911'801 €	-8'008'979'180 €	-9'926'088'282 €	-227'113'707 €	135'259'892 €	-146'959'624 €
Return to Costs	0.38	0.36	0.36	0.93	1.03	0.97



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Lafarge — **Construction & Materials**

Performance Data	2004	2005	2006
Value	4'601'000'000 €	5'225'000'000 €	6'004'000'000 €
Capital employed	19'768'000'000 €	22'036'000'000 €	23'653'000'000 €
Pension funding	1'352'000'000 €	1'359'000'000 €	1'233'000'000 €
CO2 Emissions	85'200'000 €	89'300'000 €	94'400'000 €
NOx Emissions	201'699 t	211'067 t	279'365 t
SOx Emissions	91'608 t	110'774 t	109'481 t
Water consumption	111'456'173 t	139'336'950 t	127'878'400 t
Group Employess	76'059	80'146	82'734
Lost Time Injuries	429	391	336

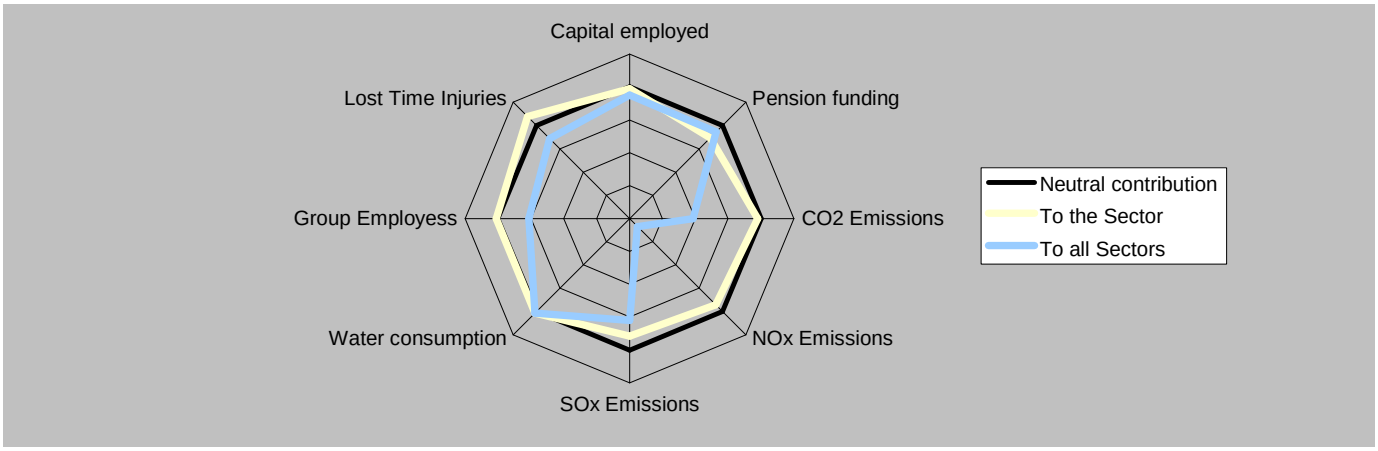
Performance 2006	
To all sectors	
SV Contribution	**-10'755'190'155 €**
Return to cost	**0.358**
To Construction & Materials	
To all sectors	**-1'123'025'763 €**
Return to cost	**0.842**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	6'025'812'190 €	7'962'542'057 €	8'507'567'937 €	4'723'178'244 €	5'563'178'109 €	6'577'410'840 €
Pension funding	7'773'127'844 €	10'475'797'820 €	8'790'143'006 €	12'064'705'391 €	9'349'910'777 €	11'299'526'102 €
CO2 Emissions	17'722'352'198 €	26'039'255'988 €	26'738'646'749 €	4'752'641'402 €	6'437'951'589 €	7'008'757'814 €
NOx Emissions	22'638'118'443 €	29'687'023'705 €	42'526'014'999 €	5'754'988'529 €	6'868'483'594 €	8'994'606'758 €
SOx Emissions	8'052'651'117 €	13'578'803'244 €	15'065'797'560 €	6'395'437'454 €	8'948'641'235 €	10'231'267'700 €
Water consumption	3'192'281'052 €	5'510'983'546 €	5'337'273'346 €	4'260'513'942 €	5'088'343'478 €	5'318'595'915 €
Group Employess	10'448'246'094 €	15'494'200'665 €	15'436'473'442 €	4'368'222'127 €	5'234'971'281 €	5'417'732'395 €
Lost Time Injuries	10'573'021'224 €	12'779'302'034 €	11'671'604'200 €	1'981'255'052 €	1'941'937'901 €	2'168'308'583 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-1'424'812'190 €	-2'737'542'057 €	-2'503'567'937 €	-122'178'244 €	-338'178'109 €	-573'410'840 €
Pension funding	-3'172'127'844 €	-5'250'797'820 €	-2'786'143'006 €	-7'463'705'391 €	-4'124'910'777 €	-5'295'526'102 €
CO2 Emissions	-13'121'352'198 €	-20'814'255'988 €	-20'734'646'749 €	-151'641'402 €	-1'212'951'589 €	-1'004'757'814 €
NOx Emissions	-18'037'118'443 €	-24'462'023'705 €	-36'522'014'999 €	-1'153'988'529 €	-1'643'483'594 €	-2'990'606'758 €
SOx Emissions	-3'451'651'117 €	-8'353'803'244 €	-9'061'797'560 €	-1'794'437'454 €	-3'723'641'235 €	-4'227'267'700 €
Water consumption	1'408'718'948 €	-285'983'546 €	666'726'654 €	340'486'058 €	136'656'522 €	685'404'085 €
Group Employess	-5'847'246'094 €	-10'269'200'665 €	-9'432'473'442 €	232'777'873 €	-9'971'281 €	586'267'605 €
Lost Time Injuries	-5'972'021'224 €	-7'554'302'034 €	-5'667'604'200 €	2'619'744'948 €	3'283'062'099 €	3'835'691'417 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.8 €	0.7 €	0.7 €	0.97 €	0.94 €	0.91 €
Pension funding	0.6 €	0.5 €	0.7 €	0.38 €	0.56 €	0.53 €
CO2 Emissions	0.3 €	0.2 €	0.2 €	0.97 €	0.81 €	0.86 €
NOx Emissions	0.2 €	0.2 €	0.1 €	0.80 €	0.76 €	0.67 €
SOx Emissions	0.6 €	0.4 €	0.4 €	0.72 €	0.58 €	0.59 €
Water consumption	1.4 €	0.9 €	1.1 €	1.08 €	1.03 €	1.13 €
Group Employess	0.4 €	0.3 €	0.4 €	1.05 €	1.00 €	1.11 €
Lost Time Injuries	0.4 €	0.4 €	0.5 €	2.32 €	2.69 €	2.77 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-6'202'201'270 €	-9'965'988'632 €	-10'755'190'155 €	-936'617'768 €	-954'177'246 €	-1'123'025'763 €
Return to Costs	0.43	0.34	0.36	0.83	0.85	0.84



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Norsk Hydro — **Industrial Metals**

Performance Data	2004	2005	2006
Value	5'426'641'703 €	7'914'544'081 €	8'455'499'539 €
Capital employed	16'895'622'521 €	22'772'577'961 €	20'409'268'887 €
Pension funding	150'252'964 €	249'538'824 €	245'500'901 €
CO2 Emissions	6'100'000 €	5'520'000 €	6'320'000 €
NOx Emissions	39'917 t	41'553 t	30'884 t
SOx Emissions	6'800 t	6'500 t	6'200 t
Water consumption	145'200'000 t	156'500'000 t	157'200'000 t
Group Employess	34'604	32'765	33'218
Lost Time Injuries	148	140	105

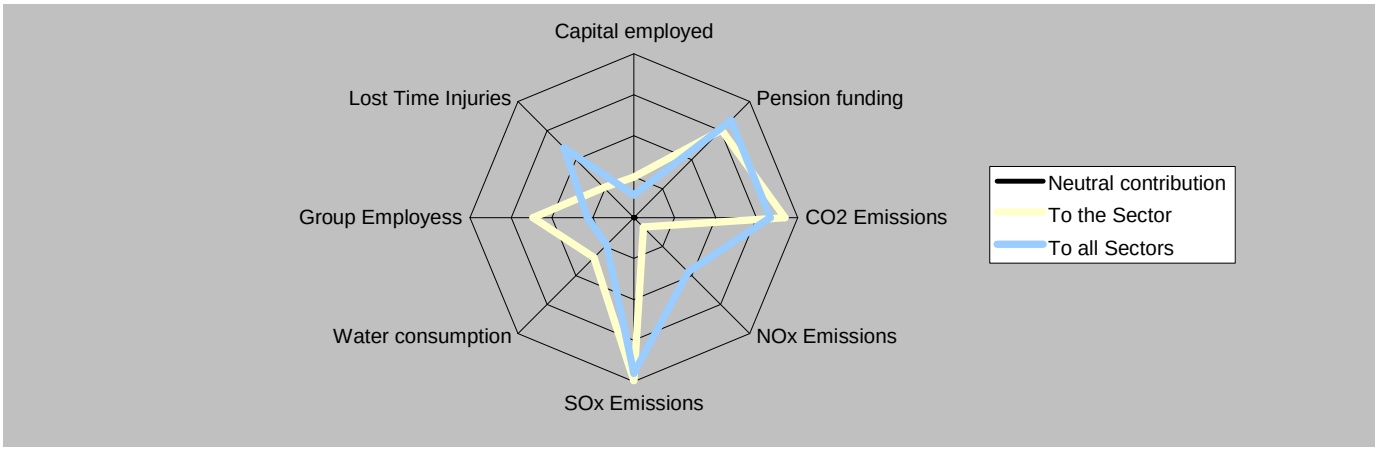
Performance 2006	
To all sectors	
SV Contribution	**4'350'325'665 €**
Return to cost	**2.060**
To Industrial Metals	
To all sectors	**4'220'543'590 €**
Return to cost	**1.997**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	5'150'235'134 €	8'228'698'937 €	7'340'854'928 €	5'363'386'861 €	7'507'263'732 €	6'485'355'021 €
Pension funding	863'857'618 €	1'923'560'172 €	1'750'193'047 €	833'351'895 €	1'711'597'373 €	2'401'406'726 €
CO2 Emissions	1'268'853'855 €	1'609'593'427 €	1'790'129'740 €	845'632'422 €	994'094'366 €	1'079'794'199 €
NOx Emissions	4'480'170'494 €	5'844'553'367 €	4'701'309'912 €	4'880'977'975 €	6'868'608'249 €	7'791'018'668 €
SOx Emissions	597'745'766 €	796'780'290 €	853'190'193 €	341'831'781 €	471'614'330 €	506'913'938 €
Water consumption	4'158'757'605 €	6'189'807'692 €	6'561'071'847 €	4'613'576'231 €	5'995'443'306 €	5'696'489'358 €
Group Employess	4'753'561'155 €	6'334'283'492 €	6'197'799'874 €	2'788'212'071 €	3'377'206'569 €	3'533'471'752 €
Lost Time Injuries	3'638'064'079 €	4'564'999'556 €	3'646'841'453 €	4'240'599'686 €	6'376'276'992 €	6'385'197'929 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	276'406'568 €	-314'154'856 €	1'114'644'611 €	63'254'842 €	407'280'349 €	1'970'144'518 €
Pension funding	4'562'784'085 €	5'990'983'909 €	6'705'306'492 €	4'593'289'808 €	6'202'946'708 €	6'054'092'813 €
CO2 Emissions	4'157'787'848 €	6'304'950'654 €	6'665'369'799 €	4'581'009'280 €	6'920'449'715 €	7'375'705'340 €
NOx Emissions	946'471'209 €	2'069'990'714 €	3'754'189'627 €	545'663'727 €	1'045'935'832 €	664'480'871 €
SOx Emissions	4'828'895'937 €	7'117'763'791 €	7'602'309'346 €	5'084'809'922 €	7'442'929'751 €	7'948'585'601 €
Water consumption	1'267'884'097 €	1'724'736'389 €	1'894'427'692 €	813'065'471 €	1'919'100'775 €	2'759'010'180 €
Group Employess	673'080'548 €	1'580'260'589 €	2'257'699'665 €	2'638'429'632 €	4'537'337'512 €	4'922'027'787 €
Lost Time Injuries	1'788'577'624 €	3'349'544'525 €	4'808'658'086 €	1'186'042'016 €	1'538'267'089 €	2'070'301'610 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.1 €	1.0 €	1.2 €	1.01 €	1.05 €	1.30 €
Pension funding	6.3 €	4.1 €	4.8 €	6.51 €	4.62 €	3.52 €
CO2 Emissions	4.3 €	4.9 €	4.7 €	6.42 €	7.96 €	7.83 €
NOx Emissions	1.2 €	1.4 €	1.8 €	1.11 €	1.15 €	1.09 €
SOx Emissions	9.1 €	9.9 €	9.9 €	15.88 €	16.78 €	16.68 €
Water consumption	1.3 €	1.3 €	1.3 €	1.18 €	1.32 €	1.48 €
Group Employess	1.1 €	1.2 €	1.4 €	1.95 €	2.34 €	2.39 €
Lost Time Injuries	1.5 €	1.7 €	2.3 €	1.28 €	1.24 €	1.32 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	2'312'735'989 €	3'478'009'464 €	4'350'325'665 €	2'438'195'587 €	3'751'780'967 €	4'220'543'590 €
Return to Costs	1.74	1.78	2.06	1.82	1.90	2.00



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POSCO — **Industrial Metals**

Performance Data	2004	2005	2006
Value	5'015'404'048 €	6'091'137'420 €	4'730'681'485 €
Capital employed	13'654'227'443 €	18'081'123'541 €	21'238'778'803 €
Pension funding	51'766'703 €	81'594'111 €	74'394'634 €
CO2 Emissions	63'118'000 €	62'830'000 €	64'113'000 €
NOx Emissions	42'582 t	42'655 t	43'344 t
SOx Emissions	84'000 t	40'000 t	13'000 t
Water consumption	114'156'000 t	114'680'000 t	120'400'000 t
Group Employess	19'377	19'004	17'523
Lost Time Injuries	16	7	11

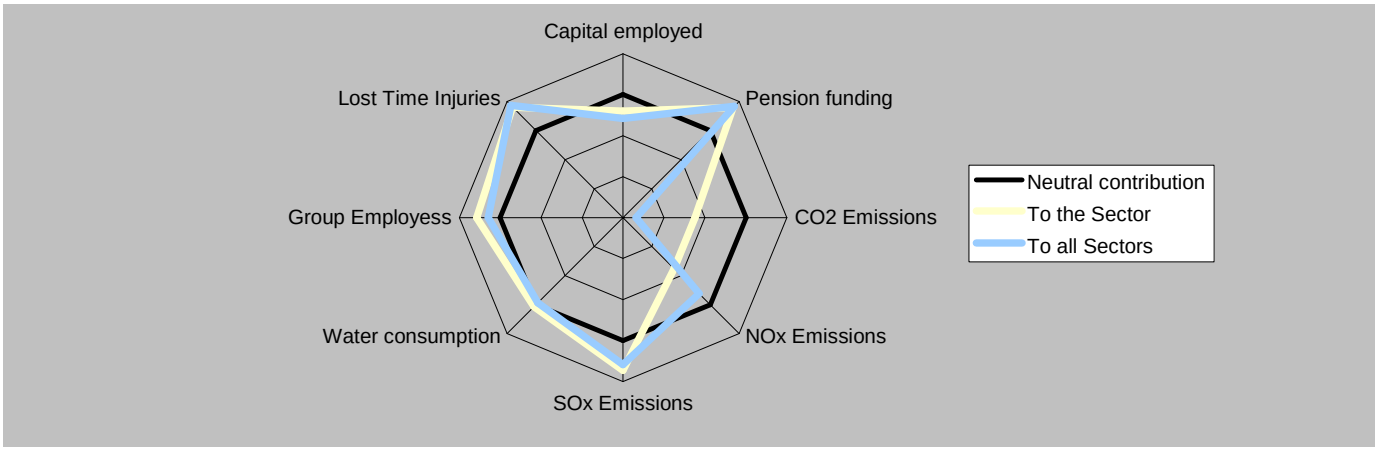
Performance 2006	
To all sectors	
SV Contribution	**-693'788'293 €**
Return to cost	**0.872**
To Industrial Metals	
To all sectors	**64'650'316 €**
Return to cost	**1.014**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	4'162'171'700 €	6'533'477'339 €	7'639'215'050 €	4'334'430'648 €	5'960'667'397 €	6'748'944'389 €
Pension funding	297'625'148 €	628'964'985 €	530'364'537 €	287'115'001 €	559'657'468 €	727'703'134 €
CO2 Emissions	13'129'101'244 €	18'320'788'955 €	18'159'903'167 €	8'749'938'891 €	11'315'026'994 €	10'953'931'242 €
NOx Emissions	4'779'272'758 €	5'999'521'376 €	6'597'995'145 €	5'206'838'692 €	7'050'729'016 €	10'934'208'615 €
SOx Emissions	7'383'918'287 €	4'903'263'321 €	1'788'947'179 €	4'222'627'879 €	2'902'242'029 €	1'062'884'063 €
Water consumption	3'269'608'355 €	4'535'764'512 €	5'025'146'631 €	3'627'186'007 €	4'393'338'264 €	4'362'960'043 €
Group Employess	2'661'823'907 €	3'673'942'423 €	3'269'433'656 €	1'561'298'847 €	1'958'810'732 €	1'863'960'067 €
Lost Time Injuries	399'891'972 €	235'354'804 €	384'752'862 €	466'122'018 €	328'737'692 €	673'657'796 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	853'232'348 €	-442'339'919 €	-2'908'533'565 €	680'973'400 €	130'470'024 €	-2'018'262'905 €
Pension funding	4'717'778'900 €	5'462'172'435 €	4'200'316'948 €	4'728'289'047 €	5'531'479'952 €	4'002'978'350 €
CO2 Emissions	-8'113'697'197 €	-12'229'651'535 €	-13'429'221'682 €	-3'734'534'843 €	-5'223'889'573 €	-6'223'249'758 €
NOx Emissions	236'131'289 €	91'616'044 €	-1'867'313'660 €	-191'434'644 €	-959'591'595 €	-6'203'527'131 €
SOx Emissions	-2'368'514'239 €	1'187'874'099 €	2'941'734'306 €	792'776'169 €	3'188'895'391 €	3'667'797'422 €
Water consumption	1'745'795'692 €	1'555'372'908 €	-294'465'146 €	1'388'218'040 €	1'697'799'156 €	367'721'442 €
Group Employess	2'353'580'140 €	2'417'194'997 €	1'461'247'829 €	3'454'105'201 €	4'132'326'688 €	2'866'721'418 €
Lost Time Injuries	4'615'512'076 €	5'855'782'617 €	4'345'928'623 €	4'549'282'029 €	5'762'399'728 €	4'057'023'689 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.2 €	0.9 €	0.6 €	1.16 €	1.02 €	0.70 €
Pension funding	16.9 €	9.7 €	8.9 €	17.47 €	10.88 €	6.50 €
CO2 Emissions	0.4 €	0.3 €	0.3 €	0.57 €	0.54 €	0.43 €
NOx Emissions	1.0 €	1.0 €	0.7 €	0.96 €	0.86 €	0.43 €
SOx Emissions	0.7 €	1.2 €	2.6 €	1.19 €	2.10 €	4.45 €
Water consumption	1.5 €	1.3 €	0.9 €	1.38 €	1.39 €	1.08 €
Group Employess	1.9 €	1.7 €	1.4 €	3.21 €	3.11 €	2.54 €
Lost Time Injuries	12.5 €	25.9 €	12.3 €	10.76 €	18.53 €	7.02 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	504'977'376 €	487'252'706 €	-693'788'293 €	1'458'459'300 €	1'782'486'221 €	64'650'316 €
Return to Costs	1.11	1.09	0.87	1.41	1.41	1.01



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Rio Tinto Group — **Mining**

Performance Data	2004	2005	2006
Value	4'474'663'909 €	8'405'505'827 €	9'947'715'390 €
Capital employed	17'258'827'005 €	21'125'654'450 €	21'757'975'297 €
Pension funding	0 €	0 €	0 €
CO2 Emissions	23'276'000 €	24'656'000 €	26'036'000 €
NOx Emissions	18'665 t	43'079 t	22'230 t
SOx Emissions	209'070 t	264'541 t	181'224 t
Water consumption	378'000'000 t	370'000'000 t	391'000'000 t
Group Employess	32'000	32'000	35'000
Lost Time Injuries	164	141	138

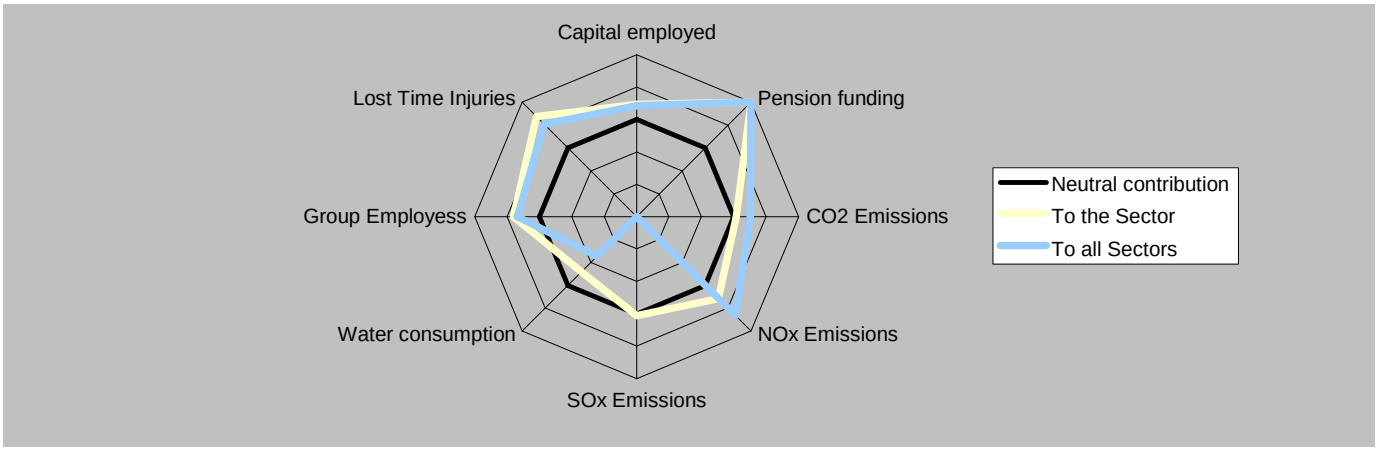
Performance 2006	
To all sectors	
SV Contribution	**1'050'764'222 €**
Return to cost	**1.118**
To Mining	
To all sectors	**2'956'227'102 €**
Return to cost	**1.423**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	5'260'949'522 €	7'633'595'573 €	7'825'960'894 €	4'826'038'865 €	7'590'332'448 €	7'636'351'174 €
Pension funding	0 €	0 €	0 €	0 €	0 €	0 €
CO2 Emissions	4'841'613'495 €	7'189'517'308 €	7'374'654'732 €	5'091'358'506 €	8'431'291'375 €	9'565'175'940 €
NOx Emissions	2'094'911'885 €	6'059'118'967 €	3'383'967'754 €	3'377'918'831 €	6'146'743'735 €	7'060'543'242 €
SOx Emissions	18'378'017'829 €	32'427'840'142 €	24'938'437'762 €	6'237'840'906 €	11'050'625'325 €	9'664'836'050 €
Water consumption	10'826'517'733 €	14'634'050'135 €	16'319'205'420 €	7'385'235'087 €	10'603'389'584 €	12'930'237'942 €
Group Employess	4'395'848'947 €	6'186'390'104 €	6'530'284'653 €	3'193'223'968 €	5'337'270'572 €	5'937'429'248 €
Lost Time Injuries	4'049'613'877 €	4'623'542'061 €	4'803'098'127 €	2'540'164'915 €	3'513'313'168 €	3'137'332'709 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-786'285'613 €	771'910'254 €	2'121'754'496 €	-351'374'956 €	815'173'379 €	2'311'364'216 €
Pension funding	4'474'663'909 €	8'405'505'827 €	9'947'715'390 €	4'474'663'909 €	8'405'505'827 €	9'947'715'390 €
CO2 Emissions	-366'949'586 €	1'215'988'518 €	2'573'060'657 €	-616'694'597 €	-25'785'548 €	382'539'450 €
NOx Emissions	2'379'752'024 €	2'346'386'860 €	6'563'747'636 €	1'096'745'078 €	2'258'762'092 €	2'887'172'147 €
SOx Emissions	-13'903'353'920 €	-24'022'334'315 €	-14'990'722'372 €	-1'763'176'997 €	-2'645'119'498 €	282'879'340 €
Water consumption	-6'351'853'824 €	-6'228'544'308 €	-6'371'490'030 €	-2'910'571'178 €	-2'197'883'757 €	-2'982'522'552 €
Group Employess	78'814'962 €	2'219'115'723 €	3'417'430'737 €	1'281'439'941 €	3'068'235'254 €	4'010'286'142 €
Lost Time Injuries	425'050'032 €	3'781'963'766 €	5'144'617'263 €	1'934'498'994 €	4'892'192'659 €	6'810'382'680 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.9 €	1.1 €	1.3 €	0.93 €	1.11 €	1.30 €
Pension funding	10.0 €	10.0 €	10.0 €	10.00 €	10.00 €	10.00 €
CO2 Emissions	0.9 €	1.2 €	1.3 €	0.88 €	1.00 €	1.04 €
NOx Emissions	2.1 €	1.4 €	2.9 €	1.32 €	1.37 €	1.41 €
SOx Emissions	0.2 €	0.3 €	0.4 €	0.72 €	0.76 €	1.03 €
Water consumption	0.4 €	0.6 €	0.6 €	0.61 €	0.79 €	0.77 €
Group Employess	1.0 €	1.4 €	1.5 €	1.40 €	1.57 €	1.68 €
Lost Time Injuries	1.1 €	1.8 €	2.1 €	1.76 €	2.39 €	3.17 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-1'756'270'252 €	-1'438'750'960 €	1'050'764'222 €	393'191'274 €	1'821'385'051 €	2'956'227'102 €
Return to Costs	0.72	0.85	1.12	1.10	1.28	1.42



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Shell — **Oil & Gas Producers**

Performance Data	2004	2005	2006
Value	31'300'782'981 €	46'922'817'092 €	42'934'757'900 €
Capital employed	97'942'088'935 €	113'622'698'868 €	120'124'270'668 €
Pension funding	4'762'614'968 €	0 €	10'457'679'776 €
CO2 Emissions	106'000'000 €	100'000'000 €	94'000'000 €
NOx Emissions	197'000 t	184'000 t	180'000 t
SOx Emissions	304'000 t	300'000 t	296'000 t
Water consumption	353'051'628 t	298'000'000 t	285'000'000 t
Group Employess	113'000	109'000	108'000
Lost Time Injuries	178	155	136

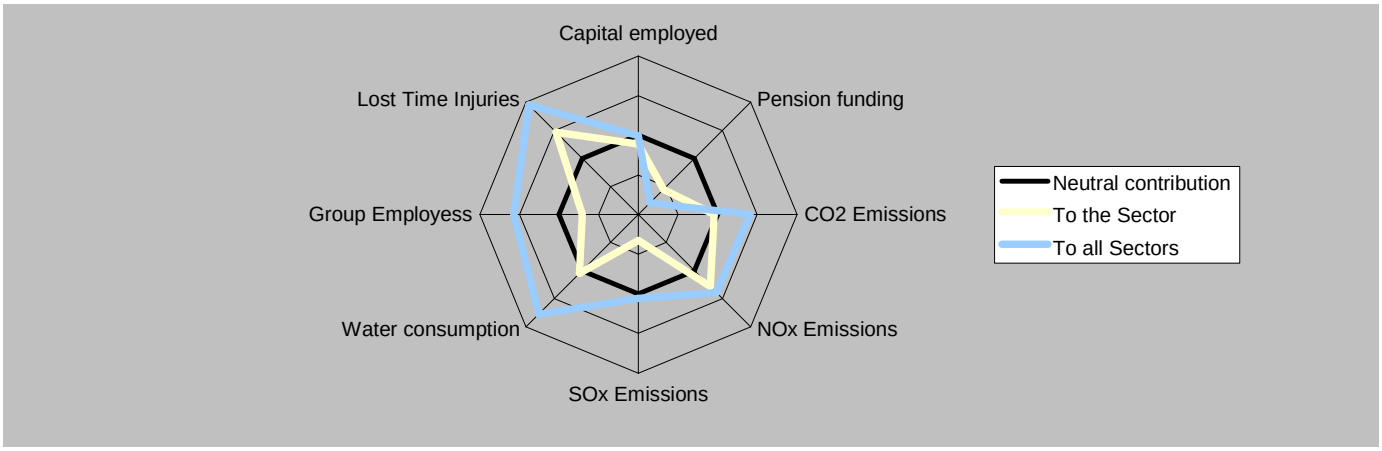
Performance 2006	
To all sectors	
SV Contribution	**11'771'369'426 €**
Return to cost	**1.378**
To Oil & Gas Producers	
To all sectors	**-4'347'937'500 €**
Return to cost	**0.908**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	29'855'353'772 €	41'056'703'504 €	43'206'586'633 €	30'659'896'359 €	44'476'277'133 €	47'370'463'449 €
Pension funding	27'381'963'769 €	0 €	74'553'528'579 €	28'861'066'702 €	0 €	65'025'352'819 €
CO2 Emissions	22'048'935'833 €	29'159'301'218 €	26'625'347'398 €	32'612'967'290 €	45'666'761'299 €	44'727'234'576 €
NOx Emissions	22'110'674'309 €	25'879'967'904 €	27'400'312'064 €	24'014'098'764 €	32'814'885'503 €	31'587'072'908 €
SOx Emissions	26'722'751'895 €	36'774'474'905 €	40'732'951'144 €	43'952'309'114 €	67'596'673'335 €	69'887'958'422 €
Water consumption	10'111'956'916 €	11'786'343'081 €	11'895'073'005 €	25'573'424'329 €	34'579'493'250 €	40'847'136'156 €
Group Employess	15'522'841'592 €	21'072'391'292 €	20'150'592'643 €	37'143'689'673 €	55'362'109'832 €	54'573'792'915 €
Lost Time Injuries	4'400'061'232 €	5'062'159'332 €	4'742'716'322 €	19'309'550'551 €	22'697'777'335 €	24'242'551'948 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1'445'429'209 €	5'866'113'588 €	-271'828'734 €	640'886'622 €	2'446'539'959 €	-4'435'705'549 €
Pension funding	3'918'819'213 €	46'922'817'092 €	-31'618'770'680 €	2'439'716'279 €	46'922'817'092 €	-22'090'594'920 €
CO2 Emissions	9'251'847'148 €	17'763'515'873 €	16'309'410'502 €	-1'312'184'309 €	1'256'055'793 €	-1'792'476'677 €
NOx Emissions	9'190'108'673 €	21'042'849'187 €	15'534'445'835 €	7'286'684'217 €	14'107'931'588 €	11'347'684'991 €
SOx Emissions	4'578'031'086 €	10'148'342'187 €	2'201'806'755 €	-12'651'526'133 €	-20'673'856'244 €	-26'953'200'522 €
Water consumption	21'188'826'065 €	35'136'474'010 €	31'039'684'895 €	5'727'358'652 €	12'343'323'841 €	2'087'621'743 €
Group Employess	15'777'941'389 €	25'850'425'800 €	22'784'165'257 €	-5'842'906'691 €	-8'439'292'740 €	-11'639'035'016 €
Lost Time Injuries	26'900'721'749 €	41'860'657'759 €	38'192'041'578 €	11'991'232'430 €	24'225'039'756 €	18'692'205'952 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.0 €	1.1 €	1.0 €	1.02 €	1.06 €	0.91 €
Pension funding	1.1 €	10.0 €	0.6 €	1.08 €	10.00 €	0.66 €
CO2 Emissions	1.4 €	1.6 €	1.6 €	0.96 €	1.03 €	0.96 €
NOx Emissions	1.4 €	1.8 €	1.6 €	1.30 €	1.43 €	1.36 €
SOx Emissions	1.2 €	1.3 €	1.1 €	0.71 €	0.69 €	0.61 €
Water consumption	3.1 €	4.0 €	3.6 €	1.22 €	1.36 €	1.05 €
Group Employess	2.0 €	2.2 €	2.1 €	0.84 €	0.85 €	0.79 €
Lost Time Injuries	7.1 €	9.3 €	9.1 €	1.62 €	2.07 €	1.77 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	11'531'465'567 €	25'573'899'437 €	11'771'369'426 €	1'034'907'633 €	9'023'569'881 €	-4'347'937'500 €
Return to Costs	1.58	2.20	1.38	1.03	1.24	0.91



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Statoil — **Oil & Gas Producers**

Performance Data	2004	2005	2006
Value	9'242'760'170 €	13'636'471'945 €	16'146'168'168 €
Capital employed	20'505'858'222 €	27'674'981'573 €	28'051'074'574 €
Pension funding	0 €	0 €	0 €
CO2 Emissions	9'800'000 €	10'300'000 €	10'000'000 €
NOx Emissions	31'100 t	34'700 t	31'600 t
SOx Emissions	36'724 t	39'773 t	38'936 t
Water consumption	6'400'000 t	6'800'000 t	7'600'000 t
Group Employess	23'994	25'644	25'435
Lost Time Injuries	95	81	88

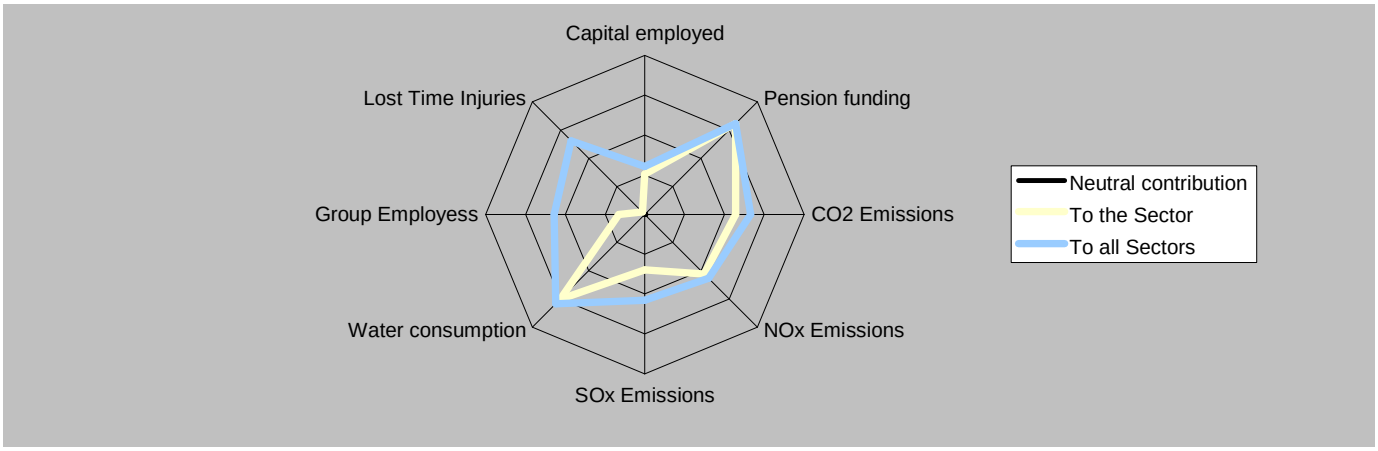
Performance 2006	
To all sectors	
SV Contribution	**12'243'078'030 €**
Return to cost	**4.137**
To Oil & Gas Producers	
To all sectors	**8'621'048'153 €**
Return to cost	**2.146**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	6'250'731'001 €	10'000'145'431 €	10'089'477'980 €	6'419'175'808 €	10'833'047'994 €	11'061'814'531 €
Pension funding	0 €	0 €	0 €	0 €	0 €	0 €
CO2 Emissions	2'038'486'520 €	3'003'408'025 €	2'832'483'766 €	3'015'161'127 €	4'703'676'414 €	4'758'216'444 €
NOx Emissions	3'490'568'381 €	4'880'624'382 €	4'810'277'007 €	3'791'058'231 €	6'188'459'386 €	5'545'286'133 €
SOx Emissions	3'228'204'146 €	4'875'480'189 €	5'358'006'832 €	5'309'596'373 €	8'961'820'461 €	9'193'052'508 €
Water consumption	183'306'120 €	268'950'111 €	317'201'947 €	463'586'350 €	789'062'262 €	1'089'256'964 €
Group Employess	3'296'062'488 €	4'957'618'370 €	4'745'651'147 €	7'886'953'009 €	13'024'825'179 €	12'852'633'544 €
Lost Time Injuries	2'335'731'619 €	2'646'565'014 €	3'071'622'422 €	10'250'295'485 €	11'866'703'404 €	15'700'699'992 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	2'992'029'169 €	3'636'326'515 €	6'056'690'188 €	2'823'584'362 €	2'803'423'951 €	5'084'353'637 €
Pension funding	9'242'760'170 €	13'636'471'945 €	16'146'168'168 €	9'242'760'170 €	13'636'471'945 €	16'146'168'168 €
CO2 Emissions	7'204'273'650 €	10'633'063'920 €	13'313'684'402 €	6'227'599'043 €	8'932'795'531 €	11'387'951'723 €
NOx Emissions	5'752'191'789 €	8'755'847'563 €	11'335'891'161 €	5'451'701'939 €	7'448'012'560 €	10'600'882'035 €
SOx Emissions	6'014'556'024 €	8'760'991'757 €	10'788'161'336 €	3'933'163'797 €	4'674'651'484 €	6'953'115'660 €
Water consumption	9'059'454'050 €	13'367'521'835 €	15'828'966'221 €	8'779'173'820 €	12'847'409'683 €	15'056'911'203 €
Group Employess	5'946'697'682 €	8'678'853'576 €	11'400'517'021 €	1'355'807'161 €	611'646'766 €	3'293'534'623 €
Lost Time Injuries	6'907'028'551 €	10'989'906'932 €	13'074'545'746 €	-1'007'535'315 €	1'769'768'541 €	445'468'175 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	1.5 €	1.4 €	1.6 €	1.44 €	1.26 €	1.46 €
Pension funding	10.0 €	10.0 €	10.0 €	10.00 €	10.00 €	10.00 €
CO2 Emissions	4.5 €	4.5 €	5.7 €	3.07 €	2.90 €	3.39 €
NOx Emissions	2.6 €	2.8 €	3.4 €	2.44 €	2.20 €	2.91 €
SOx Emissions	2.9 €	2.8 €	3.0 €	1.74 €	1.52 €	1.76 €
Water consumption	50.4 €	50.7 €	50.9 €	19.94 €	17.28 €	14.82 €
Group Employess	2.8 €	2.8 €	3.4 €	1.17 €	1.05 €	1.26 €
Lost Time Injuries	4.0 €	5.2 €	5.3 €	0.90 €	1.15 €	1.03 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	6'639'873'885 €	9'807'373'005 €	12'243'078'030 €	4'600'781'872 €	6'590'522'558 €	8'621'048'153 €
Return to Costs	3.55	3.56	4.14	1.99	1.94	2.15



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Xstrata **Mining**

Performance Data	2004	2005	2006
Value	1'758'531'541 €	2'989'106'570 €	3'061'301'811 €
Capital employed	8'151'794'948 €	10'495'693'295 €	30'767'598'697 €
Pension funding	0 €	0 €	0 €
CO2 Emissions	8'970'000 €	8'630'000 €	8'890'000 €
NOx Emissions	1'500 t	1'100 t	1'200 t
SOx Emissions	229'000 t	238'000 t	253'000 t
Water consumption	74'900'000 t	75'300'000 t	85'600'000 t
Group Employess	24'000	24'091	44'080
Lost Time Injuries	201	164	230

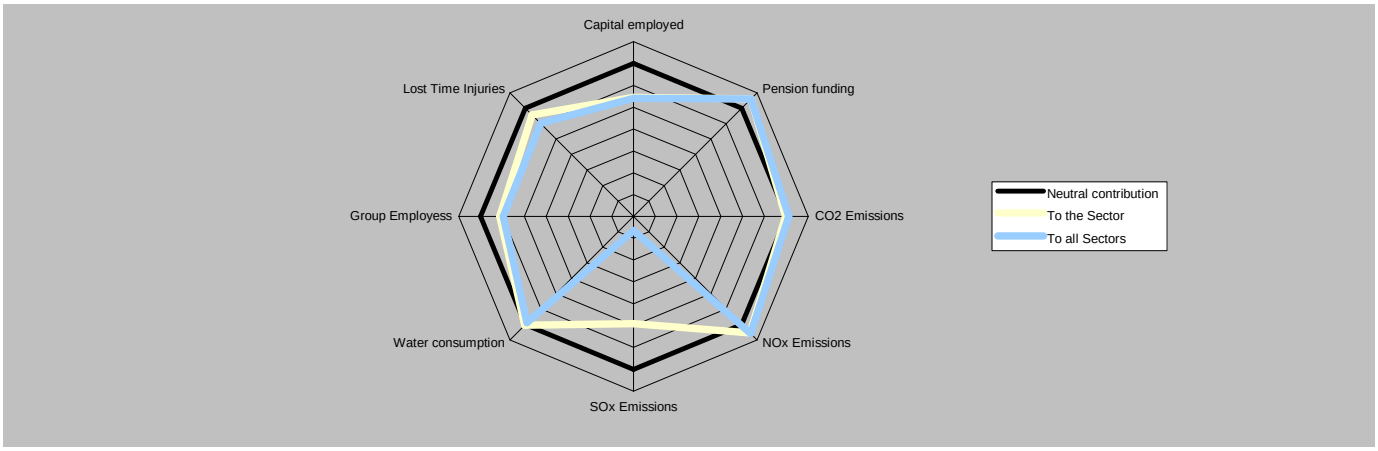
Performance 2006	
To all sectors	
SV Contribution	**-5'484'321'642 €**
Return to cost	**0.358**
To Mining	
To all sectors	**-2'371'512'488 €**
Return to cost	**0.563**

Opportunity Cost	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	2'484'883'922 €	3'792'539'448 €	11'066'563'911 €	2'279'464'255 €	3'771'045'369 €	10'798'439'893 €
Pension funding	0 €	0 €	0 €	0 €	0 €	0 €
CO2 Emissions	1'865'839'193 €	2'516'447'695 €	2'518'078'068 €	1'962'084'800 €	2'951'088'764 €	3'266'032'190 €
NOx Emissions	168'355'388 €	154'717'199 €	182'668'747 €	271'462'891 €	156'954'663 €	381'132'647 €
SOx Emissions	20'129'967'710 €	29'174'416'758 €	34'815'664'322 €	6'832'485'265 €	9'941'937'152 €	13'492'733'221 €
Water consumption	2'145'254'440 €	2'978'226'960 €	3'572'695'611 €	1'463'370'656 €	2'157'933'069 €	2'830'763'089 €
Group Employess	3'296'886'710 €	4'657'385'125 €	8'224'427'071 €	2'394'917'976 €	4'018'130'792 €	7'477'768'035 €
Lost Time Injuries	4'952'989'280 €	5'345'521'570 €	7'984'889'897 €	3'106'817'088 €	4'061'927'214 €	5'215'645'317 €

Value Contribution	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	-726'352'381 €	-803'432'878 €	-8'005'262'100 €	-520'932'714 €	-781'938'799 €	-7'737'138'082 €
Pension funding	1'758'531'541 €	2'989'106'570 €	3'061'301'811 €	1'758'531'541 €	2'989'106'570 €	3'061'301'811 €
CO2 Emissions	-107'307'652 €	472'658'875 €	543'223'743 €	-203'553'259 €	38'017'806 €	-204'730'379 €
NOx Emissions	1'590'176'153 €	2'834'389'370 €	2'878'633'064 €	1'487'068'650 €	2'832'151'907 €	2'680'169'164 €
SOx Emissions	-18'371'436'169 €	-26'185'310'188 €	-31'754'362'511 €	-5'073'953'724 €	-6'952'830'582 €	-10'431'431'410 €
Water consumption	-386'722'899 €	10'879'610 €	-511'393'800 €	295'160'885 €	831'173'501 €	230'538'722 €
Group Employess	-1'538'355'169 €	-1'668'278'555 €	-5'163'125'260 €	-636'386'435 €	-1'029'024'223 €	-4'416'466'224 €
Lost Time Injuries	-3'194'457'740 €	-2'356'415'000 €	-4'923'588'086 €	-1'348'285'547 €	-1'072'820'644 €	-2'154'343'506 €

Return to Costs	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Capital employed	0.7 €	0.8 €	0.3 €	0.77 €	0.79 €	0.28 €
Pension funding	10.0 €	10.0 €	10.0 €	10.00 €	10.00 €	10.00 €
CO2 Emissions	0.9 €	1.2 €	1.2 €	0.90 €	1.01 €	0.94 €
NOx Emissions	10.4 €	19.3 €	16.8 €	6.48 €	19.04 €	8.03 €
SOx Emissions	0.1 €	0.1 €	0.1 €	0.26 €	0.30 €	0.23 €
Water consumption	0.8 €	1.0 €	0.9 €	1.20 €	1.39 €	1.08 €
Group Employess	0.5 €	0.6 €	0.4 €	0.73 €	0.74 €	0.41 €
Lost Time Injuries	0.4 €	0.6 €	0.4 €	0.57 €	0.74 €	0.59 €

Results	To all sectors			To the sector		
	2004	2005	2006	2004	2005	2006
Sustainable Value	-2'621'990'539 €	-3'088'300'275 €	-5'484'321'642 €	-530'293'825 €	-393'270'558 €	-2'371'512'488 €
Return to Costs	0.40	0.49	0.36	0.77	0.88	0.56



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Chemicals

Performance Data	2004	2005	2006
Value	5'859'865'423 €	6'636'190'346 €	7'349'290'730 €
Capital employed	17'810'630'835 €	18'643'881'037 €	21'311'427'687 €
Pension funding	2'040'140'000 €	2'620'640'000 €	1'869'696'619 €
CO2 Emissions	11'277'515 €	10'980'000 €	15'969'232 €
NOx Emissions	10'890 t	11'746 t	10'738 t
SOx Emissions	4'423 t	5'090 t	4'508 t
Water consumption	635'086'005 t	628'440'910 t	644'948'040 t
Group Employess	63'862	61'334	68'861
Lost Time Injuries	327	300	341

Performance 2006	
SV Contribution	**-2'573'993'280 €**
Return to cost	**0.741**

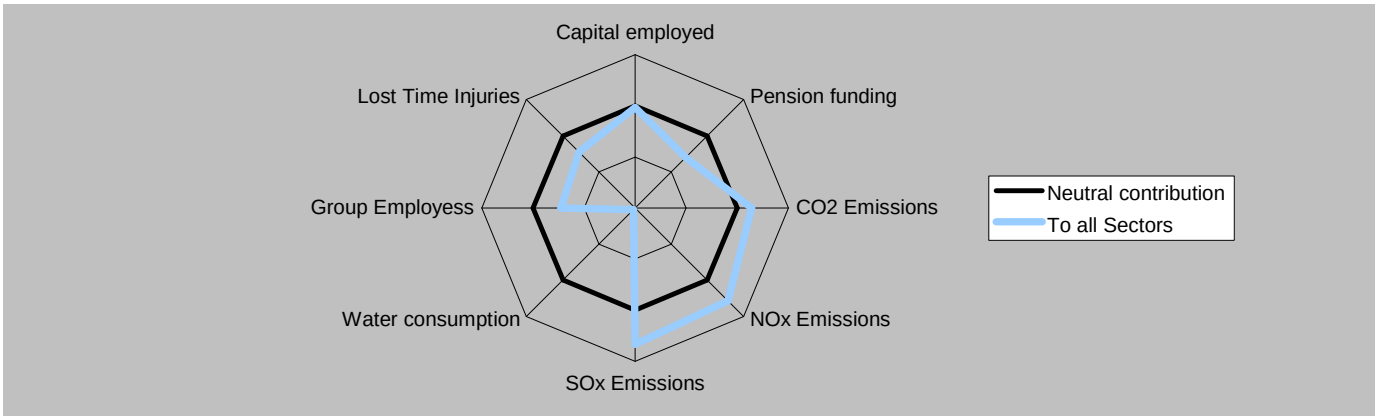
	Opportunity Cost			Value Contribution		
	2004	2005	2006	2004	2005	2006
Capital employed	5'429'154'006 €	6'736'825'507 €	7'665'345'575 €	430'711'417 €	-100'635'161 €	-316'054'845 €
Pension funding	11'729'488'935 €	20'201'099'927 €	13'329'197'614 €	-5'869'623'512 €	-13'564'909'580 €	-5'979'906'884 €
CO2 Emissions	2'345'822'622 €	3'201'691'274 €	4'523'258'984 €	3'514'042'801 €	3'434'499'073 €	2'826'031'746 €
NOx Emissions	1'222'276'800 €	1'652'111'730 €	1'634'559'901 €	4'637'588'622 €	4'984'078'616 €	5'714'730'829 €
SOx Emissions	388'813'981 €	623'966'274 €	620'339'662 €	5'471'051'441 €	6'012'224'072 €	6'728'951'068 €
Water consumption	18'189'867'458 €	24'855'772'381 €	26'918'259'738 €	-12'330'002'035 €	-18'219'582'035 €	-19'568'969'008 €
Group Employess	8'772'713'320 €	11'857'376'583 €	12'848'092'501 €	-2'912'847'898 €	-5'221'186'236 €	-5'498'801'771 €
Lost Time Injuries	8'051'303'824 €	9'818'849'139 €	11'847'218'109 €	-2'191'438'401 €	-3'182'658'792 €	-4'497'927'379 €

Cross sector results of the Chemicals sector

	2004	2005	2006
Sustainable Value	-1'156'314'696 €	-3'232'271'255 €	-2'573'993'280 €
Return to Cost	0.84	0.67	0.74

Performance with regards to specific impact (Return to Cost ratios)

	2004	2005	2006
Capital employed	1.08 €	0.99 €	0.96 €
Pension funding	0.50 €	0.33 €	0.55 €
CO2 Emissions	2.50 €	2.07 €	1.62 €
NOx Emissions	4.79 €	4.02 €	4.50 €
SOx Emissions	15.07 €	10.64 €	11.85 €
Water consumption	0.32 €	0.27 €	0.27 €
Group Employess	0.67 €	0.56 €	0.57 €
Lost Time Injuries	0.73 €	0.68 €	0.62 €



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Construction & Materials

Performance Data	2004	2005	2006
Value	2'931'353'353 €	3'924'915'570 €	4'605'733'922 €
Capital employed	12'268'644'140 €	15'546'768'017 €	16'562'660'764 €
Pension funding	328'494'531 €	570'482'477 €	502'575'938 €
CO2 Emissions	52'550'000 €	54'442'000 €	62'034'000 €
NOx Emissions	102'737 t	120'612 t	143'050 t
SOx Emissions	41'988 t	48'586 t	49'284 t
Water consumption	76'684'980 t	107'478'154 t	110'738'604 t
Group Employess	51'040	60'089	70'334
Lost Time Injuries	634	790	713

Performance 2006	
SV Contribution	**-7'669'960'453 €**
Return to cost	**0.375**

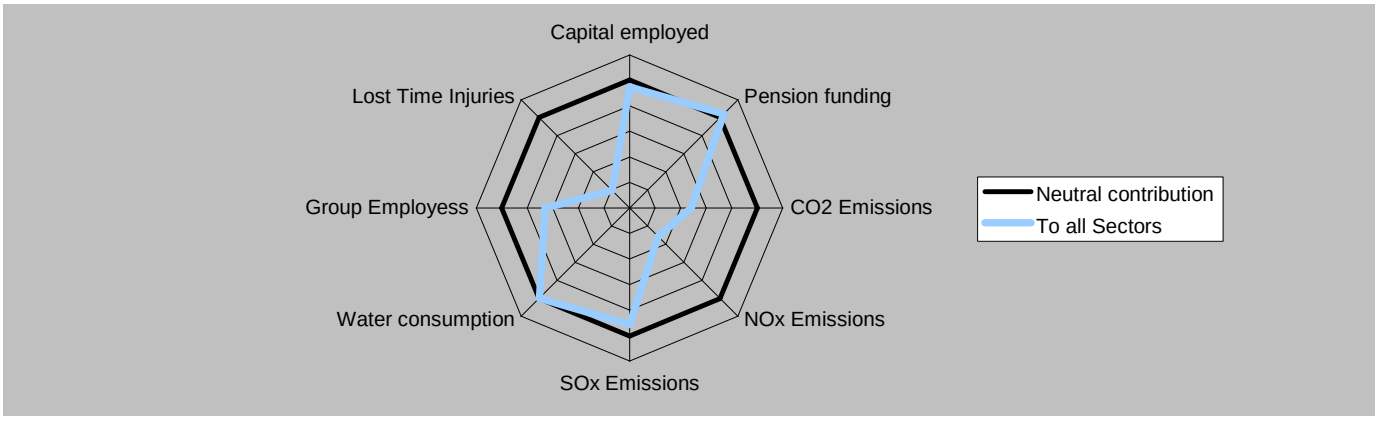
	Opportunity Cost			Value Contribution		
	2004	2005	2006	2004	2005	2006
Capital employed	3'739'809'055 €	5'617'707'124 €	5'957'297'665 €	-808'455'703 €	-1'692'791'554 €	-1'351'563'743 €
Pension funding	1'888'631'643 €	4'397'541'640 €	3'582'898'916 €	1'042'721'710 €	-472'626'070 €	1'022'835'006 €
CO2 Emissions	10'930'863'944 €	15'874'906'769 €	17'571'029'792 €	-7'999'510'591 €	-11'949'991'199 €	-12'965'295'871 €
NOx Emissions	11'530'922'098 €	16'964'306'601 €	21'775'661'249 €	-8'599'568'745 €	-13'039'391'031 €	-17'169'927'328 €
SOx Emissions	3'690'938'426 €	5'955'726'113 €	6'782'058'383 €	-759'585'073 €	-2'030'810'543 €	-2'176'324'462 €
Water consumption	2'196'379'097 €	4'250'920'799 €	4'621'907'980 €	734'974'256 €	-326'005'229 €	-16'174'058 €
Group Employess	7'011'434'018 €	11'616'764'672 €	13'122'886'879 €	-4'080'080'665 €	-7'691'849'102 €	-8'517'152'957 €
Lost Time Injuries	15'643'246'530 €	25'828'674'279 €	24'791'814'136 €	-12'711'893'177 €	-21'903'758'709 €	-20'186'080'214 €

Cross sector results of the Construction & Materials sector

	2004	2005	2006
Sustainable Value	-4'147'674'748 €	-7'388'402'930 €	-7'669'960'453 €
Return to Cost	0.41	0.35	0.38

Performance with regards to specific impact (Return to Cost ratios)

	2004	2005	2006
Capital employed	0.78 €	0.70 €	0.77 €
Pension funding	1.55 €	0.89 €	1.29 €
CO2 Emissions	0.27 €	0.25 €	0.26 €
NOx Emissions	0.25 €	0.23 €	0.21 €
SOx Emissions	0.79 €	0.66 €	0.68 €
Water consumption	1.33 €	0.92 €	1.00 €
Group Employess	0.42 €	0.34 €	0.35 €
Lost Time Injuries	0.19 €	0.15 €	0.19 €



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Industrial Metals

Performance Data	2004	2005	2006
Value	5'633'503'365 €	7'039'184'885 €	7'290'240'027 €
Capital employed	17'746'537'551 €	21'352'704'833 €	22'942'224'208 €
Pension funding	1'015'718'071 €	1'026'263'507 €	745'296'694 €
CO2 Emissions	40'637'480 €	39'087'135 €	42'669'536 €
NOx Emissions	46'071 t	42'585 t	28'899 t
SOx Emissions	112'066 t	97'017 t	89'166 t
Water consumption	177'299'485 t	183'744'951 t	201'181'054 t
Group Employess	69'916	68'293	68'535
Lost Time Injuries	196	154	120

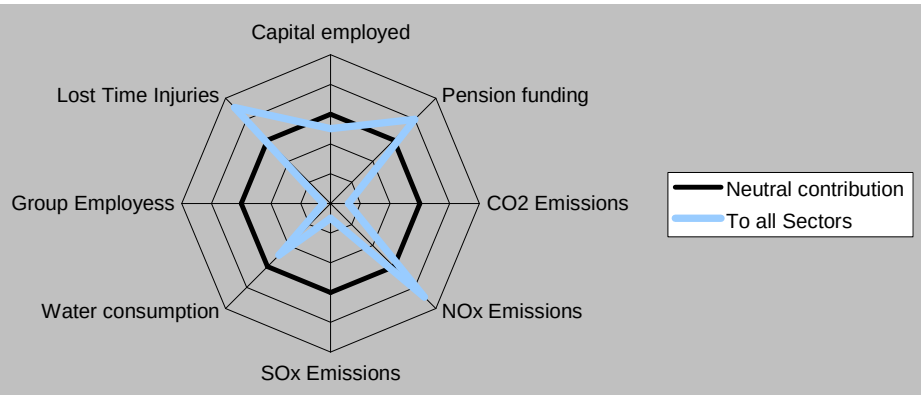
Performance 2006	
SV Contribution	**-1'168'306'100 €**
Return to cost	**0.862**

	Opportunity Cost			Value Contribution		
	2004	2005	2006	2004	2005	2006
Capital employed	5'409'616'668 €	7'715'638'513 €	8'251'914'391 €	223'886'697 €	-676'453'628 €	-961'674'364 €
Pension funding	5'839'723'685 €	7'910'911'704 €	5'313'272'121 €	-206'220'320 €	-871'726'819 €	1'976'967'906 €
CO2 Emissions	8'452'954'583 €	11'397'535'398 €	12'086'076'681 €	-2'819'451'217 €	-4'358'350'514 €	-4'795'836'654 €
NOx Emissions	5'170'901'340 €	5'989'698'383 €	4'399'126'630 €	462'602'025 €	1'049'486'502 €	2'891'113'396 €
SOx Emissions	9'851'052'404 €	11'892'521'956 €	12'270'251'087 €	-4'217'549'038 €	-4'853'337'071 €	-4'980'011'060 €
Water consumption	5'078'137'607 €	7'267'386'000 €	8'396'713'412 €	555'365'758 €	-228'201'115 €	-1'106'473'385 €
Group Employess	9'604'435'415 €	13'202'684'441 €	12'787'267'564 €	-3'970'932'050 €	-6'163'499'556 €	-5'497'027'537 €
Lost Time Injuries	4'833'053'754 €	5'039'598'485 €	4'163'747'128 €	800'449'611 €	1'999'586'400 €	3'126'492'899 €

Cross sector results of the Industrial Metals sector

	2004	2005	2006
Sustainable Value	-1'146'481'067 €	-1'762'811'975 €	-1'168'306'100 €
Return to Cost	0.83	0.80	0.86

Performance with regards to specific impact (Return to Cost ratios)	2004	2005	2006
Capital employed	1.04 €	0.91 €	0.88 €
Pension funding	0.96 €	0.89 €	1.37 €
CO2 Emissions	0.67 €	0.62 €	0.60 €
NOx Emissions	1.09 €	1.18 €	1.66 €
SOx Emissions	0.57 €	0.59 €	0.59 €
Water consumption	1.11 €	0.97 €	0.87 €
Group Employess	0.59 €	0.53 €	0.57 €
Lost Time Injuries	1.17 €	1.40 €	1.75 €



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Mining

Performance Data	2004	2005	2006
Value	5'817'679'864 €	9'059'808'309 €	10'300'125'028 €
Capital employed	20'805'122'618 €	25'215'546'360 €	29'347'768'432 €
Pension funding	161'028'217 €	203'512'920 €	93'960'749 €
CO2 Emissions	26'596'500 €	26'494'000 €	28'036'500 €
NOx Emissions	32'146 t	63'495 t	32'430 t
SOx Emissions	194'987 t	216'883 t	193'136 t
Water consumption	297'767'500 t	316'137'500 t	311'467'500 t
Group Employess	58'300	54'319	60'717
Lost Time Injuries	376	365	454

Performance 2006	
SV Contribution	**-1'047'207'780 €**
Return to cost	**0.908**

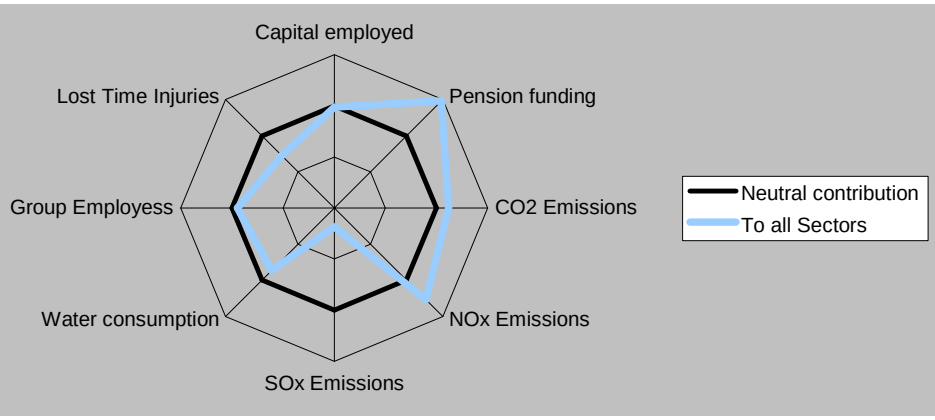
	Opportunity Cost			Value Contribution		
	2004	2005	2006	2004	2005	2006
Capital employed	6'341'954'749 €	9'111'447'104 €	10'555'875'946 €	-524'274'885 €	-51'638'795 €	-255'750'917 €
Pension funding	925'808'370 €	1'568'771'306 €	669'852'731 €	4'891'871'494 €	7'491'037'003 €	9'630'272'297 €
CO2 Emissions	5'532'306'810 €	7'725'465'265 €	7'941'293'110 €	285'373'054 €	1'334'343'045 €	2'358'831'919 €
NOx Emissions	3'607'998'682 €	8'930'656'414 €	4'936'630'194 €	2'209'681'182 €	129'151'895 €	5'363'494'835 €
SOx Emissions	17'140'133'242 €	26'585'827'221 €	26'577'691'088 €	-11'322'453'378 €	-17'526'018'912 €	-16'277'566'059 €
Water consumption	8'528'532'061 €	12'503'708'174 €	12'999'749'653 €	-2'710'852'197 €	-3'443'899'865 €	-2'699'624'624 €
Group Employess	8'008'721'642 €	10'501'155'546 €	11'328'597'881 €	-2'191'041'778 €	-1'441'347'236 €	-1'028'472'853 €
Lost Time Injuries	9'274'735'263 €	11'922'764'292 €	15'768'971'867 €	-3'457'055'399 €	-2'862'955'982 €	-5'468'846'838 €

Cross sector results of the Mining sector

	2004	2005	2006
Sustainable Value	-1'602'343'988 €	-2'046'416'106 €	-1'047'207'780 €
Return to Cost	0.78	0.82	0.91

Performance with regards to specific impact (Return to Cost ratios)

	2004	2005	2006
Capital employed	0.92 €	0.99 €	0.98 €
Pension funding	6.28 €	5.78 €	15.38 €
CO2 Emissions	1.05 €	1.17 €	1.30 €
NOx Emissions	1.61 €	1.01 €	2.09 €
SOx Emissions	0.34 €	0.34 €	0.39 €
Water consumption	0.68 €	0.72 €	0.79 €
Group Employess	0.73 €	0.86 €	0.91 €
Lost Time Injuries	0.63 €	0.76 €	0.65 €



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Oil & Gas Producers

Performance Data	2004	2005	2006
Value	21'846'734'927 €	32'661'511'582 €	32'239'872'415 €
Capital employed	69'788'717'811 €	83'439'742'134 €	81'755'399'426 €
Pension funding	3'605'119'236 €	3'080'391'826 €	5'184'966'280 €
CO2 Emissions	71'007'151 €	71'521'410 €	67'756'212 €
NOx Emissions	179'220 t	183'140 t	183'720 t
SOx Emissions	151'105 t	144'955 t	136'547 t
Water consumption	301'603'150 t	281'471'171 t	224'945'113 t
Group Employess	66'463	64'306	63'802
Lost Time Injuries	202	223	181

Performance 2006	
SV Contribution	**12'250'026'058 €**
Return to cost	**1.613**

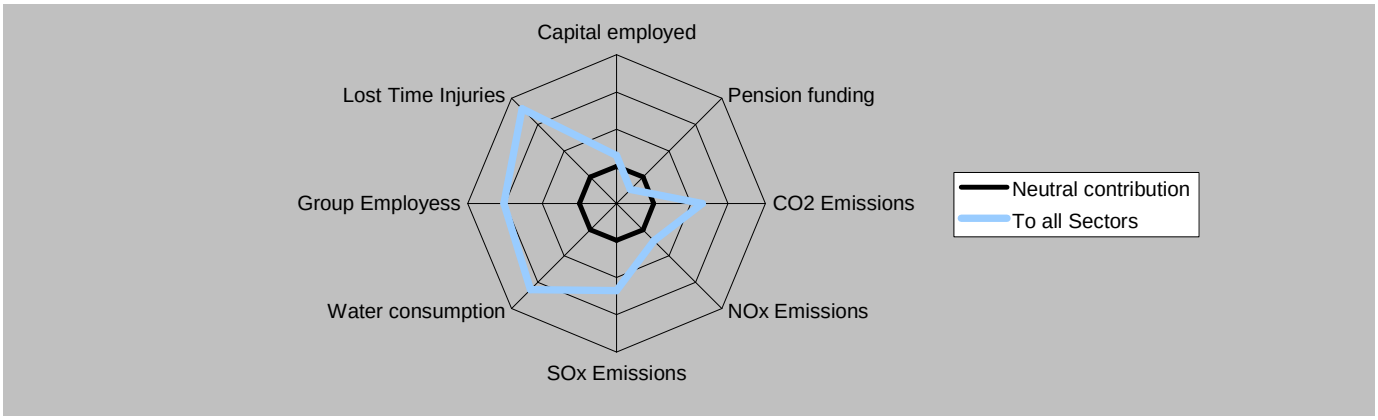
	Opportunity Cost			Value Contribution		
	2004	2005	2006	2004	2005	2006
Capital employed	21'273'457'430 €	30'150'320'203 €	29'405'978'729 €	573'277'497 €	2'511'191'379 €	2'833'893'686 €
Pension funding	20'727'109'999 €	23'745'078'715 €	36'963'986'280 €	1'119'624'928 €	8'916'432'867 €	-4'724'113'865 €
CO2 Emissions	14'770'114'362 €	20'855'143'377 €	19'191'837'171 €	7'076'620'565 €	11'806'368'205 €	13'048'035'244 €
NOx Emissions	20'115'101'774 €	25'759'007'185 €	27'966'585'180 €	1'731'633'152 €	6'902'504'397 €	4'273'287'235 €
SOx Emissions	13'282'689'554 €	17'768'772'911 €	18'790'435'114 €	8'564'045'372 €	14'892'738'671 €	13'449'437'301 €
Water consumption	8'638'391'147 €	11'132'603'311 €	9'388'556'264 €	13'208'343'779 €	21'528'908'271 €	22'851'316'151 €
Group Employess	9'130'040'892 €	12'431'898'899 €	11'904'111'867 €	12'716'694'035 €	20'229'612'684 €	20'335'760'548 €
Lost Time Injuries	4'978'208'640 €	7'284'315'694 €	6'307'280'251 €	16'868'526'286 €	25'377'195'888 €	25'932'592'165 €

Cross sector results of the Oil & Gas Producers sector

	2004	2005	2006
Sustainable Value	7'732'345'702 €	14'020'619'045 €	12'250'026'058 €
Return to Cost	1.55	1.75	1.61

Performance with regards to specific impact (Return to Cost ratios)

	2004	2005	2006
Capital employed	1.03 €	1.08 €	1.10 €
Pension funding	1.05 €	1.38 €	0.87 €
CO2 Emissions	1.48 €	1.57 €	1.68 €
NOx Emissions	1.09 €	1.27 €	1.15 €
SOx Emissions	1.64 €	1.84 €	1.72 €
Water consumption	2.53 €	2.93 €	3.43 €
Group Employess	2.39 €	2.63 €	2.71 €
Lost Time Injuries	4.39 €	4.48 €	5.11 €



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