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Corporate Environmental Governance

A study into the influence of Environmental Governance and Financial Performance full report

Innovest

ENVIRONMENT AGENCY

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The Environment Agency is the leading public body protecting and improving the environment in England and Wales.

It's our job to make sure that air, land and water are looked after by everyone in today's society, so that tomorrow's generations inherit a cleaner, healthier world.

Our work includes tackling flooding and pollution incidents, reducing industry's impacts on the environment, cleaning up rivers, coastal waters and contaminated land, and improving wildlife habitats.

Environment Agency
Project Executive:
Howard Pearce

Environment Agency
Project Manager:
Faith Ward

Written by Andrew White and Matthew Kiernan

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Rio House
Waterside Drive, Aztec West
Almondsbury, Bristol BS32 4UD
Tel: 01454 624400 Fax: 01454 624409

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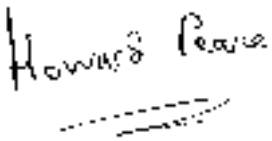
Foreword

For some time there has been debate about how companies manage the environment and the influence this has on business performance. This study seeks to address this issue, by looking at whether there is a link between corporate environmental governance and financial performance.

The study is based on an extensive literature review and 15 case studies. Its conclusion is clear: good environmental governance can benefit financial performance and, conversely, poor performance can have damaging financial consequences.

This clearly has very important implications for financial investors. It means that better financial returns can be obtained from investing in companies which integrate environmental considerations into corporate governance policies and processes.

Some company analysts, institutional pension fund managers and others were rather sceptical of earlier studies. We hope that they will act on these new findings and take greater account of corporate environmental governance in their future decisions.



Howard Pearce

Head of Environmental Finance and Pension Fund Management

October 2004

About Innovest Strategic Value Advisors

Innovest Strategic Value Advisors is an international investment research firm specializing in analysing "non-traditional" drivers of risk and shareholder value, including companies' performance on environmental, social, and strategic governance issues. Innovest has been recognised recently by several dependent commentators as the leading firm in the world in this area.

Founded in 1998, the firm has over US$1 billion under structured sub-advisory mandates with asset management partners including State Street Global Advisors, ING Investment Management including leading European pension funds IDEAM and ABP Investments.

Innovest also provides customised portfolio analysis and research to more than thirty major institutional investors including Hermes, Schroders, Cazenove, and Rockefeller & Co., as well as to leading pension funds in the United States, the U.K., continental Europe, and Scandinavia. Innovest currently has clients in over twenty countries.

The Environment Agency commissioned Innovest Strategic Value Advisors to carry out this study on its behalf. The views and evaluation, particularly of sectors and companies are based on Innovest's research and are not necessarily those of the Environment Agency.

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Acknowledgements

Before we published this report, we invited all the companies in the profiles section to comment on the analysis and conclusions drawn, and to provide any additional relevant research. The Environment Agency and the study authors would like to thank all those companies which responded with comments and further data. This has helped to ensure the accuracy of the case studies.

Executive Summary

The Environment Agency believes that all companies have a duty of care towards the environment. It also maintains that companies which reduce their environmental risks and impacts are more sustainable, profitable, valuable and competitive. We have commissioned this report to shed light on the value of good environmental governance from a buisiness perspective. Our aim is to encourage the wider adoption of sound environmental polices and practices, leading to improved environmental and financial performance.

Overall findings

Good environmental governance helps to deliver better financial performance

In recent years there has been a marked increase in research suggesting that good environmental governance practice can deliver better financial performance.

During the literature review, we found strong evidence for the existence of a positive relationship between environmental governance and financial performance. This result is largely consistent with other literature reviews conducted over the past few years.

> " In 85% of the total number of studies assessed, we found a positive correlation between environmental governance and/or events, and financial performance."

Our work on the individual case studies supported these positive findings from the literature review.

Table 1 The table below lists the case studies included in the full report available on the internet:

Funds	Sectors	Companies
Jupiter Ecology Fund	Integrated oil & gas	3M
Winslow Green Growth Fund	EU and US electric utilities	Baxter International
	Paper and forest products	Co-operative Bank
	Water utilities	Iceland (The Big Food Group)
		Monsanto
		PSA Peugeot Citroen
		Shell
		Xstrata
		Vestas Wind Systems

The comparative studies – in both the literature review and the case studies– provided striking evidence of a positive correlation between environmental governance and financial impacts (see table 2). This impact was most clearly seen in the company studies sourced in the literature review and in the sector case studies (see page 8 and figure 8).

Many in the financial community have yet to recognise the link between environmental governance and financial performance

On the whole, the research findings in this report appear to directly counter a widespread misconception – that paying close attention to an environmental governance strategy and environmental performance is at best a waste of time for investors, and at worst actively harmful to financial returns. In fact the opposite is true. Improving environmental performance is an opportunity for business and can create competitive advantage.

If we are to challenge this misconception in the financial community, we need to get across the results from current research. This is a daunting task. We hope that this report will go some distance towards addressing this. We would encourage mainstream investors to build corporate environmental governance into financial models.

The study

There is an emerging consensus that more prominence should be given to integrating environmental strategies into overall business objectives. However, in some quarters, environmental governance is still not considered to be an important driver.

This paper attempts to assess the validity of these differing viewpoints. It tackles five questions:

- Is there evidence to support a positive link between the environmental governance of individual companies and their financial performance?
- If such a link exists, is it more pronounced in some sectors than in others?
- Is it possible to say which financial performance indicators best illustrate any effect that environmental governance may have?
- Can it be concluded that certain types of environmental governance measures will have an impact on certain financial indicators, and can the longevity of the effect on financial performance be assessed?
- Is the body of research comprehensive in its coverage of environmental governance issues and financial indicators?

There are ***many individual examples of a link to out-performance***:

Table 2 Some examples of the positive findings from our case studies are set out in the table below:

The Winslow Green Growth Fund
The fund has consistently out-performed its benchmark, over a prolonged period. Over one, three and five years, the average annual returns for this fund were, respectively, 20.41%, 5.79% and 11.49% more than the benchmark index.
Forest and paper products sector
Companies with above average environmental governance standards and environmental track record out-performed companies with below average standards by over 43% over a four-year period.
Company case study of 3M
The implementation of a pollution prevention programme yielded total savings of US$894 million from 1975 to 2002.

What is environmental governance?

Environmental governance describes a company's management of its environmental impacts, risks, performance and opportunities. It covers the full range of its best practice approaches (see table 3).

These approaches are reflected in the Environment Agency's corporate environmental governance policy. Environmental governance includes the following key business considerations:

- **Environmental values** (vision, mission, principles);
- **Environmental policy** (strategy, objectives, targets);
- **Environmental oversight** (responsibility, direction, training, communication);
- **Environmental processes** (management systems, initiatives, internal control, monitoring and review, stakeholder dialogue, environmental accounting, reporting and verification);
- **Environmental performance** (use of Key Performance Indicators, benchmarking, eco-efficiency, reputation, compliance, liabilities, business development).

Financial performance indicators

Traditionally, financial indicators were based on figures from management and financial accounts. These are called fundamental indicators. A distinction can be made between financial indicators which are quantitatively derived (traditional 'fundamentals') and 'intangible' values. These do not, as yet, generally appear in company accounts. However, they are very likely to have a financial impact. The indicators considered in the review are set out in table 4 below.

Table 3 For the purposes of the literature review in this report, the following environmental factors were assessed:

Environmental governance		Environmental events
Strategy	Audit/verification	Historic liabilities
Climate change	Accounting/reporting	Spills and releases
Oversight	Eco-efficiency	Toxic emissions
Environmental Management System	Products/services	Hazardous waste
Training	Profit opportunities	Loss of biodiversity

Table 4 The indicators considered in the review:

Fundamental indicators		Intangible indicators
Shareholder value	P/E Ratio	Reputation
Share price	WACC	Innovation
Market cap	ROCE	Competitive advantage
Market share	MVA	Shareholder relations
BMV	EVA	Management quality
EBIT	ROA	Risk avoidance
EBITDA	ROE	
Operating costs	ROIC	

Literature review

In the literature review, we identified 70 separate studies, listed in the full report, which examined the impact of environmental governance on financial performance (see table 5). The focus was on those studies with a strong empirical research content which had been published in the last five to six years. By taking this approach, we attempted to ensure that the findings of the literature review were both meaningful and up to date.

Note: Ten of the 70 studies were themselves literature reviews. These have been referred to for comparative purposes. The statistical analysis in this report was carried out on the other 60 studies identified. These 60 studies each provided a separate analysis of the environmental approach taken by companies, sectors or funds, and of its impact on financial performance.

The Business community is beginning to assess the impact of environmental governance

Twenty-nine of the studies came from academia and 32 were from the business community. Most emanated from North American institutions. It is encouraging that some in the financial community have begun to examine the relevance of environmental governance (See table 6).

This suggests that investors are beginning to recognise the need to carry out empirical investigations into any financial connections.

Some very detailed and cutting-edge work has recently been carried out by or in partnership with financial consultants, leading banks and fund managers. These include ABP, Arthur D. Little, Commerzbank, Pictet, Sarasin and WestLB. Ten of the 60 studies were published by financial institutions.

In each study, the report classifies the nature of the relationship between environmental governance and financial performance. The classification system looks at whether the link was positive, negative or neutral. It is summarised in table 7 below.

Table 5 The table below shows the breakdown of studies reviewed by type:

Fund studies	Sector studies	Company studies	Other literature reviews
15	15	30	10

Table 6 Origin of studies by country and authorship:

	North America	UK	Europe (excluding-UK)	Other	Total
Academia	21	2	5	1	29
Business	18	8	6	0	32
NGO/not-for-profit	3	1	0	0	4
Government	2	0	0	1	3
Total	**44**	**11**	**11**	**2**	

Note – Several of the studies were co-authored by different organisations, based in different countries. The total number of studies in the table above therefore adds up to more than 60.

Table 7 Classification system definitions

Negative correlation	Neutral correlation	Positive correlation
High environmental governance standards but poor financial performance	High environmental governance standards but no change in financial performance	High environmental governance standards and strong financial performance
Low environmental governance standards but strong financial performance	Low environmental governance standards but no change in financial performance	Low environmental governance standards and poor financial performance

The literature review revealed that there are four different approaches to assessing the evidence for the link between environmental governance and financial performance. Evidence comes from:

i) empirical studies looking at the statistical relationship with financial performance;

ii) company, sector or fund case studies;

iii) academic theory/thinking;

iv) research findings from rating agencies and investment managers.

The literature review found strong evidence for the existence of a positive relationship between environmental governance and financial performance.

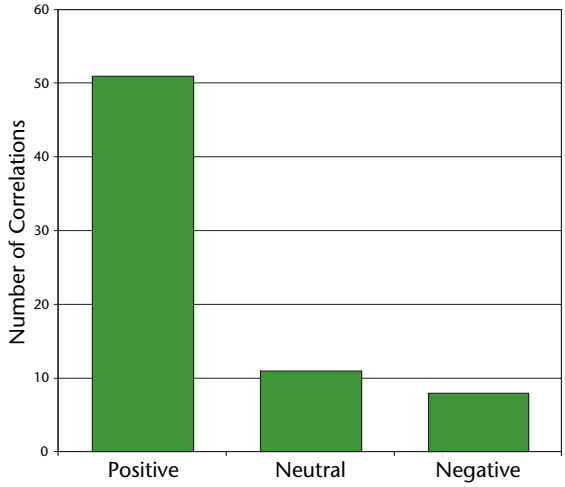
In 51 of the 60 studies reviewed, a positive correlation was found between environmental governance and financial performance (see figure 1).

In other words, in most cases the current research suggests that good environmental governance can deliver financial benefits – and vice versa.

Results from fund, sector and company analyses are all generally positive

The majority of studies demonstrated a positive correlation between environmental governance and financial performance. This was irrespective of whether they were looking at companies, sectors or investment in funds which had an environmental element (see figures 2-4).

Figure 1 Number of positive, neutral and negative correlations found



Note – where a range of environmental governance and/or financial measures are considered in a single study, a combination of positive, neutral and/or negative correlations between different measures is possible within that study's conclusions. The total number of correlations in the chart above therefore adds up to more than 60.

Relationship between environmental governance and financial performance

Figure 2 Company studies

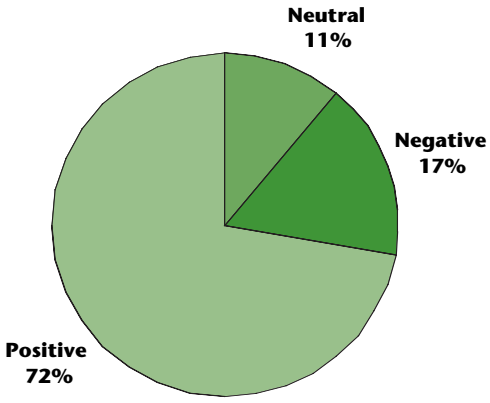


Figure 3 Sector studies

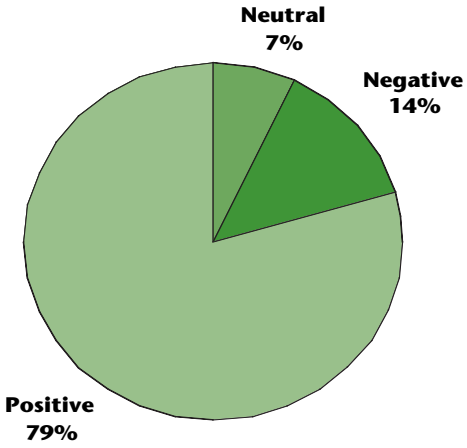
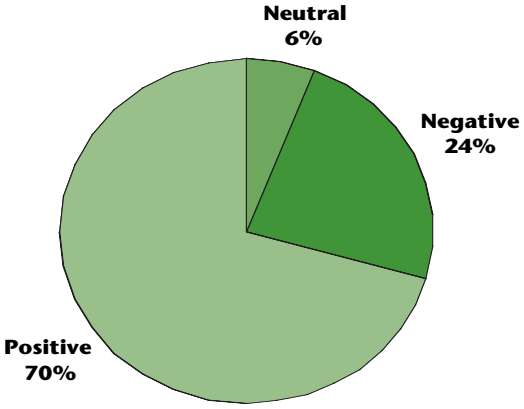


Figure 4 Fund studies



Most of the research looks at the impact of an environmental strategy

A high proportion of the studies examined in the literature review focused on a limited range of environmental governance measures.

In nearly half the studies reviewed, the financial effect of an overarching environmental strategy was the main or only area of analysis (see figure 5).

The different components of an environmental strategy were rarely identified or assessed separately. These components include specific principles, objectives, targets and policy focus.

Climate change strategy is now high on the research agenda

A fifth of the studies looked at the potential benefits of implementing a climate change strategy. Research into the possible opportunities and risks associated with climate change is becoming more common. Climate change is fast becoming the single most prominent environmental issue. This is perhaps not unsurprising given its high profile and the incoming legislation and regulation in areas such as carbon emissions.

The UK Government's Energy White Paper was published in February 2003. It set out a new vision for the country's energy policy and puts the UK on the path to cutting its carbon dioxide emissions by 60% by 2050.

In November 2003, Environment Secretary Margaret Beckett told a City audience that those companies and investors which are well informed about the risks of climate change will be best placed both to protect themselves, and to invest in cleaner technologies.

At the Institutional Investors' Group on Climate Change (IIGCC) conference, the Secretary of State said that climate change is a crucial issue for UK investors and business, and that it represents major opportunities to invest in new cleaner technologies and to trade in greenhouse gas emissions.

Environmental events

The impact of toxic emissions, pollutant spills and releases – and the fines that accompanied them – was the subject of many of the studies (23 and 21 of the 60 studies respectively). Figure 6 below gives the breakdown of the different environmental events considered in the studies included in the literature review.

Figure 5 Number of references to environmental governance issues identified in literature review

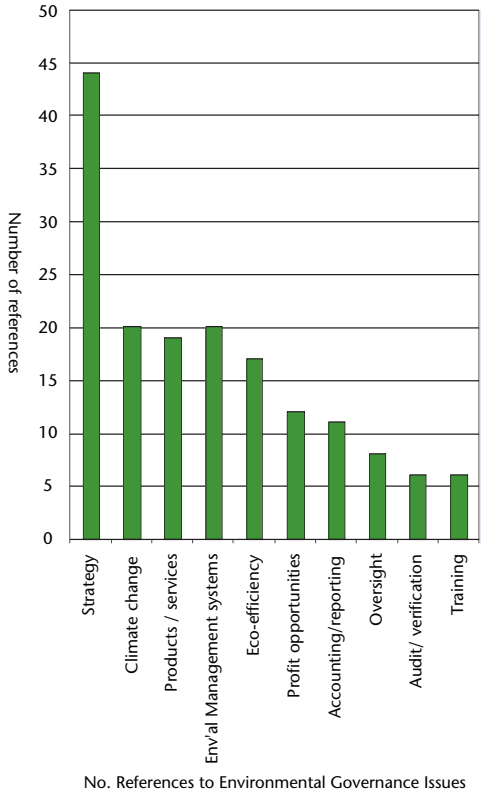
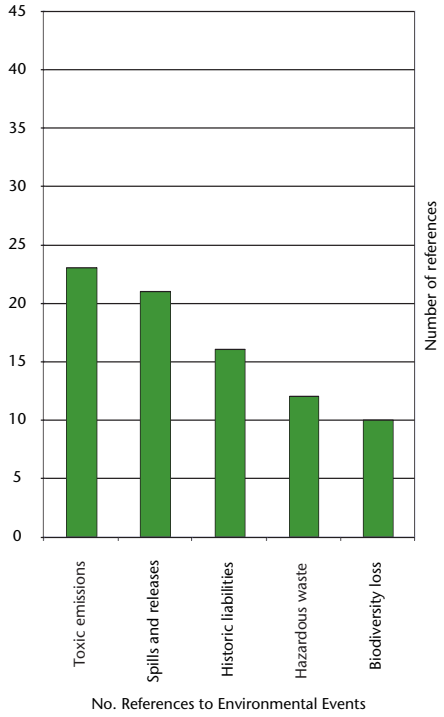


Figure 6 Number of references to environmental events identified in literature review



It is surprising that the impact of different types of pollution incident on financial performance has been assessed far less than the impact of a broad environmental strategy. Financial impacts of fines and penalties can be more directly linked to operating costs and profitability than can overall policy goals. It might therefore be assumed that literature looking at environmental governance would focus more on the relevance of pollution control.

Studies focus on a narrow set of financial indicators

The studies identified in the literature review focused on how environmental governance impacts on just four financial indicators:

i) shareholder value

ii) share price

iii) operating costs

iv) risk and reputation issues.

These indicators represent some of the key tests of financial performance. Using these broad measures of financial performance should help mainstream investors and financial analysts to understand the impact of environmental governance.

Case studies

Although the literature review sourced 30 company studies, only one of these focused on the performance of a single company (Exxon Mobil). To an extent, this result was anticipated. It is one of the reasons we undertook a separate assessment of the performance of individual companies, using 15 case studies (as listed in table 1 above, nine of which looked at individual companies).

The relevance of examining the performance of individual companies was highlighted by a recent case concerning Associated British Ports (ABP), Britain's largest ports operator. In April 2004, ABP saw £155 million wiped off its market value after the UK government blocked the company's plans for a new container terminal at a site in the south of England.

Shares in the company fell by 47p following the announcement, a fall of almost 10% in a single day. The company's plans were for a deep water terminal at Dibden Bay, near Southampton. These were rejected after opposition from environmental campaigners, who claimed it would wreck important wildlife locations. The government admitted that one major factor in its decision was the potential environmental impact of the company's proposals.

Such cases demonstrate very clearly that business strategies are often inextricably linked to environmental issues.

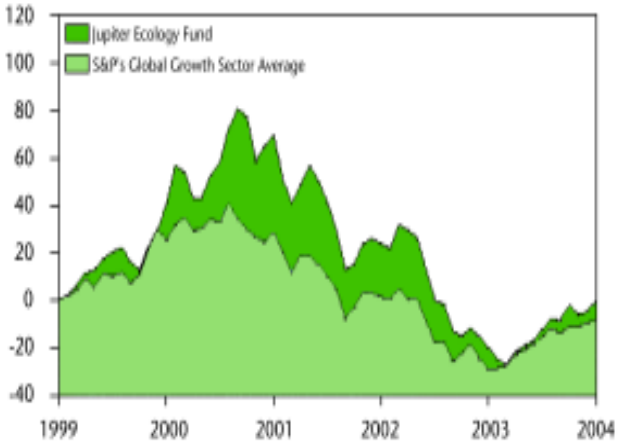
The companies chosen for the individual case studies were selected because, by and large, they had each implemented a different measure of environmental governance. This helps to assess whether certain measures of environmental governance may have related financial impacts. It also means that the case studies look beyond the impact of a broad environmental strategy, which had been the predominant focus of the existing literature.

Many case study examples demonstrate a link between environmental governance and financial performance

The case studies undertaken in this report also show that where environmental governance systems have been implemented, or where environmental performance has been good or has improved, there is evidence of a discernable and beneficial impact on the financial performance of the companies, sectors or funds studied. Some examples are provided below:

- The performance of the Jupiter Ecology Fund has been impressive, giving a better investment return (see figure 7).

Figure 7 Five-year performance chart for the Jupiter Ecology Fund up to 3 November 2003



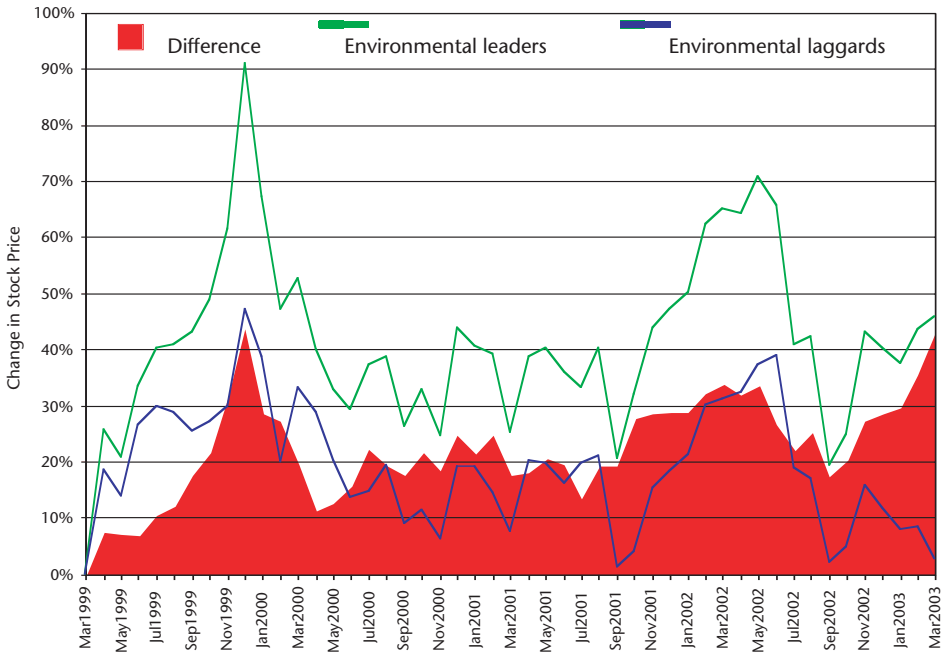
- Forest and paper products companies with above average environmental governance standards and above average environmental track record do well in business terms. They financially out-performed companies with below average ratings by more than 43% (4,300 basis points) over the four years from March 1999 to March 2003 (see figure 8).
- Out-performance was not confined to the best environmental performers in the paper and forest products sector. The companies with the best environmental records/approach also out-performed in the integrated oil and gas, water utilities and EU and US electric utilities sectors.

- In the integrated oil and gas sector, the top environmentally rated firms out-performed laggards by 11.8% over three years and 2.6% over one year.
- Over three years, the stock price of EU electric utilities with above average environmental performance was 39% above that of below average performers. The stock prices of the top and bottom environmental performers in the US electricity sector demonstrated the same pattern.
- In the water utilities sector, environmental leaders out-performed laggard companies by 4.5 percentage points over the three-year period.

Examples taken from the company case studies showed how environmental management in areas such as environmental risk reduction and pollution control impact on direct costs and create savings.

- Baxter International uses systematic monitoring, recording and target setting to reduce environmental risks to business. These improvements saved US$12.7 million in 2002, with cost avoidance at US$52 million. As the table below shows, Baxter's efforts have resulted in a significant reduction of operating costs. In total, environmental efforts saved US$65 million in 2002 (see table 8).
- At 3M, global fines for the company were US$85,000 in 1998 compared to US$253,000 in 1990. Its share price has grown steadily since the company introduced its environmental programme (see figure 9).
- At Monsanto, a long-running lawsuit was recently settled for US$396 million on Monsanto's part. Solutia, previously owned by the former Monsanto, paid up to US$200 million in remediation costs and filed for bankruptcy protection.
- Xstrata's share price fell by about 5% on one day in June 2002. This coincided with news that Japan was considering a coal tax. In 2003, Xstrata published its first sustainability report, revealing new environmental governance structures and policies throughout the company. A follow-up report was published in April 2004. Portfolio diversification has reduced exposure to future carbon risk and there has been a possible improvement in corporate image in terms of its environmental governance, thanks to increased transparency on environmental issues management (see figure 10).

Figure 8 Percentage change in total return of environmental leaders versus laggards in the forest and paper products sector 1999 – 2003



Note – figures and results are based on Innovest proprietary ratings of above and below average performers.

Table 8 The table below illustrates the significant reduction in operating costs from Baxter International's Environmental efforts

	2002	2001	2000
Environmental Costs ($ million)	**23**	**22**	**23**
Environmental Savings ($ million)			
Air Toxics Cost Reduction	0	0	0.1
Hazardous Waste Disposal Cost Reductions	-0.2	-0.2	0.2
Hazardous Waste Material Cost Reductions	-1.2	-0.5	1
Non-hazardous Waste Disposal Cost Reductions	0.6	-0.6	0
Non-hazardous Waste Material Cost Reductions	4	-2.5	3.9
Recycling Income	2.1	1.8	3.5
Energy Conservation Cost Savings	4.3	2.7	2.8
Packaging Cost Reductions	2.9	2.5	1.3
Water Conservation Cost Savings	0.2	0.1	0.1
Total Cost Savings ($ million)*	**13**	**3**	**13**
Cost Avoidance From Efforts Initiated Since 1996 ($ million)	**52**	**57**	**61**
Total Income, Savings & Cost Avoidance ($ million)*	**65**	**60**	**74**

Source: Baxter International (based on estimates)

Figure 9 3M share price (indexed) versus S&P 500 industrial conglomerates (indexed)

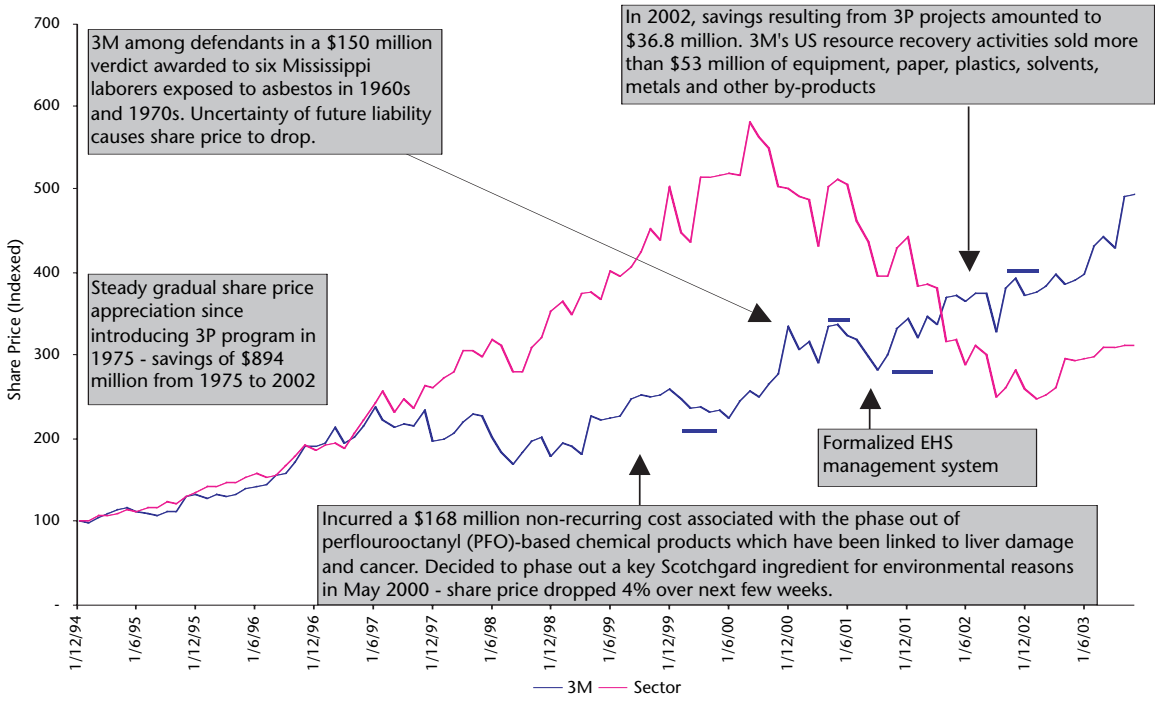
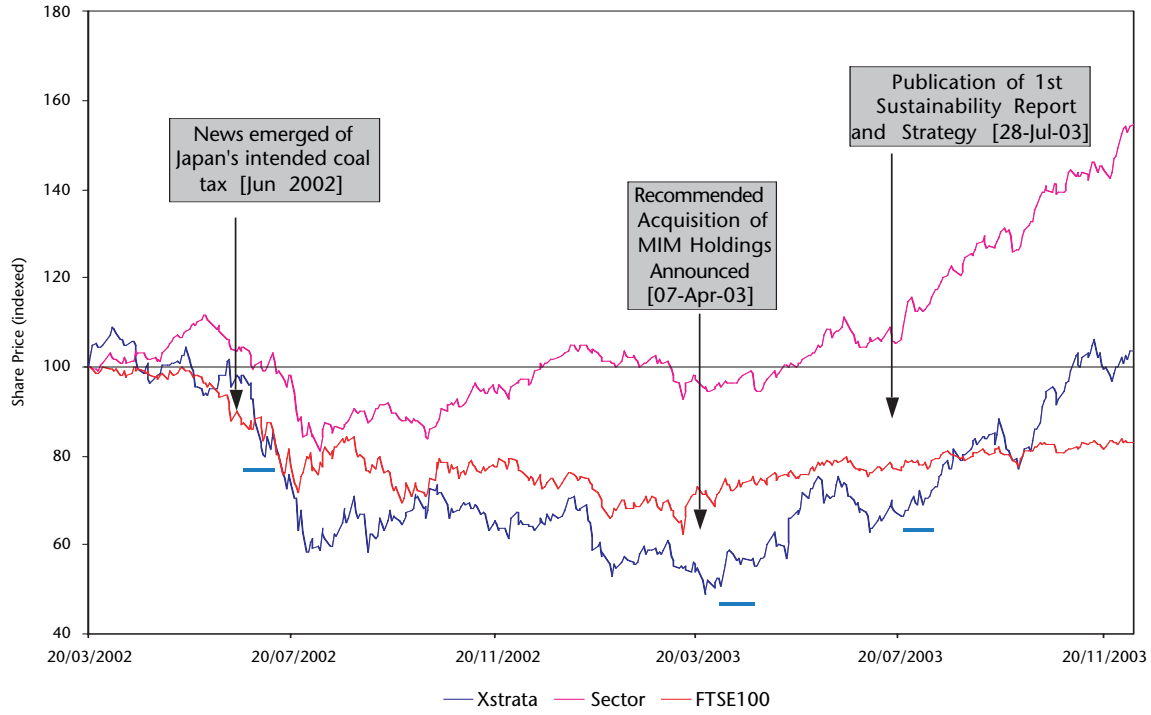


Figure 10 Xstrata share price (indexed) versus World DS Mining (indexed)



Future work

The table below shows that, of the 60 studies in the literature review, only 16 focused on just one or two environmental criteria and an equally small number of corresponding financial impact criteria. (See cells highlighted in **green** in table 9 below.)

Many studies look at a broad range of environmental governance factors and an array of financial impacts. This makes it difficult to pin down the effect of individual environmental governance measures on specific financial measures.

Less than a quarter of the studies in the literature review attempted to assess the impact on financial performance of any kind of problematic environmental event such as a pollution incident. This is surprising: companies in developed markets are now required to operate according to strict environmental standards. They are increasingly liable to pay large fines and remediation costs if they fail to comply with these standards. More research work in this area would be welcome, in order to assess comprehensively the potential impact on financial performance of good versus poor environmental risk management systems.

It is clear that many factors, such as economic and political developments, have a potential bearing on financial impacts and influence the efficacy of good environmental governance. The degree to which the environmental effect may be overestimated is difficult to assess. It has not been tackled to any great extent in the current literature.

Table 9

		Number of financial measures considered				
		1	2	3-5	6-9	10+
Number of studies using only 1 environmental governance measure	18	10	1	7	-	-
Number of studies using 2 environmental governance measures	11	3	2	3	2	1
Number of studies using 3-5 environmental governance measures	16	2	2	11	1	-
Number of studies using 6-9 environmental governance measures	10	1	1	3	4	1
Number of studies using 10+ environmental governance measures	5	1	1	1	1	1
Total	**60**	**17**	**7**	**25**	**8**	**3**

Conclusion

The overall finding from the literature review is that there is strong evidence that where a company has sound environmental governance policies, practices and performance, this is highly likely to result in improved financial performance. The evidence tends to be more compelling when comparative studies are undertaken, with differences in performance between leaders and laggards being quite marked.

The case studies in this report confirm the findings of the literature review, in that changes in financial performance stemming from environmental governance measures can be demonstrated and quantified, although the extent to which these changes is due entirely to environmental governance issues is not always clear.

One area where links can be more clearly established is that of operational impacts. The cost of an eco-efficiency initiative and its financial outcomes can be measured fairly precisely when a company sets up the appropriate environmental accounting and reporting procedures. In the case of 3M and Baxter International, where the impacts could be examined over a longer period of time, it was revealed that a long term environmental governance strategy could yield a continuing financial benefit.

Introduction

The fact that good environmental governance can reduce business risks, many of which can have significant financial consequences, is indisputable. The volume of evidence that implementation of good environmental governance practices has the potential to deliver better financial performance has been growing considerably.

While a consensus is emerging that a higher value is being placed on integration of environmental strategies into overall business objectives, there is still the view in some quarters that environmental governance issues do not represent real drivers of value. This paper attempts to examine the validity of these opposing viewpoints.

The increasing importance of environmental governance

Evidence that implementation of good environmental governance practices can deliver improved financial performance is getting stronger year by year. Advocates of high standards of environmental governance point to a growing body of empirical research that supports the link between sustainable business strategies and above-average financial returns.

This evidence has not gone unnoticed among the power brokers – government, regulators, shareholders and City analysts. Many in these circles would now argue that quality of management, including the ability to control risk, build reputation and enhance shareholder value, is reflected in a broader assortment of performance indicators, with certain environmental measures in the vanguard of these.

A greater understanding of the financial relevance of environmental issues management to business does seem to be changing the way that environmental governance is perceived.

A new agenda from Government and more regulatory action

The UK Government has stated that *'greening business is central to the Government's drive to modernise the economy'* and that this goes *'hand-in-hand with improved competitiveness and creating a knowledge-driven economy.'*[1] To back up this philosophy the Government has taken a number of steps. The climate change levy[2] has been introduced, together with the landfill tax[3] and adoption of packaging waste regulations[4]. The Government has enacted changes to legislation to encourage occupational pension funds to be more transparent about any social, environmental and ethical investment criteria[5]. In support of moves to a more sustainable way of conducting business, the Prime Minister called on all FTSE 350 companies to produce environmental reports by the end of 2001[6] and the Government has published a plethora of guidance documents covering key environmental governance issues such as eco-efficiency, new technologies, environmental reporting and management systems, exploiting environmental technologies, waste management and so on.

As the environmental regulator, the Environment Agency also has a Corporate Strategy and a Green Business Strategy, which sets out its priorities and contribution to sustainable development. The Environment Agency has its own long term vision which takes the view that business will *'reap the benefits of sustainable business practices, improve competitiveness and value to shareholders..'*[7] The Environment Agency measures and reports on the environmental performance of businesses in a number of ways.

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1 http://www.sustainable-development.gov.uk/uk_strategy/factsheets/ukbus/index.htm

2 http://www.hmce.gov.uk/forms/notices/ccl1.htm#P85_3124

3 http://www.hmce.gov.uk/forms/notices/lft1.htm

4 http://www.defra.gov.uk/environment/waste/topics/packaging/

5 From July 2000 pension funds have been required by the revised Pensions Act 1995 to state the extent to which they take social, environmental and ethical considerations into account when they invest money.

6 In his speech to the CBI/Green Alliance Conference (24 October 2000), the PM challenged the top 350 FTSE companies to publish annual environment reports by the end of 2001. This challenge has been reiterated by the Secretary of State for Trade and Industry and the Minister for the Environment.

7 http://www.environment-agency.gov.uk/commondata/105385/cpgreener_world_554150.pdf

The Agency's annual Spotlight report on businesses' environmental performance includes details of the best and worst performers and the Pollution Inventory database gives details of major pollution incidents (see below for further details on the Environment Agency's specific environmental governance perspectives).

Summary of Environment Agency prosecutions and fines, 2002	
Number of events leading to prosecution	1,387
Number of successful charges brought	1,712
Total fines	£3.6 million
Average fine per prosecution (companies)	£8,744
Number of companies fined over £20,000	34
Number of directors incurring personal fine	At least 7
Examples of largest total fines:	
United Utilities Water Plc	£327,500
Anglian Water Services Ltd	£285,000
Thames Water Utilities	£135,000
Shanks Waste Services Ltd	£89,000
Facenda Group (South) Ltd	£75,000

Table 10
Source: Spotlight on business environmental performance, 2002, Environment Agency

Changing approaches to investment in the City

Investors are also beginning to take note of environmental issues, with fund managers such as Baillie Gifford, CIS, Henderson, Hermes, Insight Investment, ISIS, Jupiter, Morley, Standard Life and Schroders among others, acknowledging the potential impact of environmental governance on the bottom line. Many such investors have decided to take a more active engagement and voting role, in order to ensure high standards of environmental oversight and performance, taking the view that this should safeguard and enhance their investments. A number of 'green' funds apply an environmental overlay or screen in the belief that environmental performance is linked to financial performance.

A recent survey by Business in the Environment (BiE)[8] – sponsored by the Environment Agency – showed that UK investor attitudes towards environmental governance are changing. Appreciation of corporate environmental responsibility issues had grown among analysts and other City groups. Two Europe-wide surveys of institutional investor attitudes were published in 2003[9]. While both surveys were concerned primarily with SRI and CSR at a broad level, both surveys found that increasing prominence is being given to environmental and social issues management and that this trend is likely to continue. The CSR Europe/Deloitte/Euronext survey reported that 79% of fund managers and analysts thought that environmental risk management had a positive impact on a company's long term value (but no short term impact). 52% of fund managers and analysts thought that environmental considerations would become a significant aspect of mainstream investment decision-making in the next two years.

At the global level, a survey published in June 2004 confirms this view. In this new report from the United Nations Environment Programme (UNEP)[10], a group of 12 fund managers representing US$1.6 trillion of assets under management called on investors, government and business leaders to place environmental, social, and governance best practice at the heart of financial markets. Leading brokerage houses undertook the work for the UNEP FI group and concluded that aviation, insurance, oil and gas, and utility companies face material threats linked to climate change while some sectors were witnessing evolving opportunities in the form of new 'Carbon Markets.'

[8] Investing in the Future: City attitudes to environmental and social issues, 2001

[9] Socially Responsible Investment among European Institutional Investors, Eurosif, 2003; Investing in Responsible Business, the 2003 survey of European fund managers, financial analysts and investor relations officers, CSR Europe/Deloitte/Euronext

10 . "The Materiality of Social, Environmental and Corporate Governance Issues to Equity Pricing" report was launched at the United Nations Global Compact Leaders Summit in New York, 24 June 2004. The report is based on eleven sector reports by brokerage house analysts and was produced for the UNEP Finance Initiative Asset Management Working Group.

Brokerage houses contributing sector research for the UNEP FI report included some high profile names such as ABN AMRO Equities (UK); Deutsche Bank Global Equity Research and South African Equity Research; Dresdner Kleinwort Wasserstein Europe and UK; Goldman Sachs European Equity Research; HSBC; UBS Global Equity Research and West LB Equity Markets. The 12 financial institutions that worked with UNEP on the report also included some prominent players from around the globe such as BNP Paribas Asset Management, France; Citigroup Asset Management, USA; Morley Fund Management, UK; Storebrand Investments, Norway; ABN AMRO Asset Management, Brazil HSBC Asset Management, Europe.

While the message is emerging that a higher value is being placed on integration of environmental strategies into overall business objectives, in practice there is still the fairly deeply rooted view in many quarters that environmental governance issues are not considered that relevant as drivers of value. This was another conclusion which could be drawn from the BiE survey which also found that, when prompted for a spontaneous answer, just 3% of analysts and 4% of investors mentioned these factors as things they would take into account.

The Environment Agency approach

In its response to the Company Law Review, the Environment Agency developed its own policy on corporate environmental governance. The Environment Agency believes that companies have a duty of care towards the environment and that FTSE listed companies should summarise their environmental performance in their annual report and accounts.

In terms of the commercial imperatives linked to good environmental governance, the Environment Agency consider companies that reduce environmental risks and impacts to be more sustainable, profitable, valuable, and competitive. The Environment Agency believe this makes good sense for the economy, companies and investors alike, as well as for the environment (described in this report as the 'win-win' situation). Equally, the Environment Agency believes those companies that ignore environmental risks and impacts are less sustainable in any scale but in the very short term are likely to be less profitable, valuable, and competitive. This is potentially bad for the economy, companies, investors and the environment (the 'lose-lose' situation).

In short, the Environment Agency aims to praise the good environmental performers and seek to change the behaviour of poor performers. The Environment Agency has commissioned this report, to shed some light of the value of good environmental governance from a business perspective, and thereby encourage more widespread adoption of sound environmental policies, practices and lead to improved environmental and financial performance (full details on the Agency's view on the role of environmental governance can be found on the Agency web site - - www.environment-agency.gov.uk).

What the report is hoping to achieve

While there is a growing belief that environmental governance and financial performance are connected, the jury still seems to be out – in the mainstream investment community at least – as to whether or not this view can be substantiated. As one study author put it:

'After a generation of experience with environmental issues, regulations, and management efforts, an active debate has emerged over whether environmental activities are value-adding or value-destroying. The debate divides into two theories: the Cost Center and Value Creation. The former argues that environmental issues represent primarily increased cost and offer little positive potential for shareholders. The latter view is that the environment presents a new lens through which companies can identify and realize new sources of competitive advantage and improved financial returns' [11]

To address this debate, many studies have been undertaken in recent years, as well as several other literature reviews, but much of the research to date has concentrated on the possible benefits to be derived from pursuing a broad sustainable business strategy. It is the view of the authors that less research has been undertaken to try and bring together the results of studies which have focused exclusively or predominantly on environmental governance.

[11] The Emerging Relationship between Environmental Performance and Shareholder Wealth, Ralph Earle, 2002

So one of the goals in this report is to isolate research into the impacts of environmental governance from other strands of research carried out in the SRI field. By focusing on environmental governance measures and associated financial impacts, the report aims to ensure that findings are closely aligned with the work of the Environment Agency. The report seeks to identify commonalties as well as limitations of the work undertaken so far by academia and the financial industry. Areas for further research will be highlighted.
The report will also play a role in informing Environment Agency thinking in the development, promotion and implementation of strategy and action plans aimed at influencing the environmental governance policies of companies and financial institutions in the UK. In summary, this report seeks to tackle the following five questions:

- ❒ Is there evidence to support a positive link between the environmental governance of individual companies and their financial performance?
- ❒ If such a link exists, is it more pronounced in some sectors than in others?
- ❒ Is it possible to say which financial performance indicators best illustrate any effect environmental governance may have?
- ❒ Can it be concluded that certain types of environmental governance measures will have an impact on certain financial indicators and can the longevity of the effect on financial performance be assessed?
- ❒ Is the body of research comprehensive in its coverage of environmental governance issues and financial indicators?

For the purposes of this study, it was decided that a fresh literature review would be undertaken, supported by some new research in the form of a series of case studies. The objective of the literature review is to provide an assessment of current thinking which links environmental governance to a company's share price and financial performance. By undertaking new case studies, the report seeks to bring some additional analysis to the body of literature already available.

This report has been compiled by Innovest Strategic Value Advisors (please see Appendix for further information on the authors).

How environmental governance is defined

The term environmental governance is defined as encompassing the full range of best practice approaches to the management by companies of their environmental impacts, risks, performance and opportunities. These approaches are reflected in the Environment Agency's corporate environmental governance policy[12].

Environmental governance includes the following key business considerations:

- **Environmental values** (visions, mission, principles);
- **Environmental policy** (strategy, objectives, targets);
- **Environmental oversight** (responsibility, direction, training, communication);
- **Environmental processes** (management systems, initiatives, internal control, monitoring and review, stakeholder dialogue, reporting and verification);
- **Environmental performance** (use of KPIs, benchmarking, eco-efficiency, reputation, compliance, liabilities, business development).

All these key criteria match the environmental metrics which have been devised by leading organizations and other authorities in this field, subsequently adopted by many corporate entities and which also form the basis for many of the research studies undertaken by others.

The Department for Food, Environment and Rural Affairs (Defra) for example, has produced a general set of guidelines that set out how to produce a good quality environmental report. In addition Defra[13] has published separate guidelines on how to measure and report on the three key

12 http://www.environment-agency.gov.uk/commondata/105385/ag_policy.pdf
13 http://www.defra.gov.uk/environment/envrp/index.htm

impacts common to all companies: greenhouse gas emissions, waste, water use. Extensive sets of environmental governance criteria have been developed by organisations such as the GRI[14]; with guidance on implementation from sources such as the AA1000 process model[15] and the EFQM excellence model[16].

The structure of the report and the methodology used

Our report is divided into two parts. The first half of the report presents the findings of the literature review. The second half provides a series of case studies, numbering 15 in total. These case studies have been selected to provide some new and unique insights into the impact of environmental governance factors on financial performance, looking at quantifiable links to share price performance in particular.

The literature review summarises the evidence for a positive, negative or neutral correlation (see below for a definition of these correlations) between environmental governance and financial performance. The review also considers which environmental governance measures and which financial indicators have been used most frequently in recent work in this area. The review provides some extracts from the studies found, to demonstrate the strength of any connections which have been put forward.

The studies included in the literature review are drawn mainly from the UK and the US, with some additional international publications. The scope of the review was pre-defined to include studies published within the last five years, and using a fairly short time frame helps to ensure that all the latest thinking and research findings in this area are taken into consideration.

It is worth noting that the literature review seeks to identify links based on empirical evidence. For the purposes of this report, the main focus has not extended to include papers that are interested primarily in making a business case based on a more ethical agenda or which are based largely on a more subjective or theoretical type of analysis.

Many of the studies sourced did not focus solely on environmental governance, but encompassed a whole host of CSR issues. Some of these studies were included in the literature review where it was considered that they presented results that distinguished between the impact on financial performance of environmental and other CSR factors. Studies which looked at a range of SRI/CSR factors, or which looked at the performance of SRI funds, were generally excluded from the literature review. This is on the basis that environmental governance as a driver of financial performance was just one of many other SRI/CSR factors considered in those studies and its impact on financial performance was not analysed separately. The reason for this approach is that the Environment Agency is particularly interested in assessing the role of environmental rather than social drivers of value.

The report includes company-based studies (which examine private or publicly listed companies, the latter usually within a leading index of shares such as the FTSE 350 or S&P500), sector-based studies (which look at one or more industries, such as mining or integrated oil and gas) and investment-based studies (which examine pure 'green' funds or funds with an environmental overlay). A number of other literature reviews that were wholly or largely relevant to the impact of environmental governance on financial performance were identified. An assessment of the findings of other literature reviews is useful for comparative purposes.

The report also classifies the nature of the relationship between environmental governance and financial performance in each study, according to whether the link was positive, negative and neutral. The classification system is summarised in the table below.

14 http://www.globalreporting.org/divers/environment.asp
15 http://www.accountability.org.uk/aa1000/default.asp
16 http://www.efqm.org/model_awards/model/excellence_model.htm

Negative correlation	Neutral correlation	Positive correlation
High environmental governance standards but poor financial performance	High environmental governance standards but no change in financial performance	High environmental governance standards and strong financial performance
Low environmental governance standards but strong financial performance	Low environmental governance standards but no change in financial performance	Low environmental governance standards and poor financial performance

Table 7

The approach taken for the company-specific case studies has been to select companies of varying sizes and global reach. So for example at one end of the spectrum is Shell, a long-established, FTSE100 listed global energy company with a wide range of products, while at the other is Vestas Wind Systems, a new and relatively small player in the energy market listed on the Copenhagen Stock Exchange and offering a single, niche market product.

Similarly, the report sought to analyse sectors with varying environmental impacts. This approach should help to say whether the correlation between environmental governance and financial performance is stronger in certain sectors than in others. So while two case studies on energy companies have been included, sectors such as financial services (e.g. Co-operative Bank) and manufacturing (e.g. 3M) have also been covered.

Another factor for consideration in all the case studies was the extent to which there was current and high quality data available, and all the companies considered publish detailed information on their environmental governance standards and performance.

For the sector case studies, the approach taken was to compare the financial performance of companies with high standards of environmental governance with that of companies with weaker approaches to environmental governance, compared to peers[17].

17 Sector classifications in line with MSCI sector classifications. Assessment of the quality of environmental governance standards was based on Innovest ratings (the Innovest methodology is also explained in the Appendix). NB - inclusion of Innovest rating results does not represent an endorsement of the ranking of any company profiled in this report).

Literature Review

A wide range of environmental governance measures has been assessed in recent studies

Environmental governance measures, such as implementation of an environmental strategy or an environmental management system, represent an on-going challenge to an organisation. They remain a challenge because if implemented successfully, they should be able to help companies to avoid environmental risks, achieve cost savings and potentially exploit new business opportunities.

Studies which look at these measures have generally undertaken a regression analysis, measuring financial impacts over time. Other studies focus on one-off environmental events or historic liabilities and look at the impacts of particular incidents, such as polluting a local habitat, which may result in a financial penalty. Table 3 shows each of the environmental factors assessed in the literature review.

Environmental governance		Environmental events
Strategy	Audit/verification	Historic liabilities
Climate change	Accounting/reporting	Spills and releases
Oversight	Eco-efficiency	Toxic emissions
Environmental Management System	Products/services	Hazardous waste
Training	Profit opportunities	Loss of biodiversity

Table 3

Many different financial indicators have been considered

A distinction can be made between financial indicators which are quantitatively derived (traditional 'fundamentals') and 'intangible' values (which do not, as yet, generally appear in company accounts, but which are very likely nonetheless to have a financial impact). The indicators considered in the review are set out in table 4.

Fundamental indicators		Intangible indicators
Shareholder value	P/E Ratio	Reputation
Share price	WACC	Innovation
Market cap	ROCE	Competitive advantage
Market share	MVA	Shareholder relations
BMV	EVA	Management quality
EBIT	ROA	Risk avoidance
EBITDA	ROE	
Operating costs	ROIC	

Table 4

A total of 70 studies relevant to this report were identified. 10 of these studies had also reviewed current literature. The statistical analysis shown in this report relates to the 60 studies that were not undertaking a literature review. This approach allows for an assessment of relevant literature according to the three main survey categories (companies, sectors, funds).

This number of surveys identified may seem a small, but as mentioned above these are studies which have been published in the past five years or so only, 1997/8 – 2003/4 and which exclude more broadly-based CSR/SRI analyses. In addition, the report focused on studies where a statistical analysis had been carried out, rather than relying on anecdotal evidence, as this was felt to provide a more rigorous understanding of environmental governance connections to financial performance.

A further 24 related studies were reviewed but it was decided they were not wholly relevant under the terms of reference. The table below shows the breakdown of studies reviewed by type.

Fund studies	Sector studies	Company studies	Other literature reviews
15	15	30	10

Table 5

51 of the 60 studies reviewed found a positive correlation between environmental governance / events and financial performance

The literature review found strong evidence for the existence of a positive relationship between environmental governance and financial performance. In 51 of the 60 studies, 85% of the total number, a positive correlation between environmental governance / environmental events and financial performance was found.

These results are largely consistent with other literature reviews that have been conducted over the past few years. 9 of the 10 other literature reviews considered found individual studies showing either a positive and/or neutral effect, with only 4 of the literature reviews unearthing studies demonstrating a negative impact.

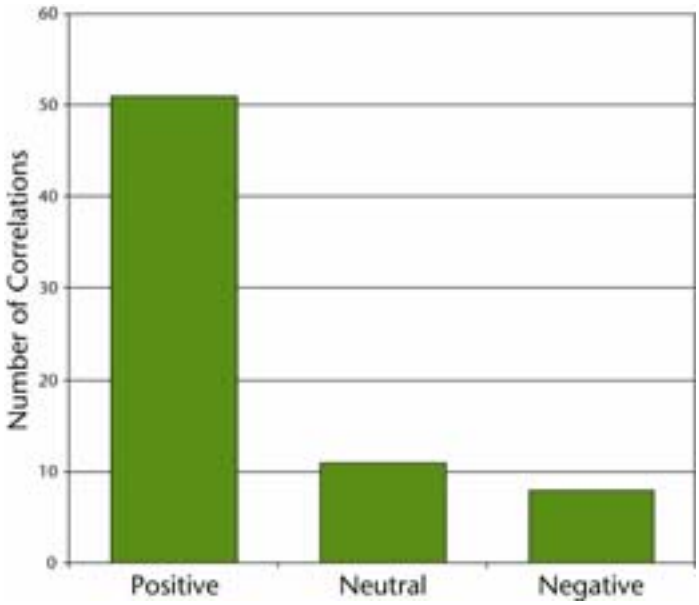
A small number of the studies, 11 in total, found a neutral effect, while 8 studies concluded that implementation of environmental governance measures could in fact be damaging to financial performance.

Note – where a range of environmental governance and / or financial measures are considered in a single study, a combination of positive, neutral and / or negative correlations between different measures is possible within that study's conclusions, hence the total number of correlations in the chart above adds to more than 60.

The overall breakdown of the types of correlations found is in this study is described in figure 1 below.

Figure 1

Number of Positive, Neutral and Negative Correlations Found



Most studies undertaken in the US, while the UK and rest of Europe are lagging behind

Studies of North American companies and industry sectors featured very strongly and this reflects the fact that most of the recent environmental governance studies have been carried out in the US itself.

Of the 60 studies, 44 were published by authors from institutions and other organisations North America, though a few of these were co-authored with UK and other EU institutions. Only 7 of the studies had been published / undertaken solely by UK organisations (4 more in partnership with non-UK authors).

The only UK studies were:

- 'Risking Shareholder Value? ExxonMobil and Climate Change', Claros Consulting;
- 'The Link between Company Environmental and Financial Performance', Earthscan;
- 'Emissions Trading - Carbon Derby', Dresdner Kleinwort Wasserstein;
- 'Climate Change and Aviation', Schroder Investment Management;
- 'The Benefits of Corporate Sustainability and Responsibility', Environmental Finance;
- 'Green with Envy', Commerzbank Securities;
- 'Does Ethical Investment Pay?', Eiris.

29 of the studies came from academia while 32 were from the business community, with most emanating from North American institutions

It is encouraging that some in the financial community have begun to examine the relevance of environmental governance. This suggests that investors are beginning to recognise that empirical investigation into any financial connections is now becoming more imperative.

Some very detailed and cutting edge work has been carried out recently by or in partnership with consultants, leading banks and fund managers, such as ABP; Arthur D. Little; Commerzbank; Pictet; Sarasin; WestLB. 10 of the 60 studies were published by financial institutions.

	North America	UK	Europe (excluding UK)	Other	Total
Academia	21	2	5	1	29
Business	18	8	6	0	32
NGO/not-for-profit	3	1	0	0	4
Government	2	0	0	1	3
Total	**44**	**11**	**11**	**2**	

Table 6

Note – Several of the studies were co-authored by different organisations, based in different countries, hence the total number of studies in the table above adds to more than 60.

A positive link between environmental governance and financial impact in 26 of the 30 company surveys

In a high proportion of the company studies, 26 of the 30 identified, there was a positive correlation between environmental governance and financial performance. We also found that the majority of the company-based studies considered some or all of the constituents of a full index of leading shares such as the S&P500, rather than individual companies.

Company studies showing neutral or negative correlations

In *'A Resource-based Perspective on Corporate Environmental Performance and Profitability'*, Russo and Fouts, 1997, the authors wanted to test the view that environmental performance and economic performance are positively linked. The study tested this hypothesis with an analysis of 243 firms over two years, using independently developed environmental ratings. The authors found that environmental variables do not account for more than a modest level of variation in firm performance. This paper also referenced a number of other empirical studies which have shown no significant link between measures of environmental performance and profitability.

Waddock and Graves, in *'Finding the Link between Stakeholder Relations and Quality of Management'*, 1997 compared the relationship between management quality and treatment of specific stakeholder issues. Treatment of the ecological environment was not found to be significantly related to quality of management in any of the models. The authors concluded that the environment was not an important factor in developing a reputation for quality management. The lack of significance of environmental concerns may have been related to a general lack of awareness of the relevance of environmental issues to the corporate world. At the time, environmental awareness among corporations was still a relatively recent phenomenon.

Company studies showing positive correlations

'The Link between Company Environmental and Financial Performance' by Edwards, D., from 1999, looked at quantitative links between environmental and financial performance for the UK's best and worst environmental performers across a range of sectors. It demonstrated there is no financial penalty for being environmentally proactive and confirmed many findings from studies in the US that good environmental performance improves financial performance.

In *'Contemporary Environmental Accounting: Issues, Concepts and Practice'*, Earthscan, 2000, there is a chapter on environmental shareholder value and environmental issues. It notes improved EMS and performance can reduce systematic risk by approximately 13% and refers to a study into the effects of the Superfund in the US, which found that 62.5% of banks analysed had rejected loan applications because of the possibility of environmental liability.

A very positive relationship was also found when industry sectors were considered

As regards sector studies, again a majority of the studies, 12 of the 15, found a positive correlation between environmental governance and financial performance. Only 1 sector study found a negative link, and other positive links were also identified in that paper. The findings of the sector case studies support this positive relationship. In the forest and paper products sector case study for example, extreme variations in performance levels were detected, with good governance appearing to be closely linked to strong financial out-performance, and vice versa.

Strong evidence that investing using an environmental governance overlay can deliver out-performance

Of the 15 investment-based studies, 13 found a positive correlation between environmental governance and financial performance.

This study also chose to look at two 'green' funds in the case studies section of this report, and again identified some fairly positive links overall.

Investment studies showing neutral or negative correlations

In their '*Performance Review: Profit-Driven Sustainability Funds'*, Lou and Ganzi, 2001, produced a study into forms of pooled investment vehicles that used social, ethical and, particularly, environmental (SEE) performance criteria and financial and risk assessment analysis. The data collected showed that only 23 out of 63 funds (37%) outperformed their benchmark in 2001. It appears that many of the funds may have had a heavy emphasis on technology companies, and suffered sharper losses because of it. This was a reversal of Ganzi's previous review, in which 19 out of 26 funds (73%) outperformed their respective benchmarks.

Sector studies showing positive correlations

In an academic article called *'Risk Premiums for Environmental Liability: Does Superfund Increase the Cost of Capital?'*, 1998, Garber and Hammitt, argued that Superfund liability may impose a financial risk on investors and increase firms' costs of capital. Monthly stock returns were analysed for 73 chemical companies using several measures of Superfund exposure. Exposure increased costs of capital for larger firms, but less so for smaller firms. From 1988 to 1992, an average increase cost of capital was estimated for 23 larger firms of between 0.25 to 0.40 percentage points per year.

In *'Pure Profit: the Financial Implications of Environmental Performance'*, Austin and Repetto, 2000, the authors estimated the economic impact of environmental risks to 13 major US pulp and paper companies, using discounted cash flow analysis. The study found that net impact of environmental exposure ranged from +2.9% to -10.8% of firms' market capitalisation (median -6.8%).

Investment studies showing positive correlations

In *'The Eco-Efficiency Premium in the US Equity Market'* by Erasmus University of Rotterdam, Rotterdam School of Management; ABP Investments, 2003, the empirical results provided evidence that environmental responsibility is rewarded in the market. A portfolio ranked high on environmental governance outperformed its low-ranked counterpart by 4% annually. This performance gap widened to 9.5% and became statistically significant once industry-effects were accounted for. Given that the observed differential was neutral with respect to risk, investment style and industry exposure, it is possible to interpret this result as evidence of an 'eco-efficiency premium' in the US equity market.

In '*The Eco-efficiency Anomaly'*, Blank and Daniel, 2002, performance of stocks ranked highly on environmental governance criteria was reviewed. Authors concluded that a portfolio of highest-rated companies outperformed a portfolio of all rated companies. Stocks rated highly on their environmental governance outperformed low-rated ones in environmentally sensitive industries such as chemicals, forest products, mining, and steel.

Research focus has been on share price and shareholder value impacts

Our study also set out to ask whether there are particular environmental governance measures which have an impact on certain financial indicators. As a first step, it is useful to consider which financial indicators are most commonly cited in the literature. Shareholder value – the exact meaning of which is not always clearly explained in many research studies – was found to be the most frequently used financial indicator, with 48% of the studies examining impacts on this measure. Share price was a close second, examined in 47% of studies. 37% of the studies considered the effect on operating costs, while 35% examined the impact on a more intangible measure, namely risk avoidance.

These results are very much in line with other literature reviews which have been carried out in the past five years. They also found that most studies focused on environmental governance impacts on the same four financial measures: shareholder value, share price, operating costs and risk and reputation issues.

Nearly all the studies looked at environmental governance as a strategic management issue, event studies less common

The literature focuses strongly on on-going environmental governance measures, rather than on environmental events. 54 of the 60 studies examined the financial impact of at least one type of on-going environmental governance measure. Less than half of the studies, 28 in total, considered the impact of an environmental event such as a toxic release.

Testing the impact of an overall environmental strategy is most common approach

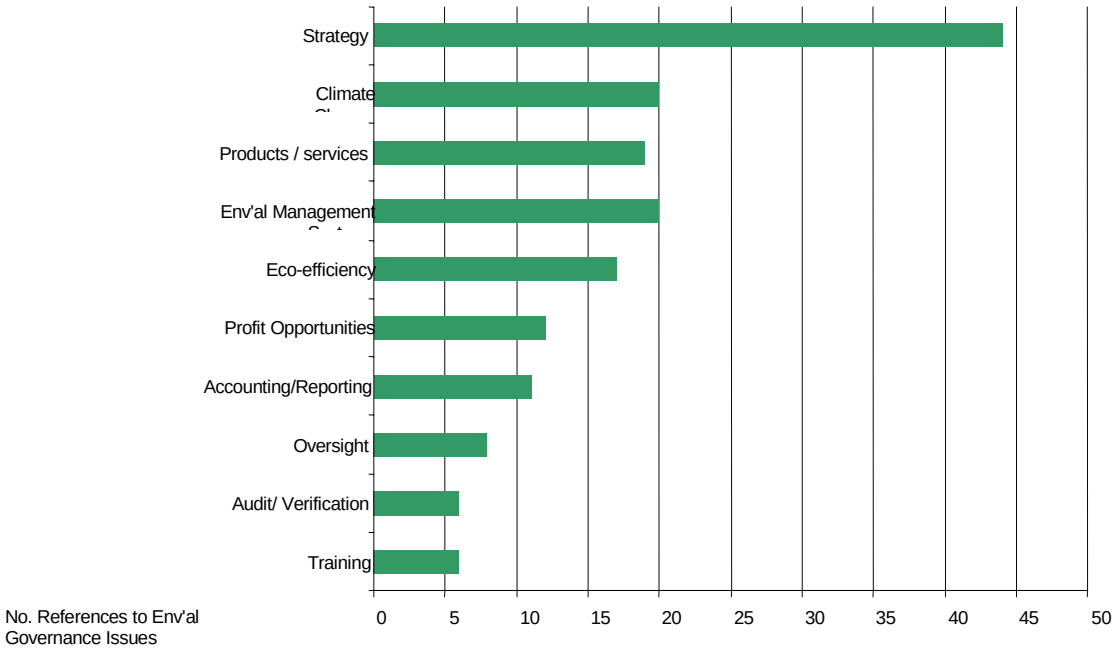
Our review found that while the range of environmental governance issues used in the literature is broad, the focus is very much on environmental policy issues (e.g. environmental strategy) and to a lesser extent on operational issues (e.g. EMS and eco-efficiency).

In 44 of the 60 studies, reference to environmental strategy was found. Many of the studies take a very broad view of environmental governance, rather than focusing on specific measures. The possible impacts of climate change also featured strongly, as did development of environmental products/services/technologies, use of an EMS and eco-efficiency measures.

The prominence of the various environmental governance issues found in the literature review is shown in figure 5 below.

Figure 5

Number of References to Environmental Governance Issues Identified In Literature Review



The impact of toxic emissions and pollutant spills and releases – and the fines that accompanied them – was the subject of 23 and 21 of the studies respectively. Figure 6 gives the breakdown of the different environmental events considered in studies included in the literature review:

Figure 6

Number of References to Environmental Events Identified In Literature Review

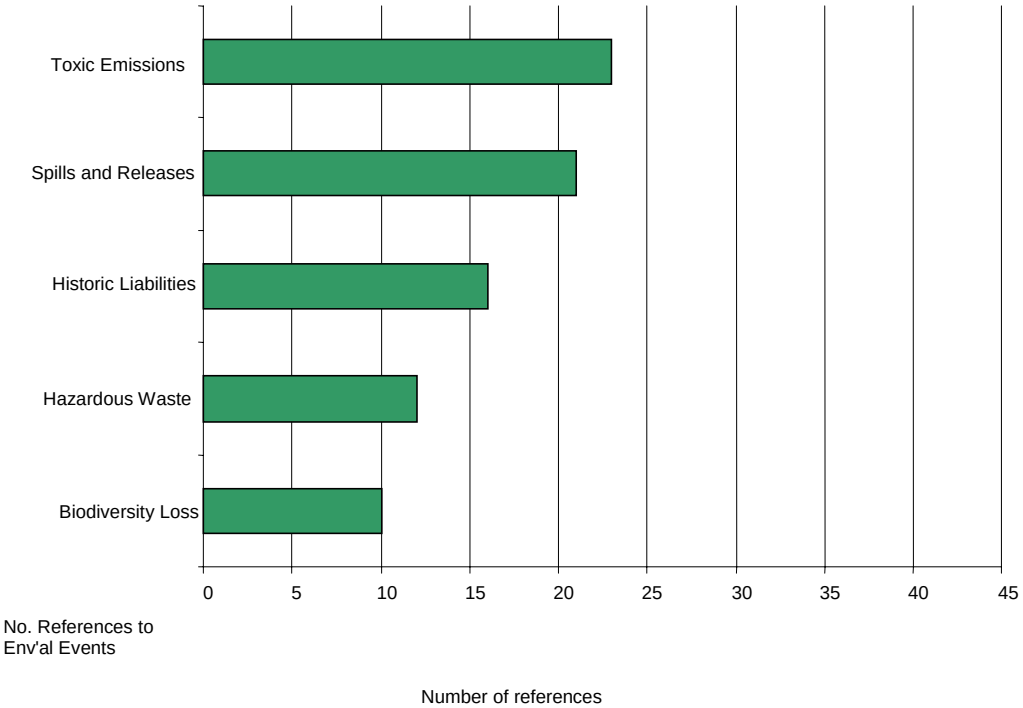


Table 9 shows that only 16 of the 60 studies had a focus on just one or two environmental and financial criteria. Studies examining 'green' fund performance may not be transparent about the environmental governance criteria used to construct the fund.

		Number of financial measures considered				
		1	2	3-5	6-9	10+
Number of studies using only 1 environmental governance measure	18	10	1	7	-	-
Number of studies using 2 environmental governance measures	11	3	2	3	2	1
Number of studies using 3-5 environmental governance measures	16	2	2	11	1	-
Number of studies using 6-9 environmental governance measures	10	1	1	3	4	1
Number of studies using 10+ environmental governance measures	5	1	1	1	1	1
Total	**60**	**17**	**7**	**25**	**8**	**3**

Table 9

Nb * 18 studies looked at just 1 environmental governance issue, such as use of an EMS. Of these 18 studies, 10 looked at the impact of that single environmental governance issue on just one indicator of financial performance, such as share price. Reading across the table, 7 of the 18 studies considered the impact of just 1 environmental governance issue on between 3-5 different financial indicators. Each row in the table can be read in this way.

Implementation of an environmental strategy is likely to enhance financial performance

It is becoming increasingly difficult for companies, particularly in the UK, to ignore calls for adoption of an appropriate environmental strategy, with many high profile fund managers having developed clear voting policies setting out the value they place on good environmental governance.

For example, Morley Fund Management's voting policy requires companies to disclose their approach to managing their environmental impacts. Morley considers that *'companies which do not have adequate safeguards in place will be susceptible to reputational risk and fines from regulatory authorities which may in turn lead to poorer financial returns'*.[18] Other institutional investors have developed similar voting policies.

One good example of the positive impact implementation of an environmental strategy can have comes from the company case studies. The case study which highlighted 3M's long-established environmental governance strategy revealed continuous and significant cost savings over a considerable period of time.

Environmental strategy studies showing positive correlations

In *'Do Global Environmental Standards Create or Destroy Market Value?'*, Dowell; Hart and Yeung, 2000, market valuations and environmental policies of S&P500 manufacturing and mining companies were examined. The authors noted that companies with the highest stated environmental standards also tended to have significantly higher price/book ratios. The study concluded that there is 'a significant and positive relationship between the market value of a company (as measured by Tobin's Q) and the level of environmental governance standards. Results also suggested that a firm's market value appreciates quickly once it adopts a higher environmental standard.' (This study won the 2001 Moskowitz Prize competition for the best quantitative study of socially responsible investing.)

'Corporate Social and Environmental Performance and their Relation to Financial Performance and Institutional Ownership: Empirical Evidence on Canadian Firms.', Mahoney and Roberts, 2002 evaluates the impact of environmental governance and social responsibility on the financial performance (ROE and ROA) of Toronto Stock Exchange firms. It found that both environmental performance and international social performance have a significant positive relationship with ROA and ROE. It also found that environmental performance was positively correlated with institutional ownership, but the overall social performance had a negative correlation.

18 http://www.morleyfm.co.uk/literature_library/corp_gov_voting.pdf

Climate change emerging as an important area of analysis and studies are unanimous in reporting that an appropriate climate change response pays off

Studies looking at climate change focus mainly on the potential financial impacts on various high impact industry sectors, such as utilities or the extractive industries. Implementation of a climate change strategy is generally found to have a positive impact on future financial performance. This is perhaps not surprising, given that climate change is a very high profile issue and certainly one which is very much on the radar screens of the financial community. The UK Government's Energy White Paper, published in February 2003, set out a new vision for the country's energy policy and puts the UK on the path to cutting its carbon dioxide emissions by 60% by 2050.

In November 2003 Environment Secretary Margaret Beckett told a City audience from the investment, financial and insurance sectors that companies and investors that are well informed about the risks of climate change will be best placed both to protect themselves, and to invest in cleaner technologies.

Climate change studies showing positive correlations

'Emissions Trading - Carbon Derby', Dresdner Kleinwort Wasserstein, 2003 looked at the impacts of emissions trading on 11 electric utility generators. The report examined value creation opportunities and assessed how those switching to cleaner fuels are set to benefit. The study found that the onset of emissions trading would affect the market cap of different electric utility companies. A main finding was that the biggest beneficiaries would be those operating in low priced electricity markets where the cost of emitting CO2 could be readily assimilated into prices.

In another recent utilities sector report, *'Environmental Exposures in the US Electric Utility Industry'*, Repetto and Henderson, 2003, there is a review of 47 US electric utilities' exposure to possible changes in future air emissions policies. The study estimated compliance costs of 5-115% of 2000 revenues, depending on the company and scenario under study.

In *'Changing Oil: Emerging Environmental Risks and Shareholder Value in the Oil and Gas Industry',* the World Resources Institute, 2002, the authors found that shareholder value could be impacted by 10% or more for some companies, although they noted that potential impact varies widely.

At the Institutional Investors' Group on Climate Change (IIGCC) conference the Secretary of State said that climate change is a crucial issue for UK investors and business and that it represents major opportunities to invest in new cleaner technologies, and to trade in greenhouse gas emissions.

She also noted that climate change also poses risks for those in business who do not address it properly, saying that *"Climate change could affect both the bottom line and business reputations. Investors need to know how the companies they invest in could be affected by changes in energy policy and regulation. On top of this, businesses could be exposed to the impacts of climate change. We could face a future of more floods, droughts and storms, leading to higher insurance costs and business disruption".* The company case study on Vestas which features in this report looks at a company which is tackling climate change concerns head on through a business strategy based on exploiting the market for renewable energy.

No weight of literature looking at how other individual measures of environmental governance may impact on financial performance

Other environmental governance factors, such as implementation of an EMS or risk management system, may also influence financial performance. Very few of the studies look at a single environmental governance issue (other than environmental strategy). Most studies look at a range of environmental governance issues, so it can be difficult to assess the extent to which any one particular environmental governance issue is responsible for a particular financial outcome.

The case studies selected in this report do attempt to focus on some of these individual environmental governance issues, such as environmental accounting practices at Baxter.

Environmental events which carry fines or incur liabilities clearly linked to the operating costs borne by companies

Several studies show that environmental events, such as pollution incidents, influence financial performance. It is in these studies that it does appear possible to link specific environmental performance measures, e.g. liabilities and fines, with well defined financial impacts. Nearly all the studies in this category concluded that a poor environmental performance record would be detrimental to the value of the firm, both in terms of operating costs and the value placed on the firm by the market.

The 'Sustainability Pays' literature review which features in this report's survey refers to the 'low-hanging fruit', meaning that in the early stages of pollution prevention quick and inexpensive changes can result in emissions reductions and corresponding cost reductions. Such savings are identified as being more difficult to achieve when companies get closer to eliminating pollution, since further reductions will imply rising capital and technology investment.

EMS studies showing positive correlations

'Financial Evidence of the Impact of Environmental Management Systems' is a report generated from an academic debate in 2003. This paper sought to find support for a framework to quantify EMS improvements and evidence of a financial incentive for implementation of EMS strategies. The financial indicators were not found to be significantly different for firms employing EMS and non-EMS companies. This finding was described as significant as it indicated that the cost of reducing a firm's environmental impact does not significantly impair profitability.

In *'Does Improving a Firm's Environmental Management System and Environmental Performance Result in a Higher Stock Price?'* Stanley; Soyka and Ameer, 1997, it is argued that superior environmental management should reduce financial risk and firm risk. The report estimated betas for 330 of the firms in the S&P500 stock index for 1980-1987 and 1988-1994. The study found that in a CAPM regression' where the assumption of uncorrelated residuals has been relaxed, the firm's proprietary environmental rating models have explanatory power.

Environmental risk studies showing positive correlations

'A Benchmarking Study: Environmental Credit Risk Factors in the Pan-European Banking Sector', ISIS, 2002 reviewed environmental risk controls of 10 European banks in which ISIS holds shares. The report found that 'the overwhelming consensus [of the banks] was that sound environmental credit risk assessment was a fundamental constituent of thorough overall credit risk assessment, and, all other things being equal, environmental risk factors played a potentially material role in financial outcomes', but little empirical evidence was provided for this assertion.

cost reductions. Such savings are identified as being more difficult to achieve when companies get closer to eliminating pollution, since further reductions will imply rising capital and technology investment.

Environmental event studies showing neutral or negative correlations

'The Cost of Environmental Protection' , 2001, Morgenstern; Pizer and Shih, contended that reported expenditures for environmental protection are often cited as an assessment of the burden of current regulatory efforts. However, it also contended that the potential for both incidental savings and uncounted costs means that the actual burden could be either higher or lower than these reported values. In one industry, the authors found statistically significant overstatement of costs. In three others, they found no significant deviation in either direction.

One study did sound a cautionary note about the findings of event studies. In *'Capital Markets and Corporate Environmental Performance: What Does the Empirical Work Tell Us?'*, Dinah A. Koehler, 2002, the author found several 'methodological issues serious enough to throw doubt' on event study findings of a strong relationship. The author further argued that 'these findings of a negative [short term] relationship should not matter much to long-term investors,' since studies implying long-term returns are driven not by environmental news, but by factors such as firm size, price/book and P/E ratio, as well as market risk and investor psychology.

Environmental event studies showing positive correlations

In *'Does the Market Value Environmental Performance?'*, an academic article by Cohen and Konar, 2001, the authors report on a study relating market value of firms in the S&P500 to objective measures of their environmental performance, and record on pollution in particular. The study concluded that legally emitted toxic chemicals have a significant effect on the intangible asset value of publicly traded companies. A 10% reduction in emissions of toxic chemicals resulted in a GBP£50 million increase in market value. The magnitude of these effects was found to vary across industries, with larger losses accruing to the traditionally polluting industries.

In another academic article, *'Exploring the Locus of Profitable Pollution Reduction'*, King and Lennox, 2002, the authors proposed that managers underestimate full value of some means of pollution reduction and so under-exploit these means. Based on evidence from previous studies, they argued that waste prevention often provides unexpected innovation offsets, but that on-site waste treatment often provides unexpected cost. They used statistical methods to test the direction and significance of the relationship between the various means of pollution reduction and profitability. They found strong evidence that waste prevention leads to financial gain, but no evidence that firms profit from reducing pollution by other means.

'Does it Really Pay to Be Green? Accounting for Strategy Selection in the Relationship Between Environmental and Financial Performance' also by King and Lennox, 2001, looked at a range of variables, including event analysis. Environmental performance was defined using two variables, one for industry emissions and one for the firm's emissions relative to its industry (data came from the EPA's Toxic Release Inventory). The study found that high emissions were associated with weak financial performance.

Case Studies

Objectives and structure

Although the literature review sourced 30 company studies, only one of these focused on the performance of a single company. To an extent, this result was anticipated and it is one of the reasons a decision was taken to undertake a separate assessment of the performance of individual companies, using a number of case studies. The case studies are presented in this section of the report. Several studies did provide anecdotal evidence on an aspect of financial performance that an individual company has been able to improve through implementation of an environmental governance measure. Most studies, though, looked at groups of companies in an index, sector or fund, and evaluated them on a comparative basis (according to their status as good or bad environmental performers and any financial impacts that corresponded to such status).

In light of this finding from the literature review, it was felt there was a need to try and progress the existing research by taking a systematic approach to the assessment of financial impacts at a number of individual firms. The companies chosen for the individual case studies were selected because, by and large, they have each implemented a different environmental governance measure. This helps to assess whether certain environmental governance measures may have related financial impacts. It also means that the case studies look beyond the impact of a broad environmental strategy, where hitherto the focus of the existing literature appears predominantly to have been.

Since the number of sector and fund surveys in the literature review was quite small, case study analyses of sector and fund performance were also undertaken. The table below lists the case studies included in this report (each case study is numbered for ease of reference):

Funds	Sectors	Companies
Jupiter Ecology Fund	Integrated oil & gas	3M
Winslow Green Growth Fund	EU and US electric utilities	Baxter International
	Paper and forest products	Co-operative Bank
	Water utilities	Iceland (The Big Food Group)
		Monsanto
		PSA Peugeot Citroen
		Shell
		Xstrata
		Vestas Wind Systems

Prior to publication of this report, all companies included in the company profiles section of this report were provided with an opportunity to comment on the analysis and conclusions drawn, as well as to provide any additional, relevant research. The Agency and study authors would like to thank all those companies that responded with comments and further data, which has helped to ensure case study accuracy.

1. Fund Case Study – Jupiter Ecology Fund

Growth of 194% since launch. Has out-performed benchmark index in last 5 years

Summary

The Fund

This fund was the first authorised green unit trust launched in the UK. It is a securities scheme and is an authorized unit trust scheme under section 243 of the Financial Services and Markets Act 2000. The fund is in the 'Global Growth' Investment Management Association category and is a qualifying fund for inclusion within the stocks and shares component of an Individual Savings Account (ISA). It is also a qualifying investment for inclusion in a Personal Equity Plan (PEP). The focus is on small-cap stocks.
Fund charges; Initial 5%; Annual 1.5%; Spread (Bid/Offer) 6%
Fund Facts: Fund Value £124 million; Number of holdings 90; Launch Date 1 April 1988

Background

The fund invests in companies worldwide, that are responding positively to and profiting from the challenge of environmental sustainability and that are also making a positive commitment to social well-being. The investment process is based on a combination of environmental and social assessments together with separate financial assessments. There is a strong focus on the environmental policy and management standards of the companies in which the fund invests.

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Companies only eligible for investment by the fund if they demonstrate high environmental policy and management standards, as well as a positive environmental performance record.	Fund return	Strong – environmental governance component of fund is a key investment criterion	Growth of 194% since launch on 1 April 1988. Fund ranked in top half in its sector for performance over last five years. Has clearly out-performed benchmark index in past 6 months and also did so for a three year period November 1999 – November 2002.

Environmental governance

Investment Objectives

- Fund objective and investment policy: to achieve long-term capital appreciation and a growing income while being consistent with a policy of protecting the environment. The investment policy is to invest in companies worldwide which demonstrate a positive commitment to the long-term protection of the environment.
- Investment criteria: the fund's environmental and social assessment is supported by in-house research conducted by the Jupiter Environmental Research Unit. Jupiter concentrates on those companies which are developing products and services to solve six specific environmental and social problems: air quality, water quality, waste management, transport, sustainable living and beneficiaries of legislation. The sixth theme looks specifically at those companies that are benefiting from increase environmental legislation.
- Industry and stocks avoided: avoids investment in companies involved in the provision of products and services in the following sectors: armaments, alcoholic drinks, tobacco, pornography, nuclear power, gambling and animal testing. In general the fund will not invest in a company which derives over 10% of its turnover from any one of these activities. Where a company has less than 10% of its turnover associated with these activities, an investment may be considered if it is believed that the company makes an outstanding contribution to sustainable development in other respects.

Research Process

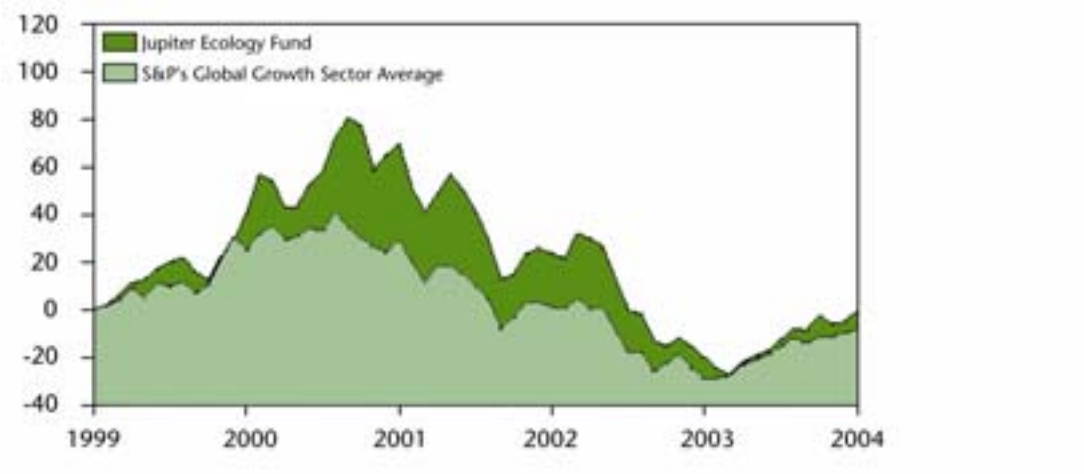
- Before a company is deemed eligible for investment, it is assessed through meetings with management representatives, on-site visits and questionnaires. Information is received from other interested stakeholders including campaign groups, financial analysts and trade bodies.
- Negative screening: companies are investigated to discover if they are involved in activities that conflict with the environmental, social and ethical objectives. If there is concern about companies' involvement in such activities, the fund will not invest in them.
- Positive screening: central to the fund research is positive screening. This involves researching companies to find out if they are actively improving their environmental or social performance. Companies that are making positive progress in these areas are added to the 'approved list', from which the funds draw their portfolios. Approval of a company is based either on the beneficial nature of its products or services or the high standard of its environmental and social management processes.
- Best in class: Jupiter compares companies against their competitors in the same stock market sector. This enables 'best in class' companies to be identified, in other words, the companies that are acting in a more responsible manner with regard to social and environmental issues than their peers. Best performing companies in each industry sector are added to the Approved List. More than one company in an industry sector may be identified as 'best in class'.
- Quality assurance: research is cross-checked internally by the Environmental Research Unit and is then reviewed by the Environmental Advisory Committee. Jupiter's Compliance Department also carries out regular checks to ensure that the fund holdings continue to comply with the SRI criteria and similar checks may be carried out by Jupiter's regulatory body, The Financial Services Authority.

Financial impacts

Performance

The fund's five year percentage growth as at 1 March 2004 stood at -2%. Its performance since launch on 1 April 1988 is, however, an impressive 194%. Over a three year period (1999 – 2002) the fund consistently out-performed its benchmark, assisted by its focus on smaller-cap, environmental technology stocks, as shown in figure 7 below.

Figure 7
Five Year Performance Chart for the Jupiter Ecology Fund up to 3 November 2003



Net Asset Values (1999 – 2003)

Appetite for the fund can be seen to be strong and increasing, looking at the change in number of units since 1999.

Date	value of fund	value per unit	units
31.03.99	£67,212,478	129.80p	51,782,013
31.03.00	£108,052,148	188.69p	57,263,828
31.03.01	£134,737,907	170.80p	78,888,328
31.03.02	£156,175,394	159.93p	97,654,828
31.03.03	£92,287,040	87.53p	105,429,828
30.09.03	£114,259,062	110.17p	103,711,328
31.03.04	£123,357,350	118.93p	103,721,327

2. Fund Case Study – Winslow Green Growth Fund

Consistently out-performed its benchmark, over a prolonged period - 18.40% average annual return since inception (to 2003) compared to 3.80% for the Russell 2000 Growth Index

Summary

The Fund

The Winslow Green Growth Fund is a diversified series of US Forum Funds (the Trust). The Trust is a Delaware business trust registered as an open-end management investment company under the Investment Company Act of 1940, as amended. The Trust currently has twenty series. The fund seeks capital appreciation through environmentally responsible investing and focuses on mid-cap stocks. The Fund started in 1994 as an investment trust and opened to the public in 2001.

Fund charges: Initial 0%; Annual 1.45%; Spread (Bid/Offer) 0% (At NAV)
Fund facts: Fund Value $32 million; Number of holdings 30-40; Launch date 3 May 1994

Background

The fund invests at least 80% of its net assets in equity securities of domestic companies that are either environmentally proactive or environmentally sensitive. Beginning with a universe of 600 small and mid-cap US stocks, the research team for the fund conducts the fundamental analysis stage of the investment process using information from a variety of sources. The research seeks to identify companies with superior products or services; ROE of at least 15% and growing; three year growth rate of at least 20%; a record of successful new product development; a strong or improving balance sheet; and strong management with a well defined strategy. Using internal and external research sources, including national and local environmental agencies, the research team develops and assigns environmental ratings to the companies analysed as part of this process, the results are reviewed annually with management.

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Some of the key assessment criteria include identifying products or services that solve environmental problems; good environmental citizenship; industries with no environmental impact; and leadership in cleaning up historically 'dirty' industries.	Fund return	Strong – environmental governance component of fund is a key investment criterion	Fund has tended to consistently out-perform its benchmark, over a prolonged period. For the one, three, five year and since inception periods, the average annual returns were 21.10%, -10.87%, 15.74% and 18.40%, respectively, versus 0.69%, -16.66%, -4.25% and 3.80% for the Russell 2000 Growth Index and 1.41%, -1.36%, 3.65% and 10.36% for the Russell 2500 Index.

Environmental governance

Investment Objectives

- Fund objectives and investment policy: to capture the power of 'green' investing using an aggressive growth approach. The fund seeks above-average long-term capital appreciation through environmentally effective investing.
- Investment criteria: using a disciplined screening process that incorporates both environmental and financial analysis, the fund examines a universe of mainly small- and mid-sized US stocks. Winslow creates a portfolio of 30 to 40 stocks that it believes are reasonably priced and show potential for superior growth.
- Winslow recognises that environmental effectiveness can be a leading indicator of management quality. The research process employs a proprietary analytical tool to classify investments in one of four categories: environmentally proactive; environmentally responsible; environmentally benign; best in class

Research Process

- The research process consists of three stages: stage 1 applies fundamental analysis to the universe of approximately 600 small and mid-cap stocks. Stage 2 undertakes the environmental analysis and stage 3 consists of the technical and valuation analysis, resulting in a final portfolio of 30 to 40 stocks.
- The environmental perspective groups green companies into the four basic categories described above. Winslow invests in firms from all four categories and this allows the fund to gain exposure to a wide range of industries and companies, while still focusing on those firms that show outstanding environmental leadership in each industry.
- Environmentally proactive (EP): to be assigned this rating, a company must have products or services that improve environmental conditions or solve environmental problems. EP companies typically embrace measures that exceed regulatory compliance (e.g. ISO certification), and openly disclose the environmental impacts of their operations (e.g. by publishing environmental reports). Industry examples include organic produce, alternative/renewable energy.
- Environmentally responsible (ER): companies in this category have no major environmental controversies pending. Operations comply with existing regulations and companies are working toward open disclosure on the environmental impact of their operations. Industry examples include product manufacturing/distribution, capital goods, technology, communications, healthcare, medical instruments.
- Environmentally benign (EB): this rating is given to companies that operate in an industry that has no substantial environmental challenges or impacts. They provide services, and have no manufacturing operations. Industry examples include financial services, Internet products/services.
- Best in class (BIC): this designation is for companies that have implemented environmental programs that set a standard for their industry sector. These companies are recognised leaders in their sector and contribute to a reduction in pollutant emissions or waste generated. BIC companies are those that exhibit the best environmental performance within their selected industry, and have gone well beyond their peers in reducing their environmental impact. Industry examples include semiconductors, mining.
- Technical and valuation analysis: the final stage of constructing the 30-40 stock portfolio compares companies to their peers using technical data, reviews and analyses trading patterns and liquidity to evaluate entry and exit points. The portfolio looks for attractively priced stocks, PEG ratios lower than that of peer group and finally a reason to confirm the expectation for the stock price to rise.

Financial impacts

Performance and Net Asset Values

The fund ended the quarter with a net asset value per share of $11.48, up 43.86% for the three months ended June 30, 2003, and up 52.86% for the six months ended June 30, 2003. The Russell 2000 Growth Index, the fund's primary index, was up 24.15% in the same three month period ended June 30, 2003, while the Russell 2500 Index, the fund's historical index, was up 21.91%.

	1 yr	3 yr	5 yr	Since inception
Winslow GGF	21.10%	-10.87%	15.74%	18.40%
Russell 2000	0.69%	-16.66%	-4.25%	3.80%
Russell 2500	1.41%	-1.36%	3.65%	10.36%

Table 11

As described in the table above, for the one, three, five year and since inception periods, the fund's average annual returns were 21.10%, -10.87%, 15.74% and 18.40%, respectively, such that it outperformed the Russell 2000 Growth Index and the Russell 2500 Index.

In February 2004 the Fund reported that in the previous twelve months its shares had gained 102%, the top performance in the Bloomberg Responsible Fund Index and 39 percentage points better than the Russell 2000 growth index.

3. Sector Case Study – Integrated Oil & Gas

Over 3 years and 1 year, respectively, share price of top environmental rated firms outperformed laggards by 11.8% and 2.6%

Summary

The Sector

The oil & gas sector plays a major geopolitical role at the international level in companies such as ExxonMobil, Shell, Lukoil, BP, Chevron Texaco, TotalFinaElf. Market deregulation, along with oil price volatility, has led to consolidation both horizontally and vertically in the traditional contracting supply chain. This sector integrates upstream and downstream oil & gas companies, from exploration and extraction to refineries. Since 1999 the industry has experienced a stable recovery in activity and continued world economic growth will lead to increased demand for energy. The growing issue of climate change is expected to have an impact on the bottom line and has already implied a strategic shift towards cleaner energy and to greater use of gas.

Background

In the integrated oil and gas (exploration and production) sector, the correlation between eco-efficiency and stock price performance is pronounced. As the financial penalties resulting from environmental transgressions grow larger and larger, companies are focusing first and foremost on achieving environmental regulatory compliance. For many, meeting environmental regulatory standards is only the starting point. Leading firms see the environment as a competitive phenomenon that can confer considerable business advantage. Big-picture issues such as global climate change, energy convergence and sustainable development strike to the very heart of the energy industry's future and companies will ignore these forces at their peril.

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Overall environmental profile is appropriate as an indicator of management quality and overall propensity to outperform competitors	Share price performance, top vs bottom rated companies	Strong - findings suggest that although individual issues difficult to assess quantitatively, correlation-based results provide evidence that environmental leadership valued by the market	Over 3 years and 1 year, top firms outperformed laggards by 11.8% and 2.6%, respectively[19]
Within the sector, wide variations exist in risk exposure, risk management capability and engagement in environmentally-driven business opportunities	Other financial performance measures, top vs bottom rated companies	Strong – environmental governance strategies appear to have strong implications for certain key financial measures, though not all	Operating Profit Per Share: by 44% ($8.85 versus $6.13); Price to Book Ratio (5 yr average): by 33% (2.65 versus 2.00); Price to Cash Flow (5 yr average): by 49% (8.64 versus 5.81); P/E Ratio (average highs over 5 yrs): by 50% (21.8 versus 14.5)

[19] Please refer to Appendix for details of the Innovest methodology used to assess company performance in the sector case studies

Environmental governance

Issues

- Adverse NGO, media and consumer reactions to the oil industry in general, following incidents such as Exxon Valdez and Brent Spar
- Growing international concerns about climate change and concerted action by governments and international institutions such as the UN, witness the recent Institutional Investors' Summit on Climate Risk at the UN headquarters
- Energy security and infrastructure safety (e.g. pipeline breaches) which cut across several areas including pollution, employee health and safety, acceptance among local communities and relationships with regulators/policy makers.
- Natural gas and energy convergence
- Site remediation liabilities due to the resource intensive nature of the petroleum industry
- Tightening chemical regulations for petroleum companies involved in chemical production

Responses

- A large gradual transition from oil to gas in advanced industrial economies and from coal to gas in several economies-in-transition, in large part because of the environmental and efficiency advantages this transition confers
- Remediation reserves for some companies have been established, some greater than US$750 million
- Diversification into low-carbon technologies: although each of the major integrated firms is involved in ‘renewables’, there are wide differences in approach.
- Shifting of assets to gain greater natural gas exposure in recent years, especially as producers and suppliers to continental Europe and the UK, which are more concerned about carbon efficiency.
- Corporate involvement with sustainability reporting and stakeholder dialogue has risen a great deal in recent years

Financial impacts

Fundamentals

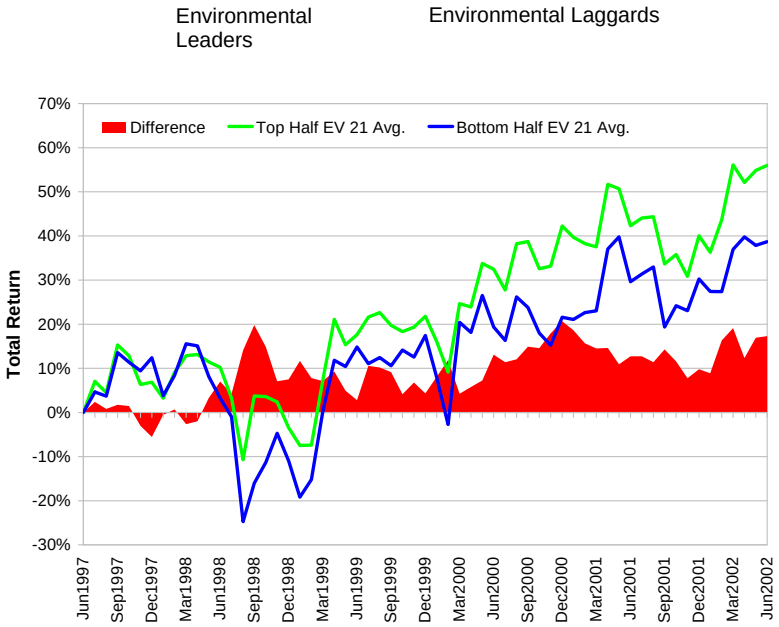
Share price performance

As shown in the figure below, companies with above average environmental governance standards and above average environmental track record outperformed companies with below average standards and performance by approximately 17.3% (1730 basis points) over 5 years from June 1997 to June 2002. Over 3 years and 1 year, respectively, top firms outperformed laggards by 11.8% and 2.6%, respectively.

Figure 11

Percentage Change in Total Return of Environmental Leaders v Laggards in the Integrated Oil & Gas Sector 1997 – 2002

NB Figures and results based on Innovest proprietary ratings of above and below average performers



Integrated Oil & Gas Company Rankings

Company	Ranking
Amerada Hess	Top Tier
BP	Top Tier
RD/Shell	Top Tier
Norsk Hyrdo	Top Tier
Suncor	Top Tier
ExxonMobil	Top Tier
Chevron Texaco	Middle Tier
ENI	Middle Tier
PetroCanada	Middle Tier
Phillips Petroleum	Middle Tier
TotalFinaElf	Middle Tier
Repsol-YPF	Middle Tier
Imperial Oil	Bottom Tier
Lukoil	Bottom Tier
Occidental Petroleum	Bottom Tier
Marathon	Bottom Tier
Conoco	Bottom Tier

Table 12
Based on Innovest proprietary ratings

Other financial metrics

Top performing stocks, in terms of overall environmental governance and environmental track record, also posted superior results over low scoring companies in various business performance and market valuation ratios:

- Operating Profit Per Share; by 44% ($8.85 versus $6.13)
- Price to Book Ratio (5 yr average); by 33% (2.65 versus 2.00)
- Price to Cash Flow (5 yr average); by 49% (8.64 versus 5.81)
- P/E Ratio (average highs over 5 yrs); by 50% (21.8 versus 14.5)

But not with any discernable pattern in terms of:

- Return on Assets (5 yr average)
- Return on Equity Per Share; top firms underperformed laggards by 26%
- Return on Equity (average over 3 yrs); by 34%

Intangibles

Corporate reputation

Firms realise that their franchise value, license to operate, brand, reputation is a critical component of the overall value and a key determinant of shareholder return. And few issues can damage that value faster than being involved in a major oil spill or becoming embroiled in a controversial drilling project. For multinational corporations, particularly those in the resource sectors, operations around sensitive or controversial sites can be a key determinant of reputation and, by extension, the creation and erosion of intangible value. Many companies within the oil and gas sector have experienced significant negative public relations and financial pressure from shareholders over sensitive site issues. With companies pushing more and more to explore in remote and ecologically sensitive places, the risk of brand-damaging incidents occurring is heightening rapidly.

Competitive advantage

Despite short-term fluctuations in price, natural gas will be the fuel of choice in advanced industrial economies in large part because of the environmental and efficiency advantages it confers. A gradual transition has also begun to take place from coal to gas in several large economies-in-transition in part because of environmental concerns, and it seems unlikely that this trend will be reversed. Technological advancements are also making it increasingly more economical to transport natural gas rather than flare it off. Companies with strong strategic interests in natural gas, with the capability to commercialize gas assets using gas to liquids technology, and with an involvement in liquefied natural gas production are likely to gain competitive advantage.

In the downstream business, where product differentiation can be tough, and where the ability to take advantage of price premiums at the pump is unrealistic, brand equity shows through in the preference or attitude of customers, which affects their loyalty and in turn the company's market share.

New markets

The involvement of oil and gas companies in renewable energy technologies continues to be a high-profile aspect of corporate strategy and one that creates marked distinctions between the firms covered in this study. In distinguishing between companies on the renewables and energy technology issue, resources devoted towards technology development were examined as well as the strength of partnerships, type of technology and state of commercialization, product or prototype demonstrations and, where possible, product orders.

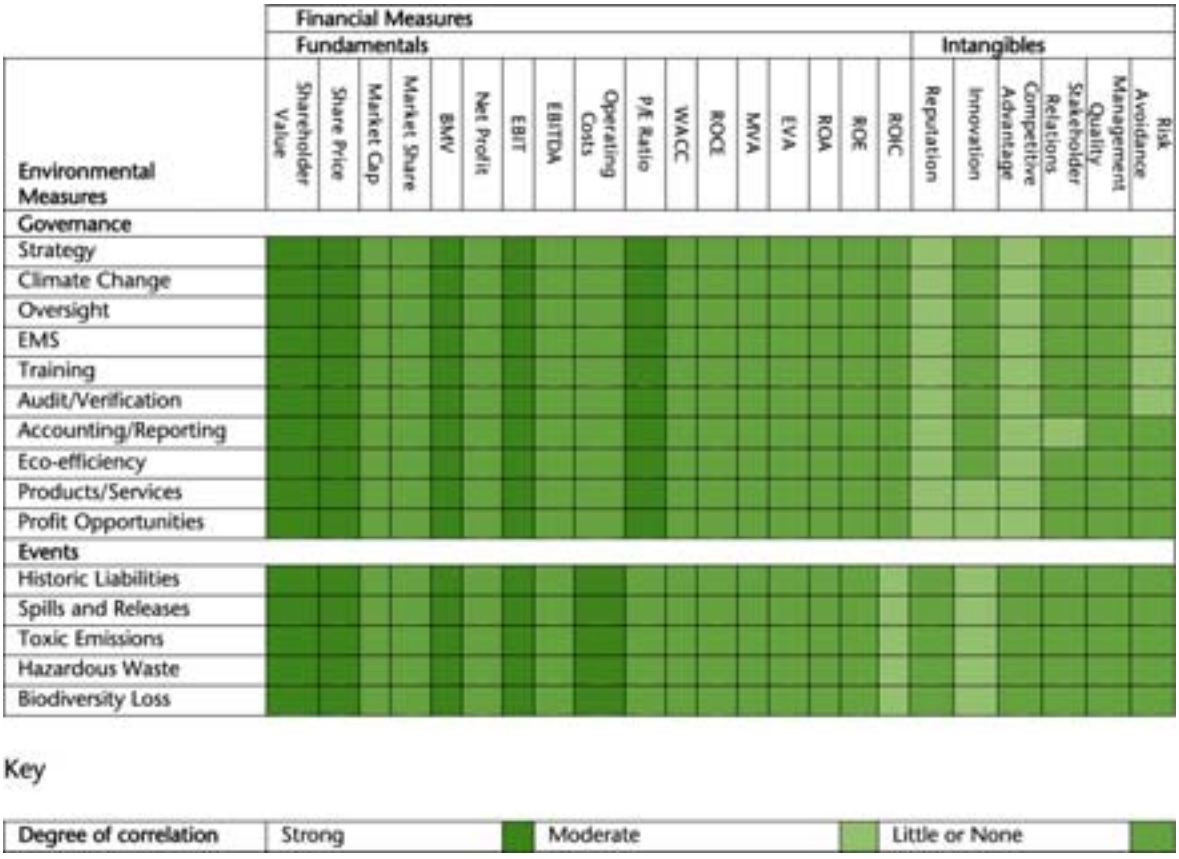
Similar to renewables, the development of fuel cells is a long term issue which can also add value in the short run. All of the companies with downstream exposure have been engaged in clean fuel development to one extent or another, primarily due to regulatory pressures. Some firms are going beyond what is required by law to take a technology leadership position in fuel cell and engine technology, and position themselves for what has been termed the Hydrogen Future.

Gaining access to new geographical areas of exploitation is one issue where good reputation, in-depth stakeholder relationship (local communities and public entities) and real environmental concerns can translate directly into fresh revenue. Continued access to new leases is also becoming more closely linked to a company's skill in overcoming environmental regulatory hurdles, as developments in the UK indicate. Speaking recently, UK Energy Minister Peter Hain said in connection with the tough new environmental controls on oil and gas drilling around Britain's coasts that firms would be awarded licenses to explore the sea bed only if they can prove they will minimize the effect on natural habitats.

Operational efficiency

A company's performance in managing its emissions, complying with local regulations and avoiding major incidents such as spills and refinery accidents can be a useful barometer of management quality and commitment to operating excellence. Consistently good performance not only indicates that a company is well run, but that it can also eliminate unnecessary operating expenditures and so enhance profitability. The firms surveyed here were examined on the basis of normalized performance in air emissions, spills and regulatory compliance, and waste generation (hazardous and non-hazardous). The energy-intensive nature of oil and gas operations places a premium on the ability to conserve resources and pursue a more integrated energy management strategy. Companies can generate substantial reductions in operating costs through better conservation of resources, although the extent to which firms quantify the financial benefits is still limited. Although access to data is patchy, this study benchmarked the oil and gas firms according to efficiency in water usage, waste generation, flaring emissions and energy intensity.

Appendix – summary of financial impacts identified



Key

Degree of correlation	Strong	Moderate	Little or None

4. Sector Case Study – EU and US Electric Utilities

Stock price of EU electric utilities with above average environmental performance exceeded that of below average performers by 39% over 3 yrs

Summary

The Sector

Reviewed here are 27 US and 15 EU companies. The industry comprises both regulated vertically-integrated utilities, deregulated 'merchant generators', supply companies and transmission and distribution companies. Due to market liberalisation moving ahead apace in the EU and to a lesser extent in the US, companies are jockeying for competitive position by undertaking mergers and acquisitions, diversifying and cost-cutting as far as possible. At the same time, environmental regulations are being tightened, energy security is being questioned and an increasing number of climate-change related initiatives are being implemented globally, all requiring significant investments for many companies

Background

As restrictions on air emissions tighten and financial penalties increase companies are focusing on achieving regulatory compliance and also looking towards various emissions trading schemes as useful market mechanisms to realise emissions reductions at lowest cost across the industry. The most forward-looking directors are entering into renewable energy development, green-power marketing and energy-related services such as energy efficiency advice and demand side management to both mitigate risk and investigate new sources of revenue.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Lack of environmental strategy during the early 1990s to address pollutants responsible for 'acid rain'	Loss of good reputation; regulatory response costs	Moderate	Costs of pollution control technology run to millions of pounds
The lack of environmental and particularly climate-related strategies among some companies has led to higher likelihood of stranded assets in the EU due to the forthcoming EU emissions trading scheme.	Costs of retrofitting pollution control technology	Moderate - Large investment needed in pollution control on coal plants	As above, costs of pollution control technology run to millions of pounds
Forward-looking companies entered into renewable energy development, green-power marketing and energy-related services and demand side management to both mitigate risk and investigate new sources of revenue	Improved reputation, hedged risk, competitive advantage, increased sources of revenue. Share price out-performance	Strong – inclusion in leading ethical indexes, increased market share	The stock price of EU electric utilities with above average environmental performance exceeded that of others by 39% over 3 yrs. A similar but less extreme effect can be seen in the US stocks
Operational efficiency more and more important in newly deregulated electricity markets, including those costs related to the environment, e.g., waste-disposal costs and fines for air emissions	Operating costs and earnings per share	Moderate – no longer able to pass costs to consumers, have to cut power prices	Higher operating costs reduce profitability and competitiveness

Environmental governance

Issues

- Significant growth in societal concerns about air emissions from power plants such as SO2, NOx, particulates and mercury and the links to increased relative mortality risks as well as the damage to forest soils and freshwater and coastal ecosystems through acidification.
- Increasing evidence of global climate change and its various negative impacts has precipitated concerted action to tackle the issue on the part of governments and international institutions; as major CO2 emitters and large stationary sources, electric utilities are now under a significant amount of pressure to curb emissions.
- Governments, NGOs, the public and markets are all pushing electric utilities to provide more environmentally-responsible products and services, e.g., electricity produced by renewable sources as well as energy management services to increase energy efficiency, partly to combat climate change, partly to prevent harmful air emissions and partly as a response to energy security concerns.
- Market deregulation and restructuring intended to boost competitiveness and thereby reduce costs for consumers has given rise to escalating competitiveness, a lack of transparency in corporate governance as illustrated by the Enron scandal and the Californian energy crisis and significant reductions in maintenance work and investment in pollution-prevention technologies.
- The highly publicised accidents at Three Mile Island and Chernobyl heightened safety concerns during the 1980s and the ongoing global debates over the reprocessing and long-term storage and containment of high-level radioactive waste has done nothing to raise public confidence in the nuclear industry. Italy shut down its nuclear reactors a year after the Chernobyl disaster and Germany is planning to phase out nuclear power in the generation mix over the next two decades.
- A significant amount of contamination of subsurface soil and groundwater has been caused by leachate from coal piles and ash landfills, fuel oil leaks and spills at power plants and emissions from waste-water treatment facilities, cooling water systems and holding ponds as well as PCB contaminates from transformers. In the US, land remediation costs can range into millions of dollars per site, e.g., the Superfund sites. Even hydroelectric power can threaten particular ecosystems as dams alter the hydrology and sediment-loads of rivers.
- Lack of energy security and infrastructure investment have become major issues, particularly in the US following a massive power-cut in August 2003, affecting 50 million people in seven states and Canada. Several countries in the EU have also experienced extensive power-cuts. The North American Electric Reliability Council (NERC) reported that power deals that could not be fulfilled due to transmission constraints increased five-fold to nearly 1,500 instances in 2002 compared to 300 in 1998 and transmission investment has fallen from about US$5bn in 1975 to US$2bn in 2000 (in 1997 dollars) according to the EEI.

Responses

- At the plants of the leading environmental performers, air emissions reductions have gone beyond increasing regulatory requirements in the EU and US (upcoming legislation - Large Combustion Plants Directive and the Clear Skies Initiative).
- Most electric utilities now agree on the need to address potential consequences of climate change. Several leading companies in the US electric utility sector are proactively pursuing voluntary CO2 emissions reductions programs and nearly all endorse emissions trading schemes and credit for early action to reduce emissions. In the EU, the development of market mechanisms to combat climate change is well advanced, e.g., the European Emissions Trading System (ETS) scheduled to start in 2005, and corporate strategies to deal with this are beginning to emerge.
- Growing pressures from regulators, consumers and shareholders for more environmentally-favourable products, services and corporate policies have made several dormant business opportunities more attractive, including energy management services, green power marketing in liberalised markets and renewable energy distributed generation development.
- The transition to open markets has demanded that companies strengthen their ability to attract and retain customers who can now choose between various suppliers, restructure their organisation, explore diverse markets for expansion, and probably most importantly, to internalise certain costs for the first time. Leaders demonstrate strong senior management

commitment to environmental excellence, integrate environmental issues into their overall business strategies and pro-actively reduce emissions and wastes to cut costs. Renewable energy and distributed generation technologies as described above have the potential to gain significant market share in a deregulated energy services market.

- The nuclear industry is putting pressure on governments and relevant agencies in the US and EU to fulfil their commitments and provide long-term repositories for high-level nuclear waste to allay public concerns and perhaps allow the industry to commence construction of new plant. The industry is also often quick to play its card of zero-emissions energy and the undisputed benefits of that given the climate change debate.
- For a consistently reliable supply of electricity in the US particularly, some utilities will have to make significant investments to upgrade the system.
- Almost all the large companies in this sector have implemented environmental management systems and business strategies that oversee the issues discussed above. Leading beyond-compliance programs typically include the use of scenario analysis to assess current and future market and regulatory forces impacting the company, implementation of annual quantitative targets, tracking of a wide range of environmental performance metrics and environmental accounting.

Financial impacts

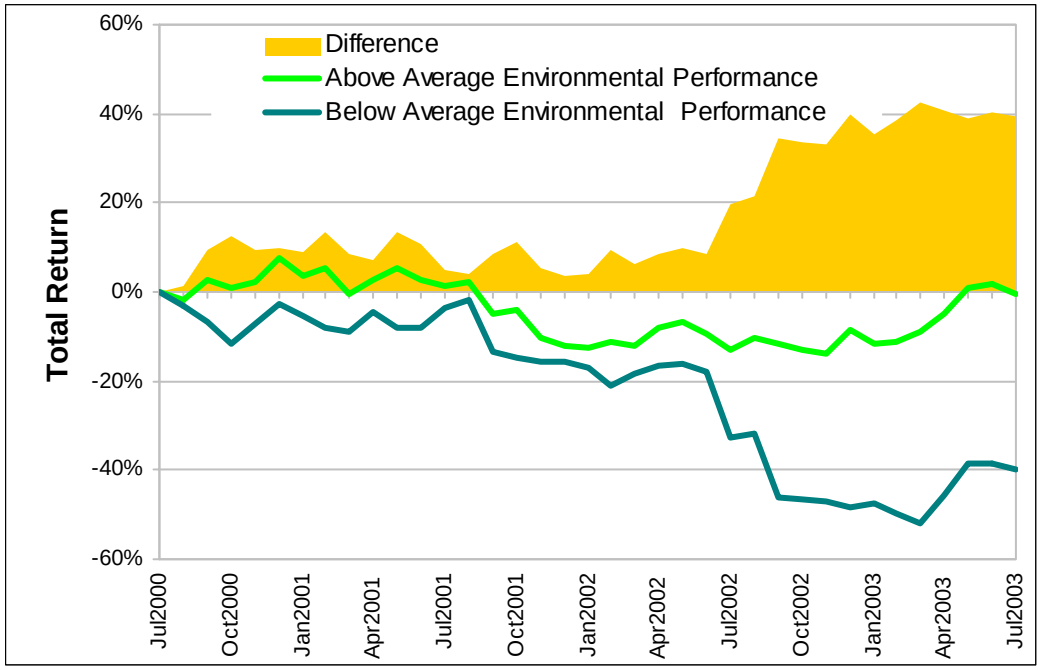
Fundamentals

Share price performance

The stock prices of EU electric utilities with above average environmental governance standards outperformed those of below average companies by 39.3% (3930 basis points) over 3 years from July 2000 to July 2003. Over 2 years and 1 year, respectively, top firms outperformed laggards by 35.8% and 24.8%, respectively.

Figure 12

Percentage Change in Total Return of Environmental Leaders v Laggards in the EU Electric Utilities Sector 2000 – 2003



NB Figures and results based on Innovest proprietary ratings of above and below average performers

EU electric utility company ratings

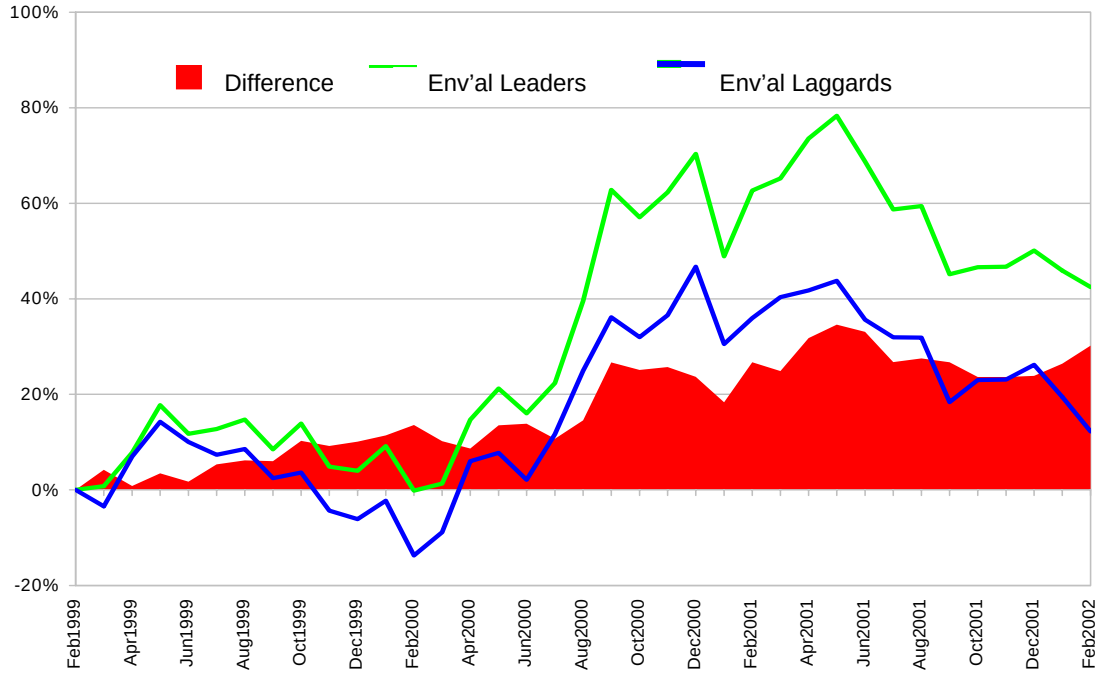
Company	Ranking
Electricidade de Portugal, SA	Top Tier
Iberdrola SA	Top Tier
National Grid Transco plc	Top Tier
Scottish and Southern Energy plc	Top Tier
Scottish Power plc	Top Tier
TransAlta Corporation	Top Tier
Viridian Group plc	Top Tier
Endesa SA	Middle Tier
International Power plc	Middle Tier
Union Electrica Fenosa	Middle Tier
British Energy plc	Bottom Tier
E.ON AG	Bottom Tier
Electrabel SA	Bottom Tier
Enel spa	Bottom Tier
RWE AG	Bottom Tier

Table 13
Based on Innovest proprietary ratings

The stock price performance of the top and bottom environmental performers in the US electricity sector demonstrates the same pattern.

Figure 13

Percentage Change in Total Return of Environmental Leaders v Laggards in the US Electric Utilities Sector 2000 - 2003



NB Figures and results based on Innovest proprietary ratings of above and below average performers

US electric utility company rankings

Company	Rating
Calpine Corp.	Top Tier
Consolidated Edison Inc	Top Tier
DTE Energy Company	Top Tier
Duke Energy Corp.	Top Tier
FPL Group	Top Tier
Pinnacle West Capital Corp.	Top Tier
PPL Corp.	Top Tier
Public Service Enterprise Group	Top Tier
TXU US Holdings Company	Top Tier
AES Corp.	Middle Tier
Centerpoint Energy Inc	Middle Tier
Constellation Energy	Middle Tier
Edison International Inc	Middle Tier
Entergy Corp.	Middle Tier
Exelon	Middle Tier
Southern Company	Middle Tier
Xcel Energy Inc	Middle Tier
Allegheny Energy Inc	Bottom Tier
Ameren	Bottom Tier
American Electric Power Co. Inc	Bottom Tier
Cinergy Corp.	Bottom Tier
CMS Energy Corp.	Bottom Tier
Dominion Resources	Bottom Tier
Firstenergy Corp.	Bottom Tier
Progress Energy Inc	Bottom Tier
Teco Energy Inc	Bottom Tier

Table 14

Based on Innovest proprietary ratings

Other financial metrics

In the EU, the top performing stocks, in terms of overall environmental governance and environmental track record, also posted superior results over low scoring companies in various business performance and market valuation ratios:

- Operating Margin, 15.8% vs. 7.8%
- Return on Equity, 16.9% vs. 11.2%
- Return on Assets, 3.6% vs. (20.5%)
- Price/Earnings Ratio, 21.2 vs. 8.9
- Price/Book Ratio, 2.0 vs. 1.7

Intangibles

Corporate reputation

Many firms now consider that their reputation is a critical component of their overall value and a key determinant of shareholder return. To be the cause of major price-hikes due to unreliable supply or dubious energy trading, power-outages, either serious individual air pollution incidents or ongoing chronic pollution, or to be involved in controversial nuclear waste management issues have all been shown to be damaging to a utility or generator's reputation.

To minimize their risks, companies have become more sensitive to site issues, developed their stakeholder engagement and communications programs and improved their overall environmental performance, particularly engaging with governments and industry groups to hammer out acceptable compromises over market mechanisms used to combat climate change. There is growing awareness among shareholders of the impact of environmental performance and related corporate governance issues on financial value. While environmental disclosure requirements have existed since 1970, widespread allegations of accounting irregularities and fraud together have placed unprecedented pressure on regulatory bodies to more strongly enforce them and avoid underreporting practices through accounting loopholes. Shareholders are becoming more activist, too. In April 2003, shareholders representing 27% of AEP's shares supported a resolution requiring the company to assess climate change related risks and opportunities as well as to disclose its mitigation strategy. During 2003, 23% of Southern Company's shareholders voted on a resolution that would require the company to analyze the financial risks of how it deals with climate change issues.

Competitive advantage

Companies with a low emissions asset base of efficient combined cycle gas turbines and renewable energy sources are likely to gain competitive advantage and avoid stranded assets due to the expense of upgrading old plant to meet new regulatory requirements currently being implemented in the EU and planned in the US. To reduce greenhouse gas emissions in line with the EU emissions trading scheme, for example, companies can either purchase emission credits or reduce their needs for additional emission credits and save money by introducing internal reduction measures e.g. efficiency improvements or fuel-switching, as well as using the project-based mechanisms such as energy conservation or reforestation projects.

The most proactive US companies continue moving beyond regulation by setting CO2 emissions reductions targets and monitoring progress, monetizing external impact of fossil fuel generation and working with regulatory and industry bodies to develop beneficial legislation. Related greenhouse gas reduction programs include fossil efficiency improvements, fuel switching to natural gas or renewable energy, energy conservation, renewable energy development, nuclear generation, and reclamation of SF6 gases.

New markets

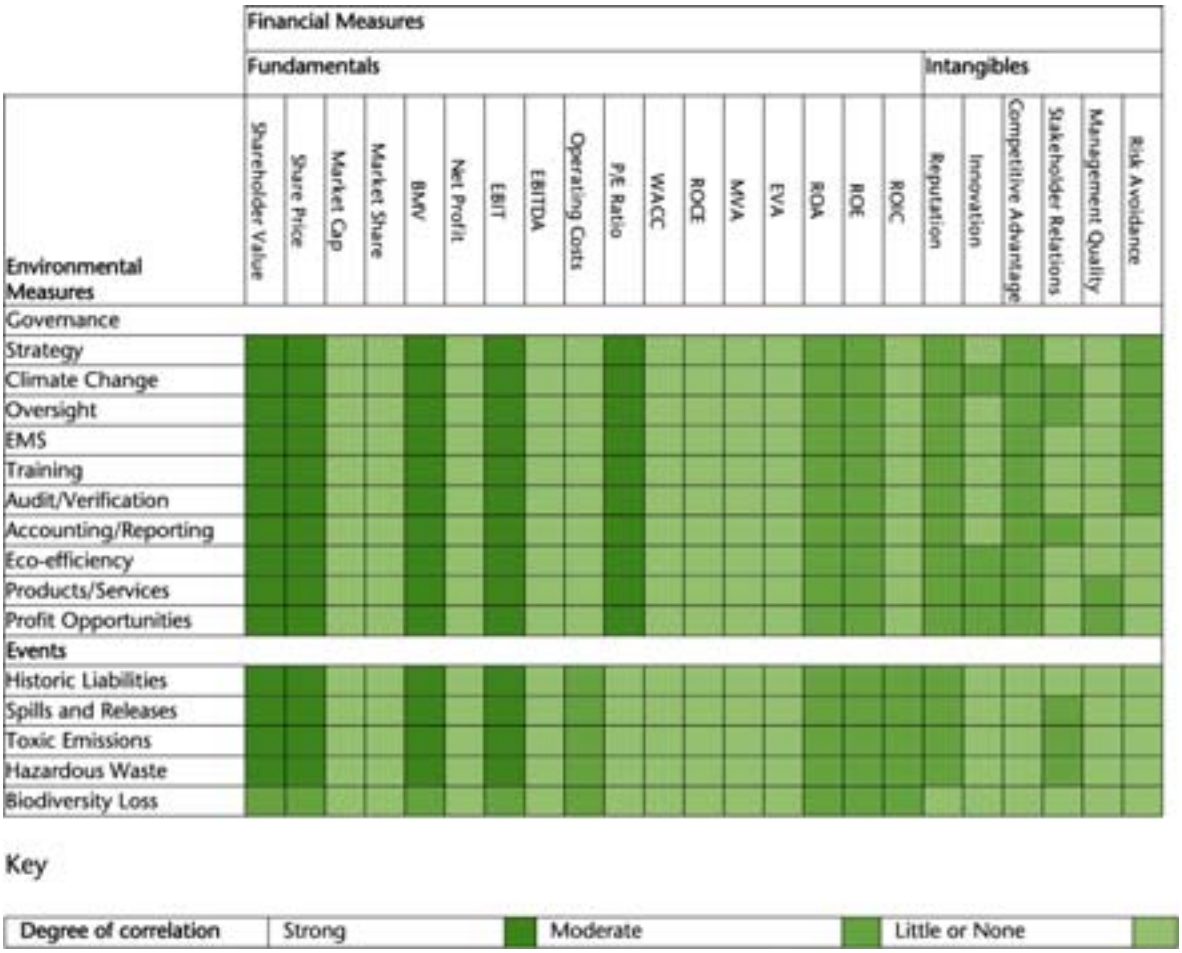
The involvement of electric utility companies in renewable energy technologies, distributed generation and energy management services continues to be a significant and growing aspect of corporate strategy given the increasing importance of climate change on the international agenda

and one that creates marked distinctions between the firms covered in this study. Similarly to 'renewables', the development of fuel cells and micro combined heat and power units may also add value in the medium-term, by allowing electric utilities to provide some services in distributed generation and offsetting the loss in sales through central generation and transmission.

Operational efficiency

A company's performance in managing its emissions and wastes, complying with local environmental regulations and supporting international initiatives such as those surrounding climate change can be a useful barometer of management quality and commitment to operating excellence. The resource-intensive nature of electricity-generation as well as the risks attached to the resulting emissions places a premium on the ability to conserve resources and promote energy management strategies to consumers. Companies can generate substantial reductions in operating costs although the extent to which firms quantify the financial benefits is still limited.

Appendix – summary of financial impacts identified



Key

Degree of correlation	Strong	Moderate	Little or None

5. Sector Case Study – Forest & Paper Products

Companies with above average environmental governance standards and environmental track record outperformed companies with below average ratings by over 43% in four years

Summary

The Sector

The paper & forest products industry ranks as one of the world's most important sectors both from an economic and an ecological perspective. It represents close to 3% of the world's gross economic output. The forests upon which it depends are among the most critical ecosystems for the health of the planet and for human well being. The size of the industry, its links to the rest of the world economy, and the importance of its resource base make it a target of intense public scrutiny and government regulation. Since 1980, world paper production has increased by 72% to almost 310 million tons and is forecasted to grow to 400 million tons by 2010. Global paper production is currently dominated by North America (33%), Asia (30%) and Western Europe (27%). Total world exports of pulp and paper products amounted to 131 million tons in 2001 (almost 27% of world's total production).

Background

Paper & forest products companies have implemented a variety of approaches to reduce their environmental risk exposures and improve risk management capacity. Leading firms are capitalizing on environmentally- driven business opportunities created by improved corporate environmental performance. A company's capacity to manage environmental issues has strong implications for stock price performance, but management capacity is not always captured by conventional analytical methods. In the paper & forests products sector, the correlation between eco-efficiency and stock price performance is pronounced. These correlation-based results provide strong evidence of the financial merits of environmental leadership to the value placed by the market on the shares of top performing firms.

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Overall environmental profile is appropriate as an indicator of management quality and overall propensity to outperform competitors	Share price performance, top vs. bottom rated companies	Strong - findings suggest that although individual issues difficult to assess quantitatively, correlation-based results provide evidence that environmental leadership is valued by the market	Companies with above average environmental governance standards and above average environmental track record financially outperformed companies with below average ratings by more than 43% over the four years from March 1999 to March 2003.
Within the sector, wide variations exist in risk exposure, risk management capability and engagement in environmentally-driven business opportunities	Other financial performance measures, top vs. bottom rated companies	Strong – environmental governance strategies appear to have strong implications for certain key financial measures, though not all.	Operating Profit Margin, 14.8% versus 5.0%; Net Profit Margin, 3.7% versus 1.2%; Return on Equity, 3.2% versus 1.1%; Return on Assets, 1.6% versus 0.8%; Price/Earnings Ratio, 24.4 versus (19.8); Total Return – 5 Years, 21.5% versus 0.4%

Environmental governance

Issues

- Worldwide regulations to protect forest resources – For example, in 1997 Brazil introduced a moratorium on mahogany logging and California and Oregon have introduced restrictive measures to protect ecosystems. International efforts towards forest preservation come from the World Bank, United Nations and International Monetary Fund. Climate change concerns have

also created increased demands for forest preservation – the World Resources Institute has implemented a satellite logging system to check logging operations worldwide.

- Increased pressure from NGOs and consumers demanding that companies have stronger environmental commitments and implement corporate social responsibility have, for some time, been important considerations for paper & forest products companies competing in the global market.
- Environmental groups have been expanding their coverage, consistently raising the environmental expectations of consumers in emerging markets.
- Increasing consumer demand for certified forest products (CFPs) labels demonstrating that products come from forests that meet, in a verifiable manner, standards for SFM.
- As awareness heightens over the protection of natural resources, public procurement and business-to-business markets are setting up market standards that make it appealing for companies to compete with eco-labels. There is a strong demand for CFPs in several European countries, and many governments have taken action to implement 'green' public procurement policies that favor CFPs.
- The emergence of buyers groups to pressure forest products companies to significantly expand the supply of (Forestry Stewardship Council) FSC-certified products.
- The sector has faced mounting environmental constraints and increasingly stringent regulations due to the rising standards by governments and the public aiming to minimize chemical discharges to air and water. New regulations worldwide have required sector companies to make substantial investments to minimize negative impacts.
- The management of hazardous releases represents the largest environmental liability in the sector in economic terms, as demonstrated by fines, litigations, disposal costs and potential product phase-out.
- The substitution of recycled fiber for virgin fiber has been increasing all over the world for both environmental and financial reasons. Legislation in several nations requires that some paper products contain a specified minimum recycled content. Solid waste concerns have also forced governments to adopt laws that promote recycling and programs that lower the amount of materials used in packaging.

Responses

- In order to counteract negative effects on reputation and profitability, leading companies have backed up sound environmental management policies with third-party verified environmental management systems (EMS). They also have improved oversight of operations and their effects on the environment through re-structuring corporate governance.
- To address environmental challenges and improve their reputations, efficient strategies to cope with environmental issues are becoming crucial elements of corporate business development plans. Leaders in the sector have beyond-compliance strategies, have demonstrated innovative approaches in dealing with environment-related risks especially chemical discharges to air and water, and have implemented strategies to improve their resource and energy efficiency.
- Companies have engaged in certification practices in response to pressure from governments, buyers groups and consumers who require certified products. North European companies have been endorsing the FSC scheme, reputed to be the most comprehensive set of guidelines. Other certification schemes include the Pan-European Forest Certification system, the Sustainable Forestry Initiative (US) and the Canadian Standard Association system.
- Paper & forest products companies have strategically invested in technology to upgrade processing lines according to domestic regulatory constraints and international standards and to create solutions (i.e. new products) to meet the environmental demands of their customers.
- Proactive firms have found opportunities in environmental pressures, developing alternative means of product manufacturing by using different materials and adapting production processes, going beyond minimal adaptation techniques focused on compliance. Profit generation results from opportunities created by environmentally oriented consumers
- Driven by governments' environmental protection efforts and by the reduced availability of virgin wood fiber, the forest products industry worldwide has invested in product technology and product stewardship, to improve the range of recyclable materials and dramatically increase its use of recycled fibers.
- In the wood products area, the need for replacement sources of timber has spurred the birth of the engineered wood products industry. Many mills that don't have access to enough old-growth timber to make products like lumber and plywood have decided to manufacture engineered wood products instead. These engineered products are made from wood residue

or small-diameter logs, which are readily available from forests not subject to prohibitive environmental restrictions

- The industry has made concerted efforts to reduce landfill as more paper continues to be recovered for recycling than land-filled. In 2001, there was another strong decline in paper going to landfill, from 40.6 million tons in 2000 to 36 million tons in 2001. This has been an important environmental benefit.
- As fiber supplies have become more restricted, the forest products industry has renewed its attention to non-wood fiber sources that come from annual crops such as kenaf, hemp, and wheat straw.

Financial impacts

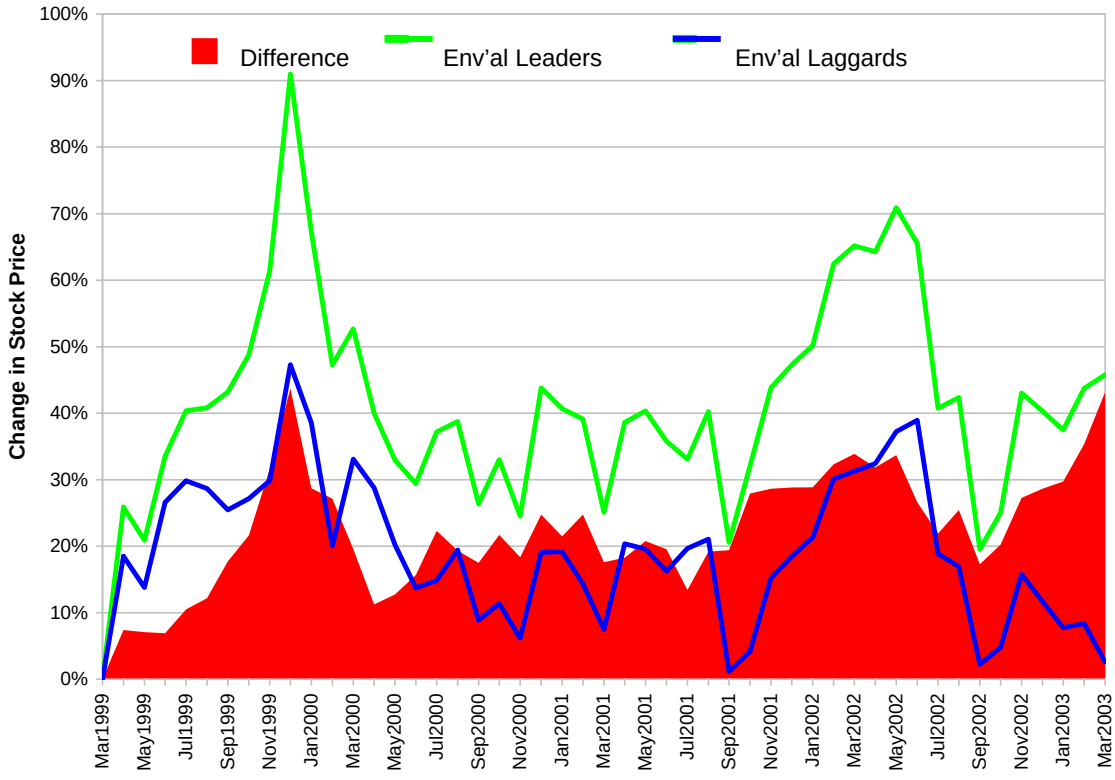
Fundamentals

Share price performance

As shown in the figure below, companies with above average environmental governance standards and above average environmental track record financially outperformed companies with below average ratings by more than 43% (4,300 basis points) over four years from March 1999 to March 2003.

Figure 8

Percentage Change in Total Return of Environmental Leaders v Laggards in the Paper and Forestry Sector 1999 - 2003



NB Figures and results based on Innovest proprietary ratings of above and below average performers

Paper and Forestry Product Company Rankings

Company	Ranking
Aracruz Celulose S.A.	Top Tier
Canfor Corporation	Top Tier
Georgia-Pacific Corp	Top Tier
Holmen AB	Top Tier
Intl Paper Co	Top Tier
Klabin S.A.	Top Tier
M-REAL OYJ	Top Tier
Nexfor Inc.	Top Tier
Norske Skog AS	Top Tier
Stora Enso Oyj	Top Tier
Suzano Bahia Sul[1]	Top Tier
Svenska Cellulosa AB	Top Tier
Tembec Inc.	Top Tier
Votorantim	Top Tier
Weyerhaeuser Co	Top Tier
Abitibi-Consolidated Inc.	Middle Tier
Cenibra	Middle Tier
Domtar Inc.	Middle Tier
MeadWestvaco Corp.	Middle Tier
Oji Paper Co., Ltd.	Middle Tier
Ripasa S.A.	Middle Tier
UPM-Kymmene Corp.	Middle Tier
Boise Cascade Corp	Bottom Tier
IP do Brasil	Bottom Tier
Louisiana Pacific Corp	Bottom Tier
Nippon Unipac Holding	Bottom Tier
Paperlinx	Bottom Tier
Potlatch Corp	Bottom Tier
Temple-Inland Inc	Bottom Tier

Table 15
Based on Innovest proprietary ratings

Other financial metrics

Top performing stocks also posted superior results over low scoring companies in various business performance and market valuation ratios:

- Operating Profit Margin, 14.8% versus 5.0%
- Net Profit Margin, 3.7% versus 1.2%
- Return on Equity, 3.2% versus 1.1%
- Return on Assets, 1.6% versus 0.8%
- Price/Earnings Ratio, 24.4 versus (19.8)
- Total Return – 5 Years, 21.5% versus 0.4%

But not with any discernable pattern in terms of:

- Price to Book Value (1.2 for both).
- Beta – the top-performing group was actually lower than that of the bottom group (0.58 versus 0.79).

Intangibles

Corporate reputation

Forest products companies are sizeable users of forest resources worldwide as well as managers of raw materials upon which many communities base their livelihoods. Companies are therefore scrutinized by international NGOs and local groups, and are vulnerable to changing public sentiment. Companies that pursue advanced SFM practices and certification systems often have superior management capacity to deal with complex, somewhat intangible forces acting upon them, and modify their strategies accordingly. Leaders in this area usually have low regulatory risk exposure, improved value of owned forest holdings, more access to non-corporate-owned forest resources, product differentiation in highly commoditized markets, corporate image protection and enhanced reputation.

Other benefits reported by companies pursuing certification include potentially lowering finance and insurance costs by lowering risk profiles, improving employee morale and productivity and gaining access to new markets. Certification costs vary from company to company, and country to country. Those already pursuing excellent forest management will have the lowest certification costs. Ultimately, consumers will expect certification of SFM practices and certification will become a key purchasing criterion on a par with price and quality.

Competitive advantage

In expanding their operations to emerging markets such as Asia and Latin America, forest products companies are seeking new sources of raw material, new markets for traditional products, lower labor and manufacturing costs and less stringent environmental regulations. While they may find these conditions, which offset constraints at domestic operations, firms have also discovered that they have to implement sophisticated management strategies to sustain their business in these regions. Superior management is necessary to deal complex stakeholder relations (i.e. highly forest-dependant communities and aboriginal groups) and steadily increasing environmental regulations, which are often quickly implemented in reaction to spills, boycotts, industrial sabotage and community pressure. Corporate reputation and the profits of forest products companies, as well as firms of other high-impact sectors, have been seriously affected by litigations in international courts over environmental shortcomings or misconduct.

Forest products companies with CFPs in their product portfolio consider certification a competitive advantage and also a tool to enhance their brand image through corporate responsibility. Awareness of the need for certification is growing. A recent study by the European Forest Institute found that over 60% of companies thought that a widely used timber certification system, such as FSC, was needed. As consumers demand more environmentally-friendly products, profit generation can result from the use of eco-labels and these are recognised as passports to enter markets where consumers favour such products. In certain environmentally driven markets, governments have established eco-labels for forest products that exact certain environmental standards throughout the manufacturing process. One of the most important of these initiatives, from a market perspective, is the Nordic Swan Eco-Label adopted by the Nordic Council of Ministers. The system is a voluntary, positive eco-labeling scheme in the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden). The objective of the system is to provide information to consumers and enable them to select products that are the least harmful to the environment. Manufacturers around the world that want to market their products in the Nordic countries and want to demonstrate to potential customers their outstanding environmental performance are eligible to obtain the eco-label.

Beyond eco labels, top competitors are focusing on new business opportunities through environmentally driven product development plans. Many have entered the recycling market, reusing industrial byproducts to create new product lines and also the use of alternative fibre resources. As fiber supplies become more restricted, the forest products industry will be forced to be even more efficient and creative in its use of fibre resources, from the forest up the value chain to final distribution. It has renewed its attention to non-wood fibre sources that come from annual crops such as kenaf, hemp, and wheat straw.

New markets

Forest products companies with CFPs in their product portfolio consider certification a competitive advantage and also a tool to enhance their brand image through corporate responsibility. Awareness of the need for certification is growing. A recent study by the European Forest Institute found that over 60% of companies thought that a widely used timber certification system, such as FSC, was needed. As consumer demand more environmentally-friendly products, profit generation can result from the use of eco-label and these are recognized as passports to enter markets where consumers favour such products. In certain environmentally driven markets, governments have established eco-labels for forest products that exact certain environmental standards throughout the manufacturing process. One of the most important of these initiatives, from a market perspective, is the Nordic Swan Eco-Label adopted by the Nordic Council of Ministers. The system is a voluntary, positive eco-labeling scheme in the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden). The objective of the system is to provide information to consumers, to enable them to select products that are the least harmful to the environment. Manufacturers around the world that want to market their products in the Nordic countries and want to demonstrate to potential customers their outstanding environmental performance are eligible to obtain the eco-label. Beyond eco labels, top competitors are focusing on new business opportunities through environmentally driven product development plans. Many have entered the recycling market, reusing industrial byproducts to create new product lines and also the use of alternative fiber resources. As fiber supplies have become more restricted, the forest products industry will be forced to become even more efficient and creative in its use of fiber resources, from the forest up the value chain to final distribution. It has renewed its attention to non-wood fiber sources that come from annual crops such as kenaf, hemp, and wheat straw.

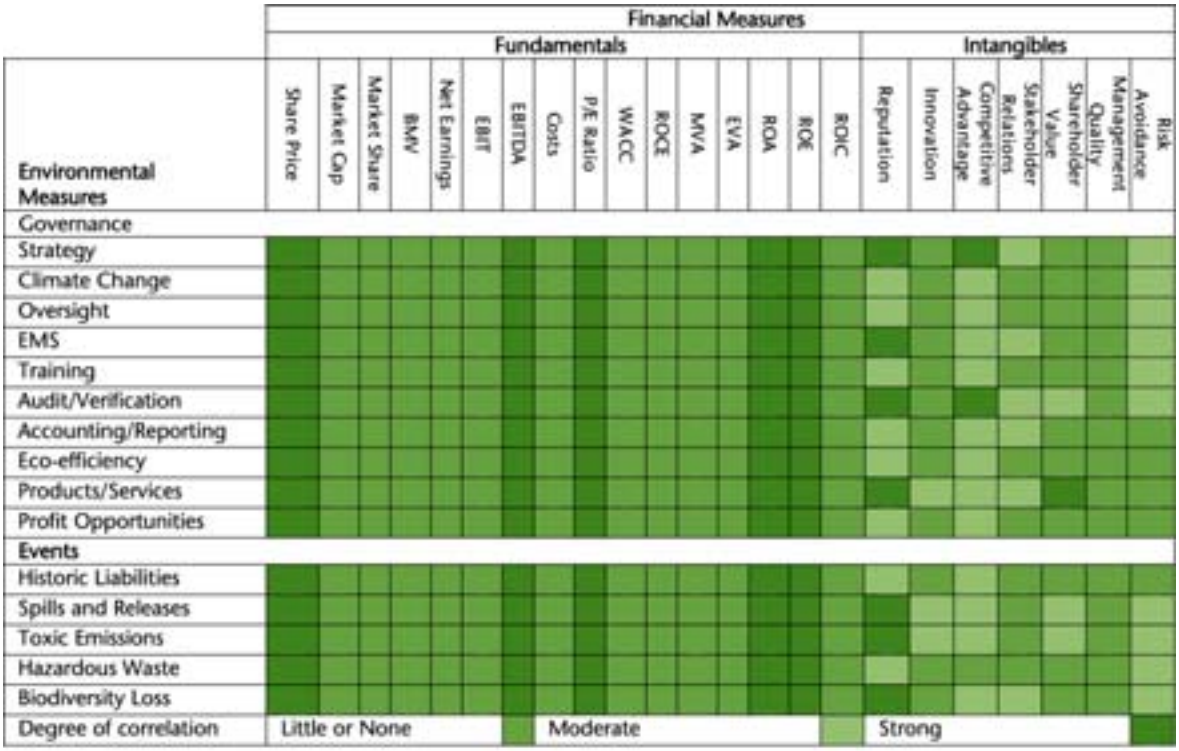
Risk avoidance

Strong environmental management policies and good stakeholder relations are a common feature of sector leaders. The existence of this and systems to support these areas can help companies to identify emerging risk factors, adapt to pending regulation thereby reducing future costs and highlight potential opportunities. Sector leaders have strong board oversight, senior management commitment and consistent application of standards across all operations, both domestic and international. Innovative environmental strategies create an advantage for companies that are seeking access to environmentally-driven markets, such as Europe and North America, attempting to reduce or maintain reputational risk, access capital markets on acceptable terms (particularly in developed countries), decrease insurance costs, and minimize long-term operating capital costs. A positive stakeholder strategy can create the permission to access valuable forest resources in emerging markets, reduce local exposure to reputation damage and avoid product boycotting by large customers. Leading firms have partnered with local and international organizations to attain agreements on land productivity and the conservation of forest values. Positive results of such alliances' focus are improvement of corporate brand value and environmental performance. Companies that have taken a proactive approach to stringent environmental regulations have learned that the adoption of pollution control technologies creates reductions in operating costs. For instance, Swedish manufacturers have reported that efforts to comply with regulations and improve their environmental performance have reduced operating costs by approximately US$20 per ton.

Operational Efficiency

Forest products companies worldwide have taken notice of innovative production methods aimed at reducing emissions from different industry manufacturing processes. In general, the drive to improve efficiency was driven by government rejections of 'end of pipe treatments'. Companies that have taken the lead on this matter have been able to provide unique insights to the whole forest products industry on equipment and processes, and have patented their findings. These companies have also recognized new business opportunities in extending their technology to other manufacturers. European companies, mainly Scandinavian and German, and firms from the United Sates, have taken the most of this market share. In addition, the environmental concerns of forest products companies have affected equipment suppliers by increasing market opportunities for oxygen delignification systems.

Appendix – summary of financial impacts identified



Key

6. Sector Case Study – Water Utilities

Environmental leaders outperformed laggard companies by 4.5 percentage points over the three year period

Summary

The Sector

Companies in the water services sector reviewed in this case study are predominantly from Europe. Companies in this industry are public and/or investor-owned utilities, which extract and distribute treated water and then collect and treat waste water, while customers are municipalities, industries and individuals. Economies of scale are becoming more important in order to enlarge customer base and achieve a critical mass. Therefore, the largest companies are tending to become global players. Further, the most looking-forward companies are expanding into new environmentally-driven businesses, by offering non-regulated services such as water infrastructure construction and maintenance services.

Background

The nature of water as a vital resource and the heavy investments its exploitation requires resulted in a largely privatized industry, and one which is highly regulated to avoid discriminatory costs and to maintain public health standards. Stringent regulations, especially in the UK, made companies strive towards advanced environmental performance in order to be competitive and maintain financial strength. Leaders in this sector have integrated environmental skills into their management, processes and R&D to deliver best practice standards.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Environmental policy and management systems	Share price	Strong - correlation-based results provide evidence that environmental leadership is valued by the market	Leaders outperformed laggard companies by 4.5 percentage points (450 basis points) over the three year period 1997 to 2000
Eco-efficiency responses required as operating margins become thinner for UK companies, because the regulatory body (OFWAT) has imposed new pricing constraints for 2005	Operating costs and earnings per share	Strong – operating efficiency will need to be high	£115 million reduction in revenues is expected
UK and US companies are coping with stringent environmental standards	Heavy investment in infrastructure and waste water treatment. May affect earnings per share	Strong – not able to pass all costs to consumers	US companies will have to invest US$1 trillion to upgrade equipment over next 20 years. UK firms will need over £1.0 - £1.5 bn per annum to comply with the most stringent standards in Europe
Investment in cutting edge technologies such as micro-filtration is a means to get better, cheaper, faster and more economic environmental treatment	Operating margin	Moderate to Strong – varying levels of response by firms	Not measurable at this stage

Environmental governance

Issues

- Growing awareness of the scarcity of water. Water scarcity manifests itself in several ways, including a shortage of water supply, inaccessibility for consumers through infrastructure failure, or loss/leakage of water through poor maintenance of infrastructure.
- Water shortages can be exacerbated by the impacts of climate change, with changing rainfall patterns affecting levels of water in reservoirs and aquifers.
- Water is critical to human health and the water industry is therefore highly regulated. This can imply a high level of potential exposure to reputational risk where quality standards fall short.
- Environmental regulations are becoming increasingly stringent worldwide, with the goal of improving water quality and conservation practices. Leakage restrictions, wastewater and hazardous waste disposal requirements and related capital investments will increase accordingly.
- National environment agencies have the power to impose heavy fines for non-compliance and a 'naming and shaming' approach is becoming more commonplace. In the UK fines may be smaller than in other developed markets, but are high relative to fines made in other sectors in the UK.

Responses

- Water shortage has led to a consensus that countries and regions must adopt sustainable water management policies, while the implementation should be conducted by either public or private companies in charge.
- Due to lack of funds necessary for investing in much needed water infrastructure improvements, many governments have privatized or are in the process of privatizing water utilities.
- Due to public and governmental pressure to ensure high water quality and low prices, leading firms have adopted sustainable water management schemes and now integrate environmental issues into the overall business strategy, partly as a source of competitive advantage.
- Stringent regulatory controls directly affect companies, since they must respond rapidly to and anticipate changes required by regulation. Companies must therefore have the processes and people in place to track the latest regulatory developments in order to comply. Leading companies anticipate regulatory changes by working with associations and regulatory agencies to set industry-wide environmental standards.
- New legislative developments accelerate the need for innovative analytical tools and equipment to identify pollutant containment levels, and to upgrade infrastructure and build filtration plants for drinking water and waste water systems.
- Leaders seek to enhance eco-efficiency through increasing recycling, development of new technology and alternative energy sources. Sewage sludge is re-used in agriculture and land reclamation or disposed of in incinerators. They also offer customers free advice on water use efficiency.

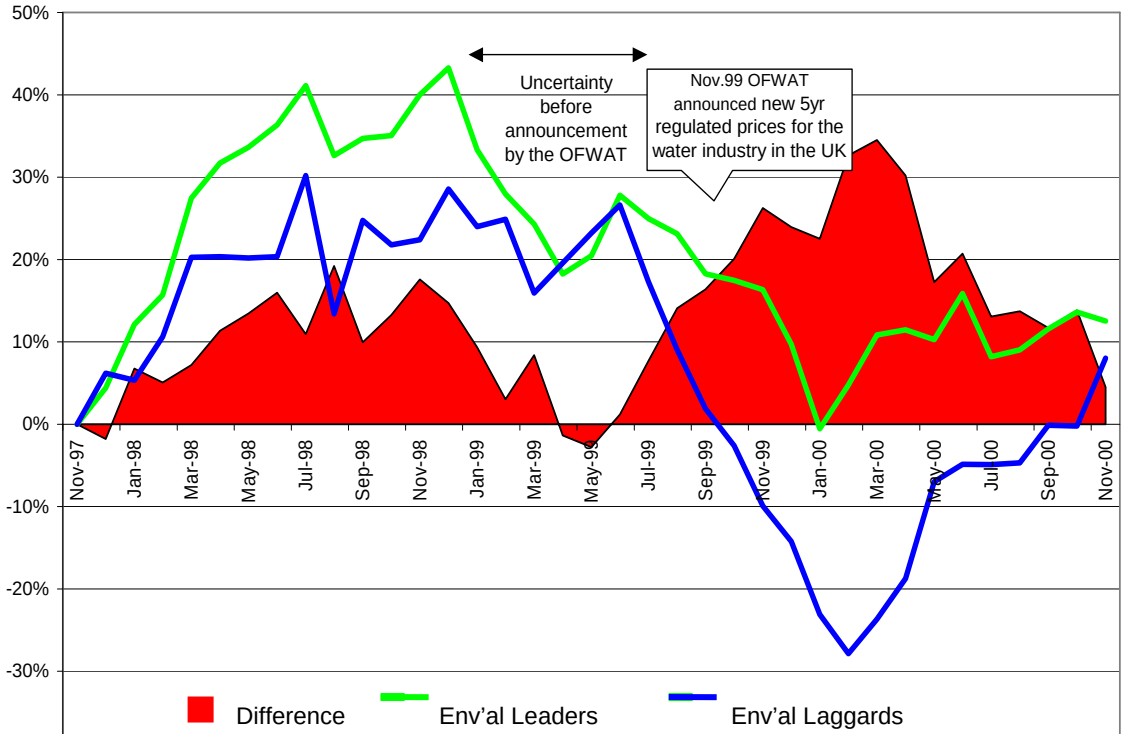
Financial impacts

Fundamentals

Share price performance

Figure 14

Percentage Change in Total Return of Environmental Leaders v Laggards in the Water Utilities Sector

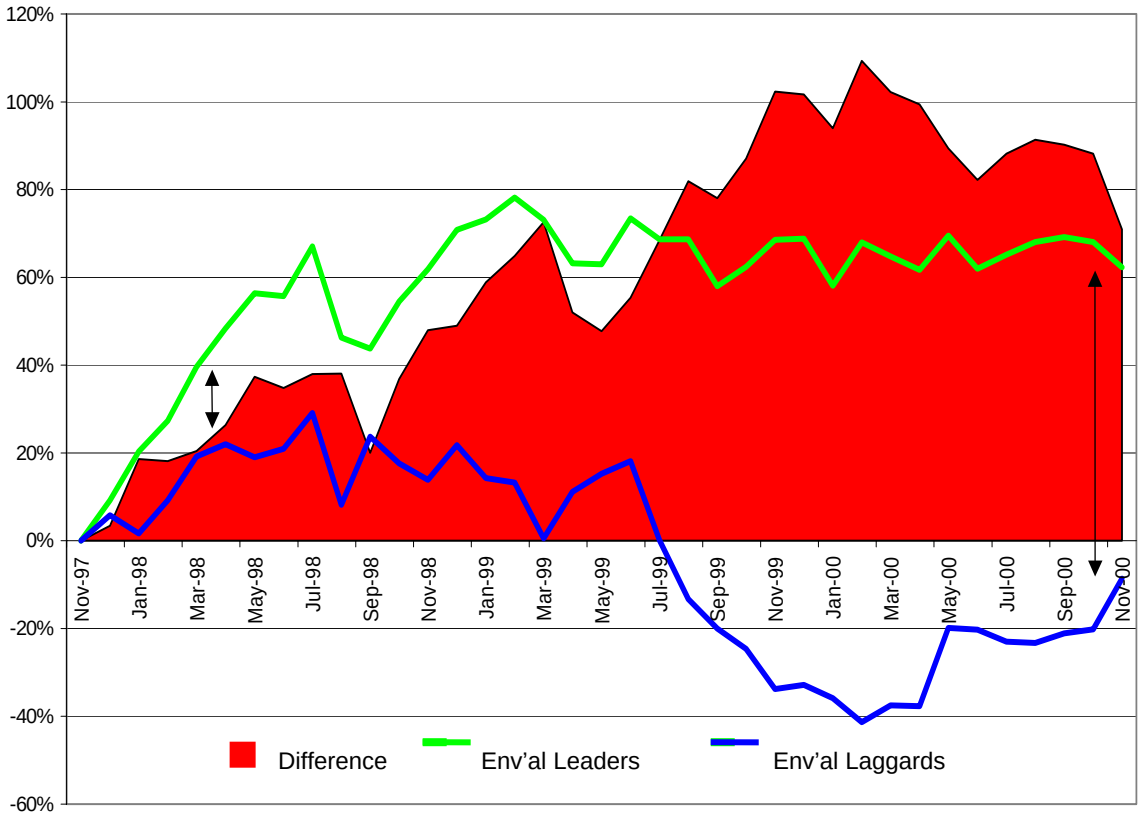


NB Figures and results based on Innovest proprietary ratings of above and below average performers

As shown in the figure 8 above, companies that demonstrate strong environmental policy and management outperformed laggard companies by 4.5 percentage points (450 basis points) over the three year period 1997 to 2000. It is also possible to look at stock performance excluding the UK water companies.

Figure 15

Percentage Change in Total Return of Environmental Leaders v Laggards in the Water Utilities Sector, excluding UK companies



NB Figures and results based on Innovest proprietary ratings of above and below average performers

Figure 9 shows that the returns differentials between environmental leaders and laggards significantly increase when the companies operating in the UK water industry are excluded. In the highly regulated UK water supply business, corporate operating margins are falling due to increasing pressures from regulated prices.

Water Utilities Company Rankings

Company	Ranking
Severn Trent PLC	Top Tier
Vivendi	Top Tier
AWG Group	Top Tier
Suez Lyonnaise des Eaux	Middle Tier
Pennon Group PLC	Middle Tier
Kelda Group PLC	Middle Tier
Waste Recycling Group PLC	Middle Tier
Shanks Group	Bottom Tier
United Utilities PLC	Bottom Tier
American Water Works	Bottom Tier
WMI Inc	Bottom Tier
Allied Waste Inds Inc	Bottom Tier

Table 16

Based on Innovest proprietary ratings

Intangibles

Sustainable strategy to cope with stringent regulations

In the UK water companies have been faced with pricing constraints by their economic regulator, OFWAT, which declared new price cuts in November 1999 that finally took effect in April 2000 under the mandatory five-year review (2000-2005). This, together with new mandatory capital expenditures, has substantially reduced the operating margins of UK companies. For example, Severn Trent water charges were reduced by 14.1% in April 2000, with a further 1% reduction in each of the following two years.

This implied a £115 million reduction in revenues in the regulated water business in the first year and a further reduction of £9 million a year in each of the following two years. In turn, domestic growth potential is limited given the maturity of the business and legal restrictions on mergers of British water companies. Even though stock market prices of the four UK Water Companies were adversely impacted by OFWAT regulation, companies that had leading environmental management and performance such as Severn Trent and Anglian Water outperformed companies that lagged behind by 960 basis points from February 1999 to October 2000. Progressive companies have been responding to this regulatory review by expanding into non-regulated businesses that generate value in the longer term.

According to official regulatory bodies and industry associations, companies in the US will have to invest approximately US$1 trillion to upgrade the water infrastructure and build new treatment plants over the next 20 years; and companies in the UK will need to invest approximately £1.0 - 1.5 billion per yearin order to comply with stricter water and waste water environmental standards. For example, the estimated costs to comply with the tighter lead standard in England are around £330 million for 2000-2005.

Emerging business opportunities

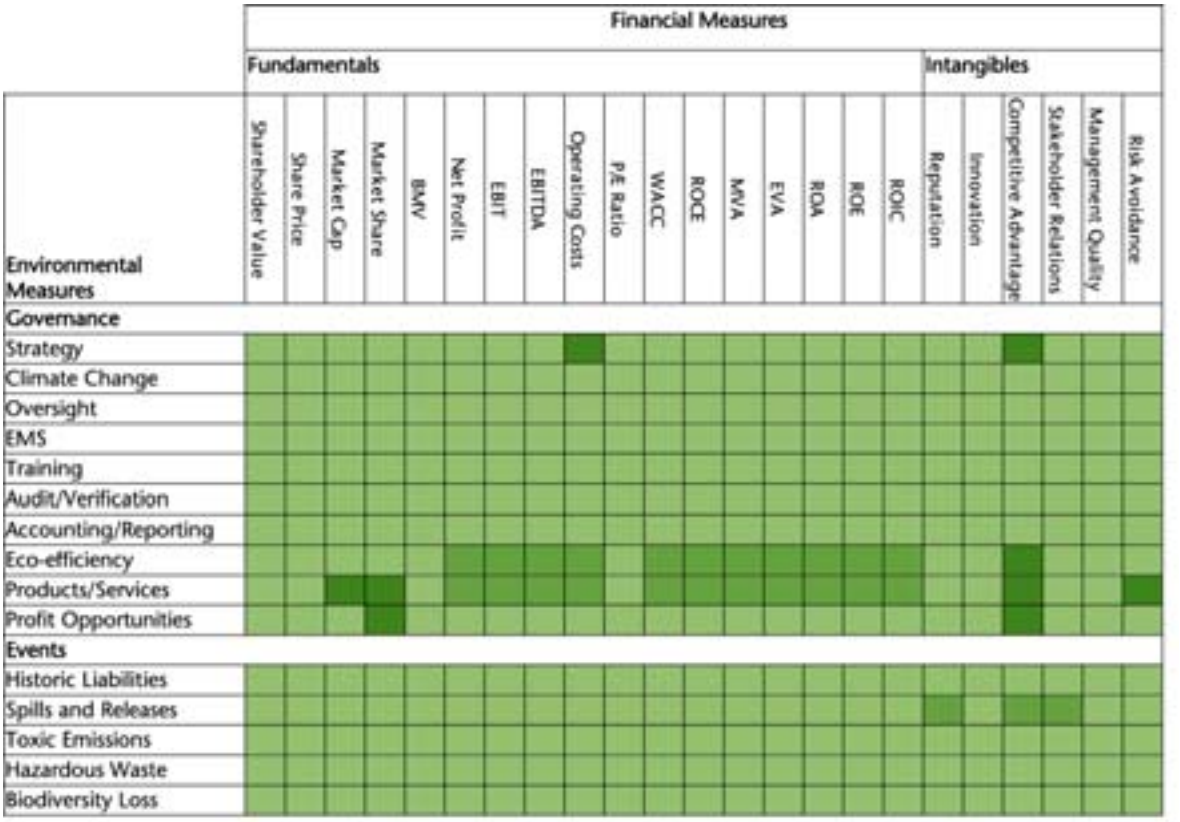
The privatization of water utilities and wastewater treatment works in several European countries has improved the international business competitiveness of EU companies. Companies from France and the United Kingdom have become by far the most internationally competitive for providing an integrated package of designing, building, managing, and even owning water infrastructure around the world. It is no coincidence that these companies have won major projects in Mexico, Brazil, Malaysia and Taiwan.

Furthermore, large European companies are expanding into the US water and waste water market. Their strategy is to enlarge their customer base by geographic expansion through acquisitions, gaining economies of scale, primarily in the US, where municipalities and industries increasingly outsource their non-core environmental services.

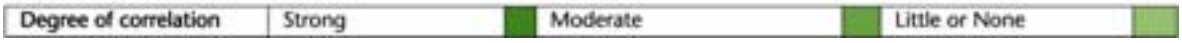
New technologies

Companies that achieve superior environmental and financial performance in a steadily more competitive environment are those that invest in and develop new technologies to satisfy the mounting pressure from public and regulatory agencies at the most efficient cost.
Thus, proposed new techniques such as micro-filtration and DNA chips which may be cheaper and faster technologies for quality control and water management could bring a commercial advantage to the companies that use them. The most proactive players invest heavily in such technologies and in R&D to develop innovative solutions with substantial economic and environmental benefits.

Appendix – summary of financial impacts identified



Key



7. Company Case Study – 3M

Pollution prevention programme yielded total savings of US$894m from 1975 to 2002

Summary

The Company

3M is a US-listed engineered products manufacturer. Its main business segments are industrial, transportation, health care, consumer/office, electronic, communications and specialty materials. 3M integrates environmental management into its overall business strategy. Progressive and proactive in terms of its environmental approach, 3M is particularly successful in lowering costs via sound environmental management. 3M is also a leader in designing eco-efficient products.

Background

3M is ahead of the curve in that it integrates environmental activities into a traditional management strategy. Its EHS management system was formalised in 2001, and focuses on pollution prevention, recycling, regulatory standards, and eco-efficient product development. In the UK all bar one of 3M's manufacturing facilities are ISO 14001 certified – the exception being a recent acquisition which was working towards certification by the end of 2003. All 3M manufacturing sites worldwide that produce products for global markets are to be certified to ISO 14001. The company sets five year plans to measure itself against, in line with GRI guidelines, producing an annual scorecard of achievements against targets. 3M also utilizes life cycle management to improve the environmental, health and safety impact of its products and processes, which should considerably reduce future environmental liability.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Pollution Prevention Pays (3P) program, adopted in 1975, has been a key part of 3M's environmental strategy. From 1975 to 2002, this programme has prevented 857,282 tonnes of pollutants	Lower costs; improved operational efficiency	Strong – evidence that cost savings were achieved	In 2000, savings resulting from 3P projects amounted to US$22.4 million. In 2002, this figure was US$36.8 million. Total savings of US$ 894 million from 1975 to 2002
Implementation and development of environmental management strategy, formalised EHS management in 2001	Improved reputation	Strong – improvements in most indicators; awards for best practice	Global fines for the company were US$85,000 in 1998 compared to US$253,000 in 1990. 10% improvement in energy efficiency 2000-2002
Focus on eco-efficient product development, for instance, production of more environmentally friendly Scotchgard products following potential health concerns from compound found in previous product	Competitive advantage through new markets	Strong - significant investment in 'green' businesses	100 commercially applied and six consumer-applied protectors and cleaners

Environmental Governance

Issues

- In 2002, six years after 3M sold a site to the US government, government officials found a waste dump there from a former printing operation, which had been covered by vegetation. The US Justice Department and the National Park Service settled the CERCLA cost-recovery action brought against 3M as a result. The company had to pay £11 million to reimburse the federal government for cleanup.
- Asbestos exposure of £15.2 million in October 2001, arising from a case brought by 6 ex-employees, from exposure to asbestos in the 1960s and 1970s.
- In 2000 3M incurred a £106 million non-recurring cost associated with the phase out of perflourooctanyl (PFO)-based chemical products found in a range of its Scotchgard products. In response, 3M produced a reformulated, more environmentally-friendly Scotchgard for use by carpet makers. The product, introduced ahead of schedule in November 2000, was gradually phased in to the market.
- Whilst progressive and proactive in terms of environmental management, 3M does have a higher than average incidence of releases/sales for its sector. There were 60 non-fine notices of violations and permits exceeded worldwide in 1999 compared with 98 in 1990.

Responses

- From 1975 to 2002, 3M's 3P program has been a key part of its environmental strategy. The program seeks to eliminate pollution at source through development of new technologies and products, via product reformulation, process modification, equipment redesign, and recycling and reuse of waste materials. From 1975 to 2002, 3M's 3P program has saved £632 million, and prevented 857,282 tonnes of pollutants. In 2000, savings resulting from 3P projects amounted to £15.8 million. In 2002, this figure was £26 million.
- 3M sets 5 year plans to measure itself against, in line with GRI guidelines, producing an annual scorecard of environmental governance achievements against targets. Downward trend in air and water emissions, waste production. Improvement in energy efficiency.
- 3M set itself a target to improve efficiency by 20% during the period 2001-2005.
- 3M has also made significant progress in terms of air emissions. Between 1990 and 2000, a 93% reduction in volatile organic air emissions was achieved. Between 2000 and 2002, there was a further 25% reduction in volatile air emissions. 3M set a target to reduce volatile air emissions by a 25% between 2001 and 2005.
- US EPA Toxic Release Inventory (TRI) releases have seen significant improvement. Between 1990 and 2000, there has been a 93% reduction, and between 2000 and 2002, a 38% reduction in TRI releases. The target set in the latest 5 year plan is to reduce TRI releases by 50% between 2001 and 2005.
- 3M reduced solid waste by 47% between 1990 and 2000, and by 12% between 2000 and 2002 between 2000 and 2002. Set itself a target to reduce waste by 25% between 2001 and 2005.
- Set a target to double the number of 'Pollution Prevention Pays' (3P) projects from 194 for the previous 5 year period (1995 – 2000) to 400 projects in this period (2001 – 2005).

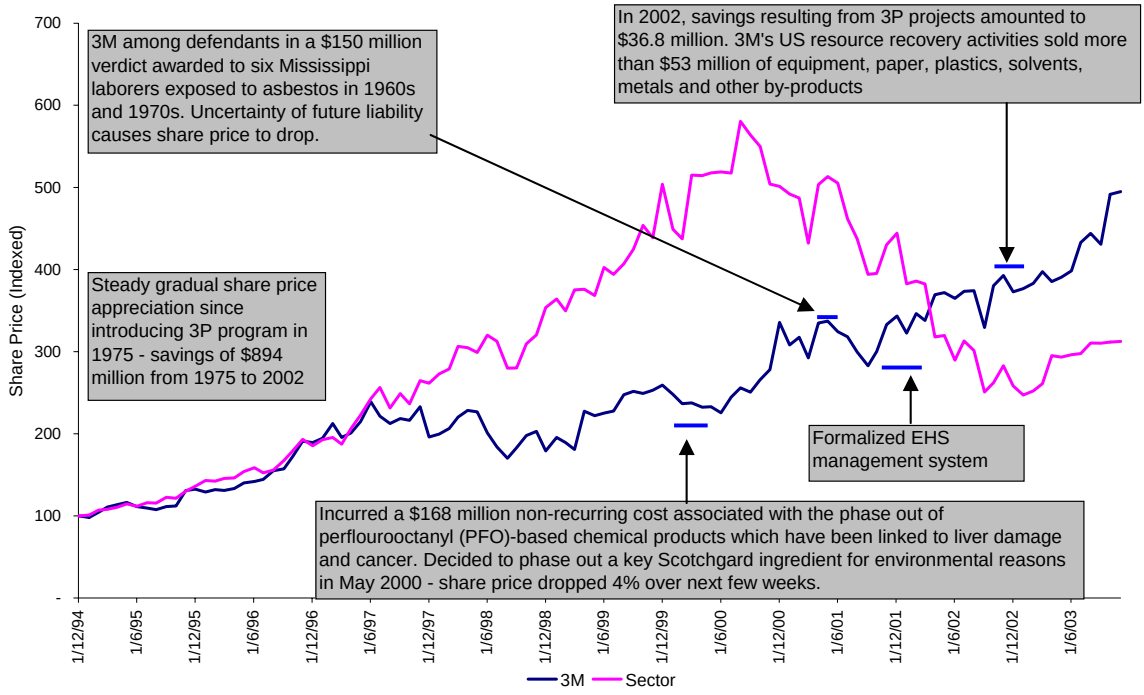
Financial impacts

Fundamentals

Share price performance

Figure 9

3M Share Price (indexed) vs S&P 500 Industrial Conglomerates (indexed)



3M's share price appreciated fairly gradually from the late 1980s until the mid-1990s, during a period where the group did not have a distinct, overarching environmental strategy and like other industrial conglomerates, had been cited as a repeat offender in terms of pollution. More recently, however, whilst the rest of the industrial conglomerates sector has languished in the doldrums since mid-2002, 3M's share price has significantly outperformed its counterparts.

This can be attributed to a host of factors, including strong sales in its occupational HSE unit (see below – 'Competitive Advantage').

In 1975 3M adopted its voluntary 'Pollution Prevention Pays' (3P) programme, based on the idea that pollution prevention is both an environmental as well as a financially viable strategy. The aim of the strategy was to eliminate pollution at source, through product reformulation, process modification, equipment redesign and recycling and reuse of waste materials.

Intangibles

Corporate reputation

3M has certainly built a strong brand, particularly renowned for specific products, some of which are described below.

Competitive advantage and new markets

A well integrated life cycle management system has resulted in the manufacturing of products such as respirators, hearing protection products, air monitoring devices, environmental safety products, recycling-compatible label materials for plastic electronic equipment, water based contact adhesives, CFC-free asthma inhalers and the CFC replacement HFEs. 3M has shown strong sales in its occupational HSE unit, for instance, it received a US$27 million contract from the US Advanced Battery Consortium for the second phase of developing a lithium polymer battery which has the potential to generate performance levels equivalent to gasoline powered vehicles.

Operational efficiency

Operational efficiency gains have been highlighted by 3M's pollution prevention programme, which have resulted in savings of £632 million since 1975. With targets to improve efficiency by 20%, reduce emissions and solid waste by 25%, and TRI releases by 50%, during the period 2001-2005, operational efficiency gains look set to continue.

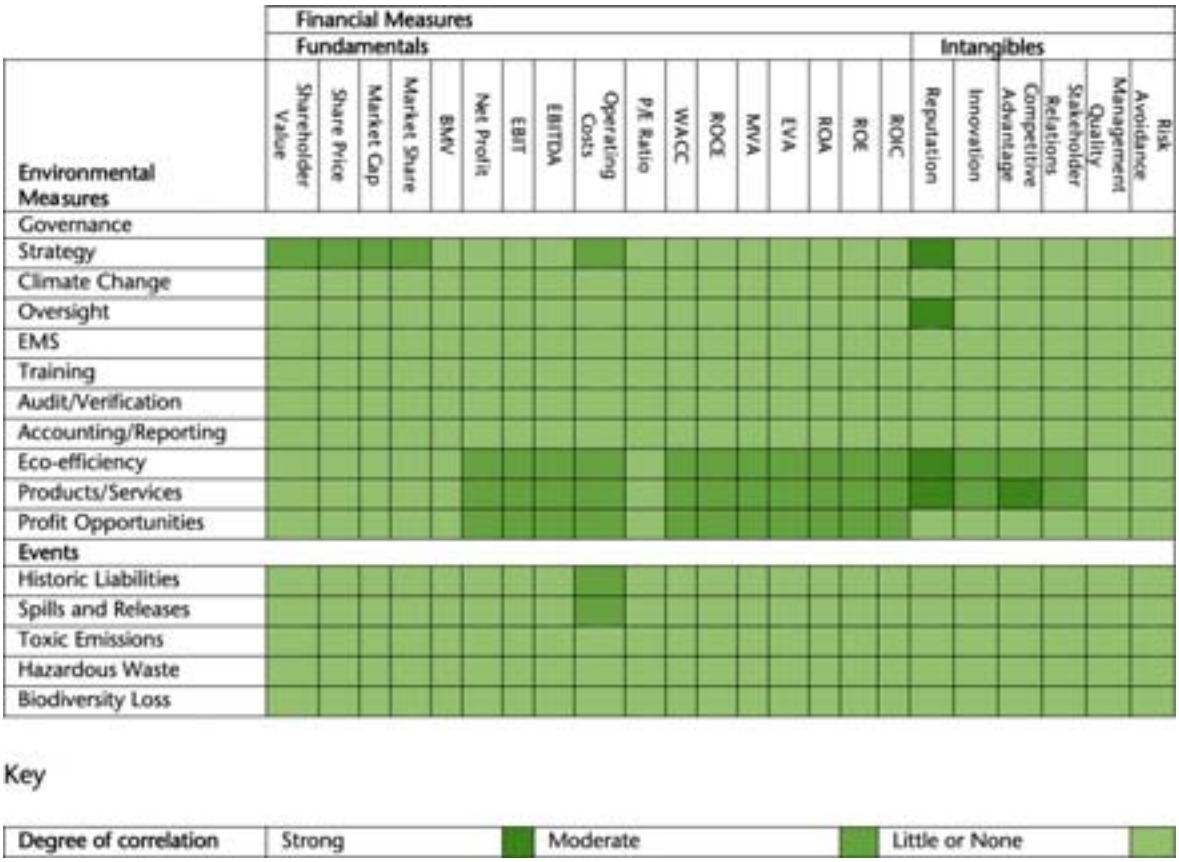
Risk avoidance

In 2000, 3M incurred a £106 million non-recurring cost associated with the phase out of perflourooctanyl (PFO)-based chemical products which have been linked to liver damage and cancer. In October 2001, 3M was among the defendants in a £102 million verdict awarded to six Mississippi labourers who were exposed to asbestos in the 1960s and 1970s. 3M appealed its portion of the verdict, US$22.5 million. However, news of this asbestos liability came at a time when third-quarter earnings at 3M fell 21% as the manufacturer was hurt by the softening global economy.

In 2002, six years after 3M sold a site to the US government, government officials found a waste dump at the site from a former printing operation. The waste had been covered by vegetation. The US Justice Department and the National Park Service settled the CERCLA cost-recovery action brought against 3M as a result. The company had to pay US$15.5 million to settle the CERCLA cost-recovery action to reimburse the federal government for cleanup.

3M's recent decision to incorporate environmental management strategies into its overall business approach should benefit the company as it steals a march on its competitors in developing products that are less likely to lead to future environmental liability. The adoption of eco-efficient manufacturing methods has also lead to more flexible plant configuration and enhanced productivity.

Appendix – summary of financial impacts identified



Key

Degree of correlation	Strong	Moderate	Little or None

8. Company Case Study – Baxter International

Environmental management initiatives saved US$64.7 million in 2002.

Summary

The company

Baxter International, founded in 1931, has three main business lines; bioscience, medication delivery and renal. The bioscience area produces plasma proteins to treat haemophilia and other blood-related disorders, providing the largest sales. The medication delivery business manufactures intravenous and injectable medications and systems for delivering those medications, and the renal therapy business makes products such as dialysis equipment. The company employs 50,000 in more than 100 countries and in 2003, sales reached $8.9 billion.

Background

Baxter provides a model for environmental management, reporting and accounting and has consistently strived for high standards. This has set the company apart from others in the sector. The company has had comprehensive systems in place since 1991 and was one of the first pilot companies to report under the Global Reporting Initiative (GRI) when it was established in 1999.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Leading environmental governance standards, consistently raising the bar in terms of progressive efforts to reduce environmental impact of operations since 1991	Improved reputation	Low to moderate - consistently improving share price, but difficult to pinpoint to environmental efforts	Compounded annual return to shareholders from 1993 to 2002 increased 25%
Systematic monitoring, recording and target setting to reduce environmental risks to business	Cost savings and cost avoidance in dollars	Strong – cost reductions	Improvements saved $12.7 million in 2002, with cost avoidance at $52 million (from efforts initiated in the six years prior to the report year)
Evolution and development of environmental leadership, more recently with a focus on energy conservation and climate change.	Improved reputation; improved operational efficiency	Strong – inclusion in leading ethical indexes	Energy reduction methods resulted in cost savings and avoidance of $28 million from efforts initiated between 1996 and 2002

Environmental governance

Issues

- The industry is growing as more companies are becoming positioned to serve the growing and aging population which is increasing healthcare demands. The effects of the post-WW2 baby boom reaching a peak, millions now in their middle age, means people in general are living longer and the trend is likely to continue. Despite growing levels of business, the industry has challenges to reduce its ecological footprint.
- While environmental concerns are not central to the healthcare industry, there are an increasing number of initiatives to address such issues. These include reducing packaging and the purchase of PVC plastic, mercury reduction programs, efforts to reduce incineration and

use reusable over disposable items. Such trends have an impact with hospital needs being one of the key drivers of the healthcare equipment and suppliers industry.

- Heightened awareness over the environmental damage of products following disposal. There is environmental pressure to reduce the use of mercury and some European countries have imposed bans. In many cases, companies are subject to legislation such as the US Mercury Bill prohibiting the sale of mercury thermometers and managing mercury stock piles.
- The emergence of environmental groups campaigning for greener healthcare, having an impact on the products and services of healthcare equipment and providers. In 1999, Health Care Without Harm launched a campaign to phase out PVC in products due to dangerous carcinogens released during incineration and leaching of toxins during use of IV bags and tubing.
- The emergence of 'green' purchasing and its increasing popularity as sustainable development generally becomes more strategically important for companies and governments.
- Due to the scope of the company's manufacturing operations, Baxter's environmentally-related liabilities have been above average for the sector. Baxter has been named as a Potentially Responsible Party (PRP) at eight Superfund sites and liable for clean up costs. Estimated exposure to this is $2 million.
- Wastewater has emerged as a challenge for Baxter. For example in 2002, of the 20 notices of violation (NOVs) received in 2002, 19, and additionally one cease & desist order, were in relation to wastewater.
- Due to the nature of the manufacturing operation, risk exposure apparent in terms of toxic air emissions and releases from sterilisation processes.

Responses

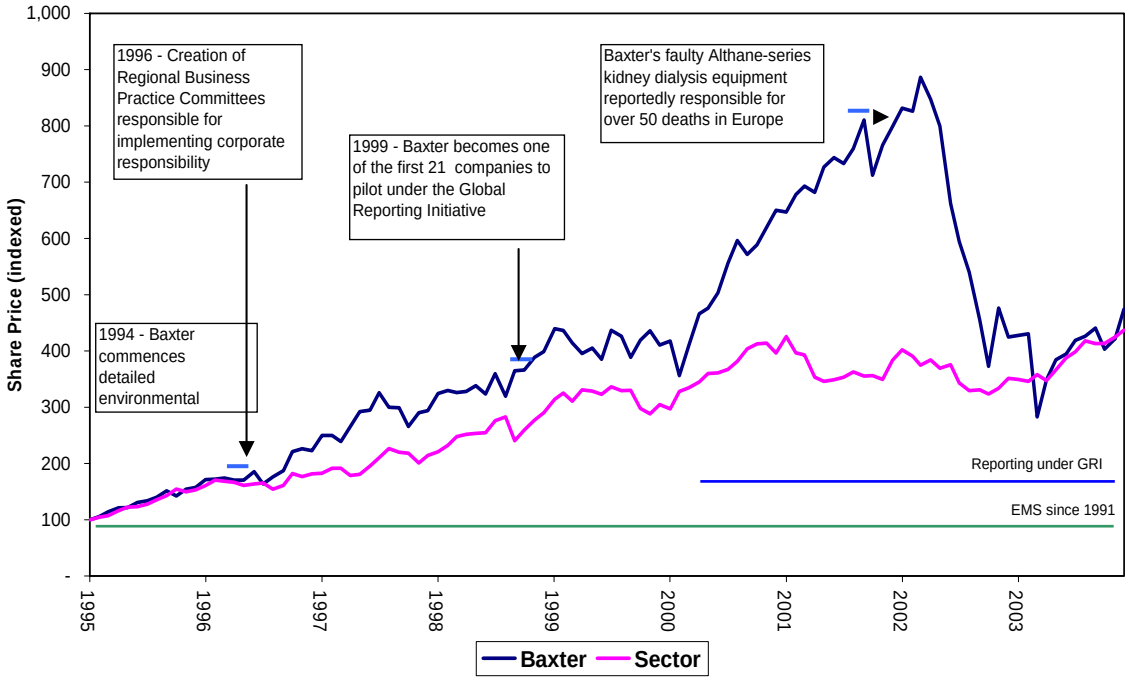
- Increasing evidence of good environmental governance with a clear environmental management framework, senior level commitment and accountability. Baxter has developed by far the most proactive environmental policies and practices in the sector.
- Baxter joined the GRI in 1999 and has made significant efforts to educate itself in emerging sustainability issues.
- Implementation of group-wide EMS in 1991 going beyond ISO 14001. Committed to ISO 14001 certification at all major sites.
- Highly advanced environmental cost accounting system and has published environmental balance sheet since 1994.
- Publication of sustainability report, now in fourth year which has improved transparency and stakeholder relations. Environmental auditing and third party verification by ERM Certification and Verification Services. Reporting activities audited against the Good Environmental Reporting Principles (GERP) which were developed with CERES.
- Baxter is developing a more aggressive waste reduction strategy and seeing a downward trend in toxic air emissions which have been reduced by 99% since 1988 levels.

Financial impacts

Fundamentals

Share price performance

Figure 16
Baxter International Share Price (indexed) vx S&P 500 Healthcare Equipment



Baxter's share price rose between 1996 and 2003, a period where the company introduced some progressive environmental practices. But several other factors have of course had an appreciable impact on share price. At the end of January 2000, Baxter posted exceptional Q4 results, reported strong earnings growth and sales (which exceeded 1999 targets). Net sales grew 12% and net earnings were up 17%. On active trading the stock price rose 9% on 27 January. Over the same period, Baxter made a number of significant acquisitions across all of its businesses including Immuno (transforming the company's BioScience business), Ohmeda, Cook, ESI Lederle and North American Vaccine. During this period Baxter also sold Allegiance Healthcare Corporation and Edwards Lifesciences Corporation and other positive news included the announcement of its smallpox vaccine contract. Furthermore, Baxter successfully completed a $500 million share repurchase program.

Baxter had a good year generally during 2000 which saw continued rising demand for Factor VIII (in 2000 the company tripled production capacity), the acquisition of Vaccine Inc (seen by financial community as a market expected to grow considerably over next few years), and the launch of the first generic propofol (used by anaesthesia business) following a patent expiry - sales exceeded $100 million in 2000 for this product alone.

Operational costs

As the table below shows, Baxter's efforts have resulted in a significant reduction of operating costs. Environmental efforts saved $65 million in 2002.

	2002	2001	2000
Environmental Costs ($ million)	**23**	**22**	**23**
Environmental Savings ($ million)			
Air Toxics Cost Reduction	0	0	0.1
Hazardous Waste Disposal Cost Reductions	-0.2	-0.2	0.2
Hazardous Waste Material Cost Reductions	-1.2	-0.5	1
Non-hazardous Waste Disposal Cost Reductions	0.6	-0.6	0
Non-hazardous Waste Material Cost Reductions	4	-2.5	3.9
Recycling Income	2.1	1.8	3.5
Energy Conservation Cost Savings	4.3	2.7	2.8
Packaging Cost Reductions	2.9	2.5	1.3
Water Conservation Cost Savings	0.2	0.1	0.1
Total Cost Savings ($ million)*	**13**	**3**	**13**
Cost Avoidance From Efforts Initiated Since 1996 ($ million)	**52**	**57**	**61**
Total Income, Savings & Cost Avoidance ($ million)*	**65**	**60**	**74**

Source: Baxter International (based on estimates)

Table 8

Recycling level has increased by 12% since 1996. Since 2000, $7.4 million in revenue has been created. Baxter has benefited from focusing on eco-efficiency and energy conservation. The company's progressive efforts in this area have resulted in estimated cost-savings of $4.3 million in 2002. Baxter also estimates that energy reduction methods in place since will save more than $30 million annually in 2005. Energy reduction methods resulted in cost-savings and avoidance of $28 million from efforts initiated between 1996 and 2002 alone. Projects in 2002 reduced packaging by 3.7% from 1995 levels and saved Baxter $2.9 million. On a more localised scale, highlights include: $1.2 million saving at the company's Singapore facility due to a project to reduce sterilisation agents and packaging. In Mexico, reducing the thickness of IV bags by 20% has resulted in average quarterly savings of $91,000. At Turkish facilities, the Water Savings Team created engineering projects resulting in a 12% reduction in water use per unit of production, saving $35,000 per year.

Intangibles

Eco-Efficiency

As detailed in the previous section, Baxter has for some time been making significant progress in improving operational efficiency and reducing costs. Baxter has benefited from eco-efficiency improvements and energy conservation. Due to collaborative efforts between quality, EHS, manufacturing, purchasing and packaging teams, Baxter has reduced the use of raw material use per unit and further benefits from an increase in recycling (60% of non-hazardous waste recycled in 2002), use of by-products and concentrated efforts with key suppliers in Europe and the US. Baxter is making significant savings from focusing on packaging (company aims to reduce actual levels 20% from 1995 levels). Additionally, Baxter's policy prohibits the use of packaging or packaging components—including inks, dyes, pigments, adhesives, stabilizers, or any other additive—to which lead, cadmium, mercury or hexavalent chromium have intentionally been added.

Product Stewardship

In a fairly fast paced industry such as healthcare, innovation is paramount. Companies that can identify emerging trends within CSR, including legislative changes will be able to differentiate themselves from companies which take a more reactive approach. By staying ahead of regulation, companies can increase sales as well as avoiding costs. While environmental concerns are not central to the healthcare industry, there are an increasing number of programs and groups aiming to improve the environmental impacts of the healthcare industry. These include reducing packaging and the purchase of PVC plastic (chlorine sources in dioxin creation in incinerators). There are also mercury reduction programs, efforts to reduce incineration and use reusable over disposable items where feasible. Such trends will have an impact with hospitals being one of the key drivers of the healthcare equipment and suppliers industry. There may be increased opportunities for companies to generate shareholder return and recognize future growth opportunities by looking more seriously at sustainability issues. Baxter feels significant business advantages result from product stewardship. This includes reducing manufacturing costs, meeting legal and regulatory requirements. Baxter considers environmental criteria at the R&D stage using checklists and process controls. In 2001, the company initiated a new tool called the Product Sustainability Review, the aim of which is to assess life cycle impacts of products on sustainability generally. As part of this process Baxter looks for ways to reduce environmental impacts during every stage of the product life cycle. Baxter's R&D teams also pursue 'Green Chemistry' initiatives to prevent pollution and waste. Such initiatives provide environmental benefits and cost savings and include hazardous substance substitution, reduction of toxins and limiting waste.

Management quality and reputation

Baxter has established an outstanding reputation for environmental responsibility, making clear its belief that this commitment will maximize value to the company and shareholders. The board was heavily involved in creating the original EH&S policies, becoming more involved in the 1980s with many new environmental laws and regulations, such as CERCLA. Good environmental governance systems are in place through the public policy committee, corporate responsibility office and regional business practice committees overseeing environmental standards and implementation across Baxter's operations. Baxter has had a formal environmental management system since 1991 and the majority of sites are covered by ISO14001 certifications consistent with the company's policy, which requires ISO 14001 certification at major sites. Additionally, sites are third party audited at approximately 40 locations to manage risks to the business. Such proactive efforts and future implementation will set the company apart from other companies in the sector. With maturing markets and a continued economic slowdown, such strategies will ultimately provide benefits. Additionally, Baxter has received widespread recognition for extensively reporting the financial impacts of environmental activity. Baxter's environmental accounting and reporting practices have served as a model since the early 1990s.

Stakeholder relations

The company has received 15 external environmental awards in 2002. Stakeholder outreach extends to local communities and Baxter is involved with environmental leadership programs such as the Business Environment Leadership of the Pew Center for Global Climate Change, Chicago Climate Exchange, Coalition for Environmentally Responsible Economies, the Global Reporting Initiative and World Resources Institute in addition to co-operating with campaign groups such as Hospitals for a Healthy Environment and Healthcare Without Harm. The company engages its customers in environment, health and safety matters through a Customer Advisory Council, which meets quarterly to identify sustainable solutions for Baxter and its customers.

Climate change risks

Baxter has demonstrated leadership in addressing the risks of climate change to the business. Baxter has a policy on climate change and engages with NGOs and governmental groups. Its environmental efforts include holding energy summits and employing over 65 energy managers, an intranet site devoted to energy use, ongoing assessments of renewable power sources, such as wind and solar energy, a best practice database as well as many internal initiatives to reduce energy use and cut emissions. Baxter has aligned itself with the Kyoto protocol and by 2005 plans to reduce energy and greenhouse gases by 30% per unit of production value compared to 1996 levels. The company reached toxic and CFC emissions reductions four years ahead of targets, reducing emissions 99% from 1988 levels. Additionally, Baxter is involved with groups such as U.S. Environmental Protection Agency's Climate Leaders Program and the Chicago Climate Exchange, which requires Baxter to offset some of its emissions and will facilitate experience with carbon trading.

Appendix – summary of financial impacts identified

	Financial Measures																					
	Fundamentals																Intangibles					
Environmental Measures	Shareholder Value	Share Price	Market Cap	Market Share	BMV	Net Profit	EBIT	EBITDA	Operating Costs	P/E Ratio	WACC	ROCE	MVA	EVA	ROA	ROE	ROIC	Reputation	Innovation	Competitive Advantage	Stakeholder Relations	Quality Management	Risk Avoidance
Governance																							
Strategy																							
Climate Change																							
Oversight																							
EMS																							
Training																							
Audit/Verification																							
Accounting/Reporting																							
Eco-efficiency																							
Products/Services																							
Profit Opportunities																							
Events																							
Historic Liabilities																							
Spills and Releases																							
Toxic Emissions																							
Hazardous Waste																							
Biodiversity Loss																							

Key

Degree of correlation	Strong		Moderate		Little or None	

9. Company Case Study – The Co-operative Bank

14% of 2001 pre-tax profits from customers stating that ethical policy (incorporating environmental issues) the most important factor in choosing Co-operative Bank. Continuing growth in profits and customer base.

Summary

The company

The Co-operative Bank is a full service clearing bank providing a range of retail banking products including current accounts, credit cards, loans, mortgages, saving and investments. The Co-operative Bank is a sister organisation to the Co-operative Insurance Society (CIS), the UK's only co-operative insurance company - owned and controlled by its members. In 2002 Co-operative Financial Services (CFS) was formed, bringing together the Co-operative Bank and the CIS under common strategic leadership. CFS is part of the Co-operative Family of Companies. This case study focuses on the Co-operative Bank's environmental governance approach and its impact on the financial performance of the bank.

Background

Over the last ten years the Co-operative Bank has gained a reputation for developing innovative products, offering high levels of customer service and a range of channels by which accountholders can access their money. At the same time the Co-operative Bank aims to be a modern bank that conducts its business in an ethical manner. The bank's high profile ethical stance makes it clear to customers which organisations it will and will not do business with, enabling customers to make an informed choice about the way their money is being used. The bank introduced its ethical policy in 1992, and made it a principle not to invest money in companies that damage the environment. 1996 saw the introduction of its ecological mission statement, and the bank is now incorporating key environmental principles into its overall ethical policy.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Introduction of ecological mission statement, now incorporating its key environmental principles into its overall ethical policy	Contribution to pre-tax profits	Strong - environmental considerations form part of this institution's overall business strategy.	In 2001, 14% of pre-tax profits came from customers who stated that 'ethics is the most important factor' in deciding to bank with the Co-operative Bank, 26% came from those who said 'ethics was an important factor' in choosing the bank.
As above	Competitive advantage	As above	During 2000 the Co-operative Bank's account base grew by 336,000 accounts and 280,000 customers, and continues to grow

Environmental governance

Issues

- Financial institutions play an important role in ensuring that environmental aspects of potential projects have been considered before financing a project, in line with international guidelines. Failing to fully investigate a potential borrower can lead to negative reputation consequences, e.g., underwriting deals in unsustainable projects.

- Financial institutions can strengthen underwriting and reduce claims risks by gaining a thorough understanding of the environmental risks facing clients and providing risk management services where appropriate to help them in reducing these.
- The EU Commission drafted a directive on civil liability on environmental damage in January 2002. The project is intended to give a sound set of objectives to determine the relevance and the range of environmental damage and the chain of liabilities.
- Implementation of environmental management systems can have a positive impact on day-to-day practices, quality of management, internal consistency and corporate culture.
- Even though the environmental impacts of a financial institution's business activities tend to be much greater than its day-to-day operations, the larger institutions do create significant impacts in terms of resource use, particularly energy-use including business travel.
- Real estate investment contains environmental and financial risk associated with contaminated sites. The leading financial institutions take into account possible financial damages inherited in such an investment including reduction in asset value, cost of investigation of polluted sites, clean-up costs for contaminated sites, toxic waste disposal and project delays in construction work. In order to avoid these costs, many banks investigate the sites in the context of due diligence.

Responses

- In 1992 the Co-operative Bank launched its ethical policy and 1996 saw the introduction of an ecological mission statement. The bank is now incorporating its key environmental principles into its ethical policy, by making a commitment not to invest money in businesses whose main activities are at odds with these ethical principles.
- In line with the principles of it ecological mission statement, the bank will not invest in any business whose core activity contributes to: global climate change, through the extraction or production of fossil fuels the manufacture of chemicals which are persistent in the environment and linked to long term health concerns the unsustainable harvest of natural resources, including timber and fish. Furthermore, the bank will seek to support companies involved in: recycling and sustainable waste management renewable energy and energy efficiency sustainable natural products and services, including timber and organic produce the pursuit of ecological sustainability.
- In 1994 the Co-operative Bank became the first UK bank to establish an in-house ecology unit, responsible for facilitating the development of financial products for environmental businesses and organisations. This ecology team has experience of working with companies of all sizes and varieties.

Financial impacts

Fundamentals

Profitability

In 2001, the bank calculated that 14% of its pre-tax profits came from customers who stated that 'ethics is the most important factor' in deciding to bank with the Co-operative Bank, while 26% came from those who said that 'ethics was an important factor' in choosing the bank. Environmental considerations do form part of the institution's ethical policy. In 2003, Chris Laszlo published a book, arguing that ethical business conduct increases shareholder value. He highlighted a number of companies that have turned good ethical conduct into tangible profits, particularly highlighting Co-operative Bank, whose strong social and environmental record directly contributed to 20% percent of company profits. In 2002 Co-operative Bank pre-tax profits were £122.5 million, up 14% on the previous year. This was the ninth year of record results. Average retail customer deposit and lending balances rose by 12% and 11% respectively. Return on equity (after tax) was 19.8%. Profits for 2003 have just been reported at £130 million, up over 6%.

Operating costs

Investment in new environmental policies, research, new business streams and clear reporting has not added any significant burdens to the company in terms of financial costs.

Intangibles

Corporate reputation

In Business in the Environment's (BiE) Seventh Index of Corporate Environmental Engagement, March 2003, the Co-operative Bank, joined an 'elite' group of organisations – the 'Premier League' – that scored over 95% in this assessment of their environmental management processes and impacts. 207 businesses participated in the seventh index. In 2002 it was awarded the 'Special Judges' Award for Overall Corporate Social Responsibility Performance' at the Global Corporate Conscience Awards in New York. The bank also won the ACCA sustainability reporting award for third year running. The bank was the outright winner for the second consecutive year, having shared the award in 2002 with BT and Shell.

Competitive advantage

During 2000 the Co-operative Bank's account base grew by 336,000 accounts and 280,000 customers, and continues to grow, largely due to the explicit ethical policy launched in 1992. Its position is cited to be a powerful differentiator that creates high levels of customer loyalty. Recent MORI surveys have found that the bank's current account holders cite 'ethics' more frequently than any other issue when questioned as to the factors that influenced them to open an account.

New markets

A wide range of tailored banking products is on offer, providing low-cost banking, interest on deposits and a variety of borrowing facilities at reduced rates. There are a number of products and services available from the ecology unit.

Stakeholder relations

The environmental policy has struck a chord with the bank's customers, finding high levels of support, likely to foster customer loyalty. Customer satisfaction rates with the bank's investment policy on various environmental issues are shown below:

No investment in business whose core activity contributes to:

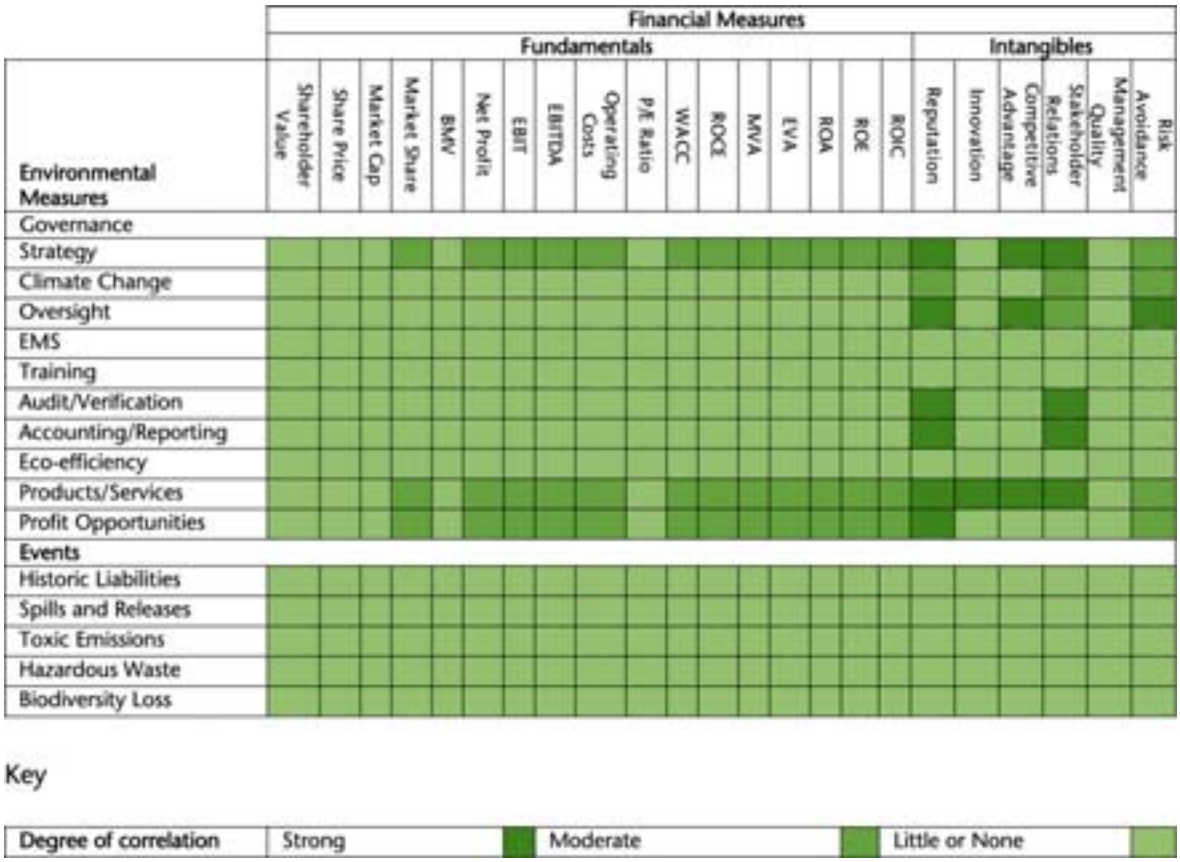
- global climate change - 70%
- persistent chemicals - 88%
- unsustainable harvesting - 94%

For positive investments:

- recycling and sustainable waste management - 98%
- renewable energy and energy efficiency - 98%
- sustainable natural products and services, including timber and organic produce - 97%
- the pursuit of ecological sustainability - 97%

So far as the bank's own employees are concerned, employee loyalty and motivation also seems to have been achieved through the environmental and ethical policy stance. In a survey, 'UK's Best Workplaces 2003', the bank ranked 24 out of 50. In March 2003 the bank was named by Great Place to Work as a 'Best Workplace 2003'. Inclusion in the list, published by the Financial Times, is influenced by an independent random survey of staff views about their employer.

Appendix – summary of financial impacts identified



Key

Degree of correlation	Strong	Moderate	Little or None

10. Company Case Study – Iceland (The Big Food Group Plc)

Own-brand product sales increased after decision in 1998 to ban GM ingredients, but environmentally-friendly foods strategy proved costly

Summary

The company

Formerly known as Iceland Group Plc, the Big Food Group is engaged in food retailing, wholesaling, and food service together with appliance retailing, repair and delivery. The group has over 3.4 million customers a week visiting Iceland Food stores, 100,000 corner shops/independent grocers and 370,000 catering outlets obtaining their supplies from Booker and Woodward. Well-known trading names are Iceland Foods, Iceland Home Shopping, Booker Cash & Carry and Woodward Food service. Wholesale accounted for 68% of fiscal 2003 revenues; retail, 30% and food service, 2%.

Background

Iceland took an innovative approach to issues such as GM ingredients and additives in its own brand goods. It introduced no-GM and no artificial colouring or flavourings policies in 1998 which appeared to deliver some initially positive results. Its organic produce strategy, selling organic foods at low cost, reportedly cost the company approximately £20 million (rather than the £8 million originally predicted). These higher than expected costs, on top of a run of poor sales in late 2000 resulted in a slump in the company's share price.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Iceland introduced a no-GM policy in 1998 for its own-brand goods, one of the first UK food retailers to do so.	Improved reputation.	Strong – widely praised for its public stance. Increased sales.	Sales of own-brand products appeared to increase after decision in 1998 to ban GM ingredients.
Announced its intention to eliminate artificial colours and flavourings preservatives from own brand goods in late 1998.	Improved reputation.	Strong – widely praised for its stance.	Share price rally at end of trading (increasing 3.3%) on day this was announced.
Announced intention to source only organic produce for its own brand goods but to sell them at 'non-organic' prices with the company absorbing the shortfall – predicted at £8 million.	Improved reputation at first followed by apparent loss in investor confidence when the initiative proved costly.	Strong – support at first, but investor reaction equally strong when company revealed the true cost of the operation and ended the initiative after 6 months.	Initial enthusiasm fell as company saw falling sales and mounting costs - estimated at £20m. Profit warning in 2000, share price fell 50% in Jan 2001.
Iceland was the first retailer to sell a 'Kyoto' range of fridges, the only such product endorsed by Greenpeace.	Competitive advantage through new markets and improved reputation.	Moderate – the UK's large appliance retailers now equally if not more proactive on these issues.	Sales figures for 'Kyoto' fridges not disclosed.

***N.B.** This case study looks only at Iceland, the food retail arm of the Big Food Group Plc. None of the other Big Food Group company subsidiaries are considered.

Environmental Governance

Issues

- Public and NGO pressure on issues such as GM ingredients and food additives has gained momentum in the last five years. The policies of major food retailers on these and other environmental issues have subsequently been in the spotlight and those failing to develop policies have been criticised.
- Receiving less public and media attention but still important for the sector is the waste production, energy and fuel consumption by retail outlets and distribution activities. Proactive retailers are addressing these concerns by improving transparency and reporting on policies, management systems and progress regarding these issues.

Responses

- Iceland was one of the first food retailers to adopt a public stance on GM ingredients, banning them in all of its own brand goods as far back as 1998.
- In 1998 the company also declared its intention to phase out artificial colours and flavourings (and preservatives where possible) from its own brand goods. Customers responded positively to both this move and the no-GM policy.
- Iceland's profile further improved in 1999 when it announced that all its own-brand food products would be sourced from organic producers, but sold at non-organic prices. In addition to this, Iceland pledged £1 million to the National Trust's 'Whole Farming Planning' program. This program had the aim of increasing the amount of UK farming land devoted to organic produce. The company announced that any shortfall in revenues as a result of this strategy would be absorbed – estimated at the time to be £8 million.
- Unfortunately for Iceland its organic strategy backfired and was abandoned after only six months, incurring costs (approximately £20 million) and contributing to a sustained drop in its share price.
- Iceland is also a major retailer of kitchen appliances, particularly fridges and freezers. In 1999 it launched the Iceland 'Kyoto' range of fridges and freezers, the first and only products in the world to be endorsed by Greenpeace. These fridges use non-CFC refrigerant gas isobutene. In addition, since October 1999 the company has a policy of purchasing commercial fridges and freezers that use isobutane as their refrigerant.
- Prior to 2004 Iceland was the only subsidiary of the Big Food Group to report on environmental issues. However, in 2003/04 the Group developed a CSR strategy including policies regarding its environmental commitments, and included the incorporation of recommendations from the ABI guidelines into its risk management systems. All CSR governance is coordinated by the CSR Management Forum, which reports to the board level CSR Committee, which in turn is accountable to the main board. A group-wide third party environmental audit was conducted as part of the development of the Group's CSR strategy. A formal EMS is also under development, projected to be rolled out in 2004/05. Reporting on environmental governance is currently included in a brief section in the Big Food Group annual report with more detail provided on the corporate website. From 2005 reporting will be expanded to include details on performance and KPIs based on the major elements of its CSR strategy.

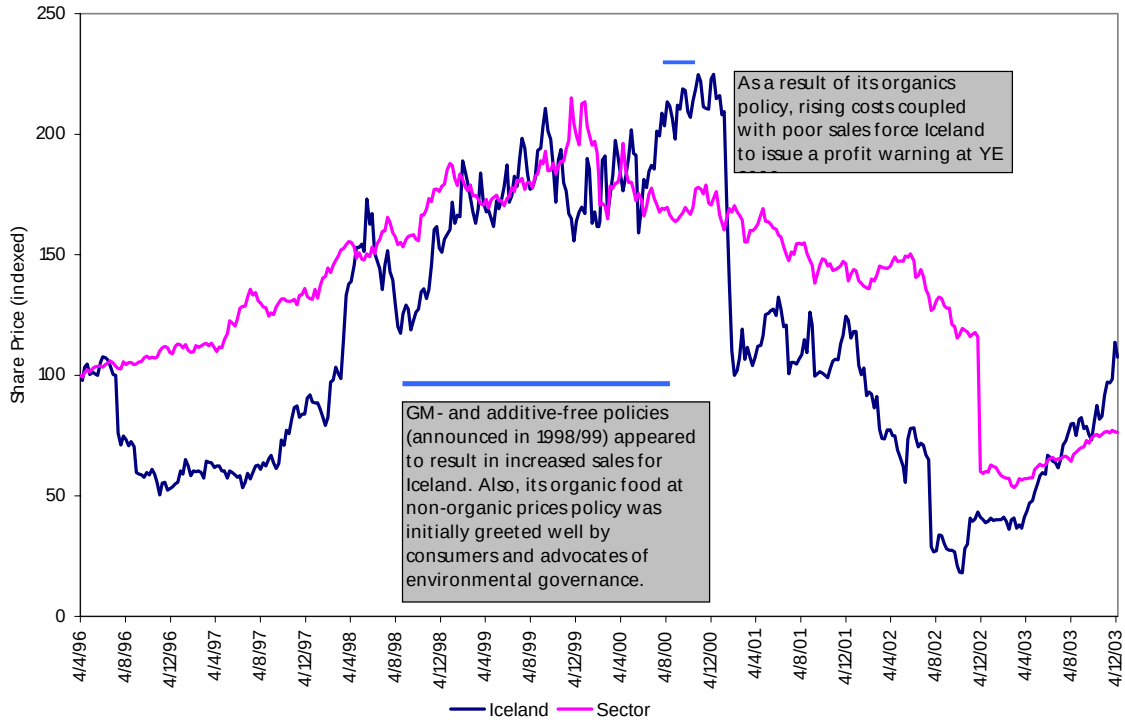
Financial impacts

Fundamentals

Share price performance

Figure 17

Iceland (Big Food Group) Share Price (indexed) vs World DS Food & Drug Retailers (indexed)



N.B. Iceland's financial data is consolidated within the Big Food Group's accounts. Iceland's revenues make up only 30% of overall revenues at the Big Food Group. Drawing firm conclusions from financial data is therefore difficult but the impact of Iceland's organics policy appears to have been a contributing factor to the decline in the group's share price in early 2001.

Iceland's fortunes have been mixed over the last five years. The company saw sales of its own-brand products increase after the decision in 1998 to ban GM ingredients. However, this cannot be taken in isolation from ongoing price promotions – a major driver of Iceland's sales. Also, the company's share price seemed to rally (increasing 3.3%) at the end of trading on the day that the company announced its intention to eliminate artificial colours and flavourings from its own brand goods, in the same year.

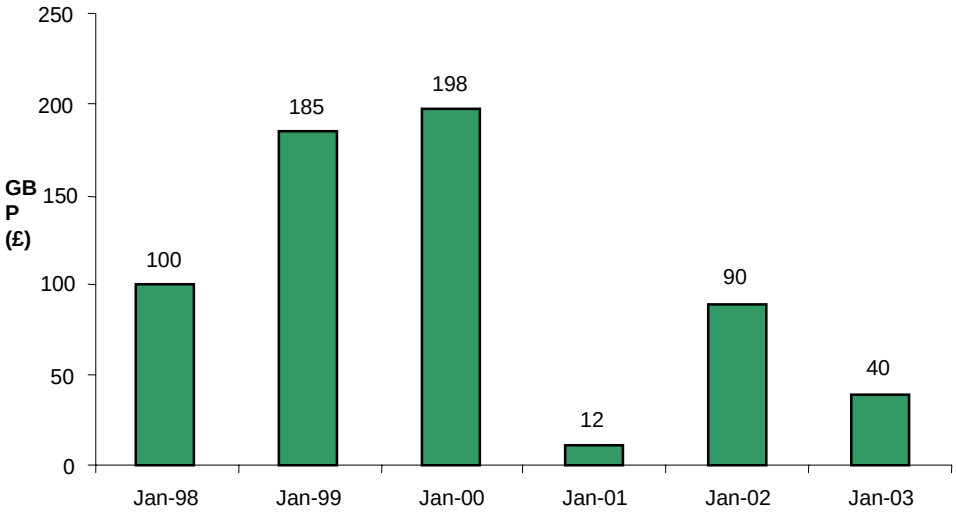
The decision, in 1999, to provide organic produce at 'non-organic' prices (and promote organic farming through the support of a UK organic farming initiative and a donation of £1 million) was greeted with enthusiasm and praise by environmental groups and organic farmers. Initially, it was predicted that the company would have to absorb additional costs of around £8 million so that Iceland's own brand (organic) goods were competitively priced against non-organic alternatives.

However, in late 2000 Iceland's fortunes changed. The company experienced generally poor sales - a 1.5% drop in sales in the second half of 2000, and a 5.5% decline in the month leading up to Christmas 2000 – as a result of unsuccessful price promotions. The effect of this was exacerbated by the higher than expected costs of Iceland's organic foods strategy – the final costs of which were nearer to £20 million than the estimated £8 million. This news, received as a profit warning by the city, saw the company's share price drop in early 2001. At year end 2000, Iceland's share price was 322p. By mid-Feb 2001 it had fallen to 153p.

Total Shareholder Return (TSR)

A brief assessment of Iceland's total shareholder return (TSR) over the last five years gives a good picture of Iceland's changing fortunes, of which the organics strategy was a contributing factor.

Figure 18
Total Shareholder Return 1998 – 2003



Source: Big Food Group

TSR showed strong growth from 1998 to 2000, the period over which Iceland announced its GM- and additive-free policies and then introduced its organic produce policy. As a result of the company's profit warning in late 2000, TSR declined almost to zero in 2001.

Intangibles

Corporate reputation

Green groups lauded Iceland as a key proponent of sound environmental management and 'green' business, as a result of its stance on GM ingredients, food additives and organics.

Competitive advantage and new markets

Iceland has been selling fridges and other kitchen appliances for a number of years. In fact, it is one of the UK's major fridge/freezer retailers. The company won plaudits from supporters of environmental governance when, in October 1998, it began stocking a refrigerator endorsed by Greenpeace due to its lack of ozone depletion chemicals in the condensing unit. This is the only such product that Greenpeace endorses.

If Iceland decides to reintroduce organic produce in the future it will face a challenge in gaining market share away from the other major food retailers (such as Sainsbury and Tesco). Tesco is currently the largest organic retailer in the UK with 28% of the market.

According to the UK's Soil Association, the UK organics market is worth over £1 billion and is growing at over 10% a year – faster than that for any other food and drink products. The Iceland strategy on 'environmentally-friendly' foods may have been ahead of its time, during a period when customers were not entirely ready to opt for such foods or sufficiently aware of them.

Operational efficiency

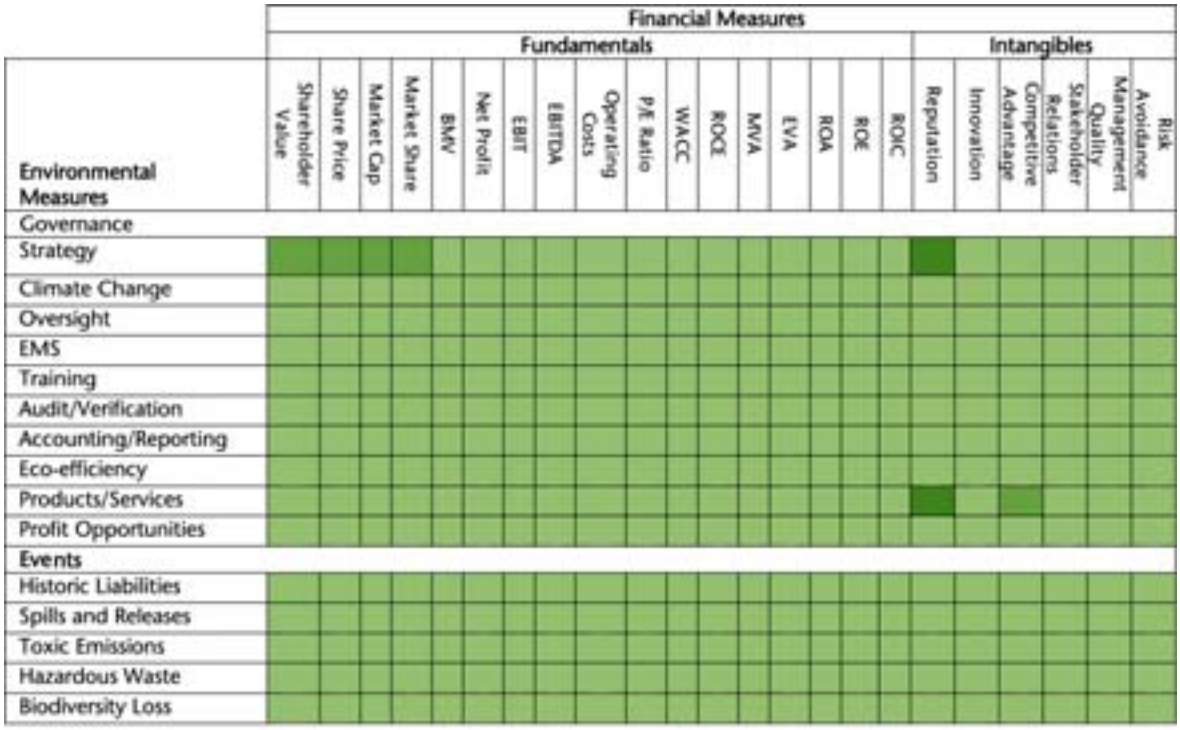
Retailers can improve operational efficiency, reduce costs and increase profitability by focusing on energy use, logistics and waste management. The typically low profit margin associated with the food and drug retail sector (often in the 2-3% range) means that reducing energy costs can significantly increase profitability. The cost of energy for large retail chains is between 15-20% of total operating costs.

The US EPA (environmental protection agency) estimates that, on average, reducing energy costs by US$1 has the same impact on profitability as increasing off-the-shelf sales by US$85. Improving energy management usually enhances lighting, refrigeration and HVAC (heating, ventilating and air conditioning) performance. This leads to less food spoilage and can reduce lost work time related to illness resulting from inefficient heating or cooling. Also, by increasing operating efficiency, companies are able to lower costs, reduce waste and redirect revenue to other areas of the business, for example expansion and competitive pricing.

In terms of logistics, proactive companies are using innovative logistics management systems to reduce overall number of journeys, improve driver efficiency and thereby reduce fuel consumption and greenhouse gas (GHG) emissions.

According to research conducted by the UK government, proactive waste reduction measures can reduce costs by 1% or more, the equivalent of increasing sales by 10-20% in this low margin business. Waste reduction measures include implementing sophisticated waste sorting and recycling programs, redesigning packaging and encouraging consumers to recycle their own waste.

Appendix – summary of financial impacts identified



Key

Degree of correlation	Strong	Moderate	Little or None

11. Company Case Study – Monsanto

Long-running lawsuit recently settled for US$396m. Scale of fines over past decade likely to have had an impact on operating costs and profitability.

Summary

The Company

Monsanto was merged into Pharmacia & Upjohn Inc. in March 2000, which spun off a new incarnation of Monsanto as an independent company in 2002. It now specialises in genetic engineering of seeds, herbicides and pesticides. Bio-engineered products are sold to the agricultural industry. Net sales were US$4,936m for fiscal year 2003. Sales are split between the Agricultural Productivity and Seeds & Genomics divisions in a 60:40 ratio, respectively. Sales are derived mainly from markets in the US, Canada, Mexico, Argentina, Brazil and France. Monsanto's main product, Roundup, is the world's most popular herbicide. Worldwide, employees number 14,700.

Background

Monsanto has revised its strategy on environmental issues and stakeholder consultation. Prior to the merger with Pharmacia, in the early 1990s, new company directors had reversed the previous board's decision to take a circumspect approach to the introduction of agricultural biotechnology products until farmers, food retailers and the general public had accepted the technology. However, in Europe there has been and continues to be some resistance to the introduction of GE crops. Monsanto is now reviving its outside consultations with environmental, consumer and other groups with concerns or interest in GE technology, but the company announced in October 2003 that it is withdrawing from many European operations. The relatively strong anti-GE stance of many European consumers continues to be a taxing issue for the international biotechnology business.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
The environmental governance strategy of the 1990s appeared not to take full account of differing perceptions about GE foods in different regions, with concerns in Europe over human health and environmental damage affecting the speed at which GE crops could be introduced	Lost revenues particularly in the EU and possible damage to stock-price performance	Strong – Pharmacia decided to spin off Monsanto, in part due to the uncertain future of the agri-biotech market	Reductions in EU imports of GE crops. US corn exports to Europe fell from US$305m in 1996 to US$2m in 2001. Exports to Korea have fallen from US$300m to US$85m
Environmental management of hazardous and toxic wastes from previous chemicals operations in the US led to historic liabilities for 28 Superfund sites; ranked 5th on the TRI for releases to land, air and water	Impact on operating costs, stock-price	Strong - fines likely to have affected operating costs and earnings per share	Long-running lawsuit recently settled for US$396m on Monsanto's part, Solutia, previously owned by the former Monsanto, paid up to US$200m in remediation costs and has filed for bankruptcy protection
More responsive strategy with new focus on animal-feed crops and different forms of herbicides and insecticides; research into 'bio-pharming' on hold. Retrenching in European operations, partly due to reduced efficacy and greater competition	Revenue and stock price performance	Strong – revenues and stock-price performance increasing again during 2003	Will be fully measurable in the next financial year (decreases in Roundup sales accounted for 26% of the company's US$1,693m US losses in 2002)

Environmental Governance

Issues

- Public opposition in the EU has to an extent stymied efforts to market and sell GE crops in Europe and has curtailed sales or the donations of 'aid' to some developing countries with strong links and reliance on European trade and investment. Monsanto states that its US clients are few, large, and wholesale, and the company's strategy will be to sell more to its existing customers. But increasingly, the company's significant markets are developing for organically-grown and certified non-GE crops.
- Over 35 countries have enacted or announced laws that restrict GE imports and/or require labelling of foods containing GE ingredients. Europe was one of the first regions to restrict GE imports and require labelling. More recently, major food importers such as China, Japan and Korea have enacted GE restriction/labelling requirements. GE concerns have caused US corn exports to Europe to fall from US$305 million in 1996 to US$2 million in 2001. Exports to Korea have fallen from US$300 million to US$85 million. The Cartagena Protocol on Biosafety is likely to enter into force in 2004. This will impose substantially greater documentation and risk assessment costs on GE exporters. The Protocol will also likely hold GE seed manufacturers liable for contamination and other problems caused by GE seed use.
- Most European food manufacturers and retailers have implemented policies to ensure that no GE ingredients are used in their food products. Companies pursuing such policies include Nestlé, Unilever, Heinz, ASDA (Wal-Mart), Carrefour, Tesco and many others. Beyond Europe, there has been some strong opposition to GE crops in Asia, Africa and other developing regions.
- In 2002, Monsanto admitted that the "genetic drift" of GE traits to non-GE crops is inevitable. The company is abandoning efforts to produce pharmaceuticals in genetically engineered crops, 'pharming', to focus on businesses that could pay off sooner. The company has said that its decision was not related to the concerns that pharmaceutical-containing corn might wind up in food products, forcing product recalls, but was part of the broader overhaul of its strategy.
- With a 2002 loss of US$1.7 billion on sales of US$4.7 billion, several factors will place ongoing pressure on earnings. These include increasing competition for Roundup following patent expiration, growing resistance amongst the weeds Roundup is designed to control, difficulty in opening new markets due to concerns about GE safety, and questions about the economics of using GE products. A 2002 study by the US Department of Agriculture found that GE soya provided no net benefit to farmers in several cases. It also found that benefits from GE corn may have been due to seed companies setting low prices to gain market share.
- In 1995, the former Monsanto ranked fifth among US corporations in the EPA's Toxic Release Inventory, having discharged 37 million pounds of toxic chemicals into the air, land, water and underground. As of 2001, the current company has 29 agricultural-related Superfund sites where the US EPA has identified it as a 'potential responsible party'.
- PCBs and dioxin contamination over decades in the US, in sites surrounding manufacturing plants, waste disposal sites and other sources related to reuse of contaminated substances, led to class action lawsuits against the former Monsanto, the current company recently settling the liabilities linked to the spin-off company Solutia for US$396 million.

Responses

- Monsanto's new environmental pledge outlines its commitment to "Dialogue, Transparency, Respect, Sharing and Benefits". Monsanto is also revamping its image through increased stakeholder engagement and community involvement, reporting on its activities in a CSR report.
- The company has implemented an EMS and other environmental initiatives include the development of more recyclable product packaging and the installation of a co-generation plant at its facilities in Belgium. The company measures and reports its climate change emissions. There is a board committee on Public Policy and Corporate Responsibility, and two expert and industry advisory panels. Monsanto's environmental reporting methodology was developed in partnership with the WBCSD, represents an 11 year period depicting performance and product safety data, and is available online. Corporate audits are regularly conducted at major facilities.

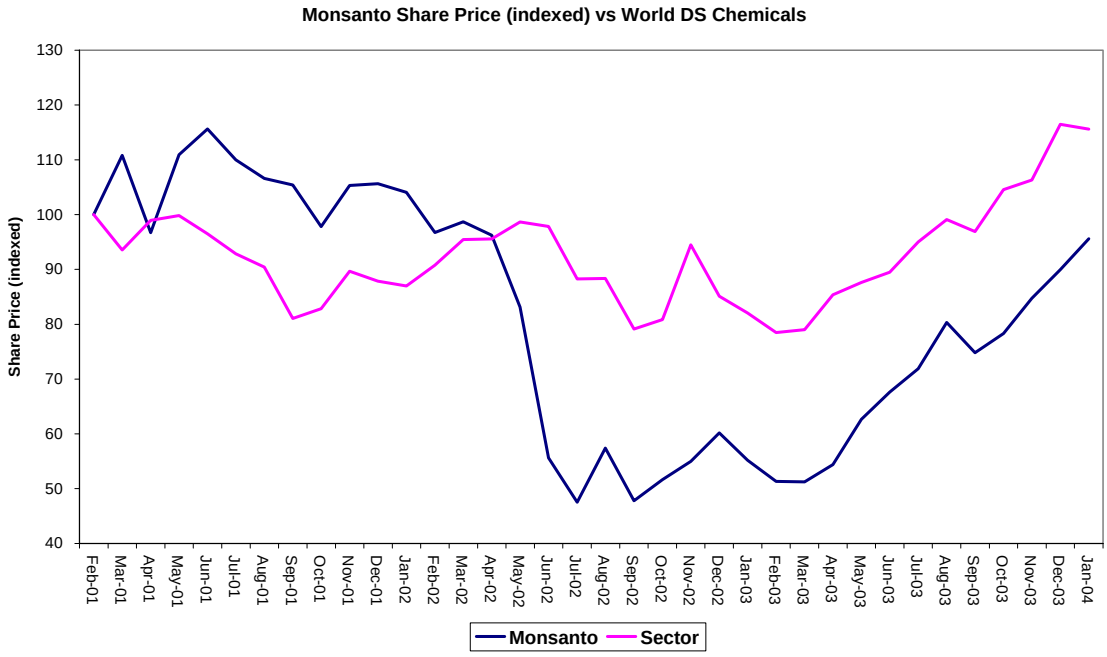
- The company claims that its farming technologies and products reduce the need for fossil fuel energy and contribute to reduced global greenhouse gas emissions as well as enabling more abundant and lower-impact agriculture in developing nations. However, many of these claims have been called into question by stakeholder groups and independent scientific evidence often appears to be at odds with Monsanto's own trials and findings on the continued success and superiority to traditional methods of its herbicides and modified crops.

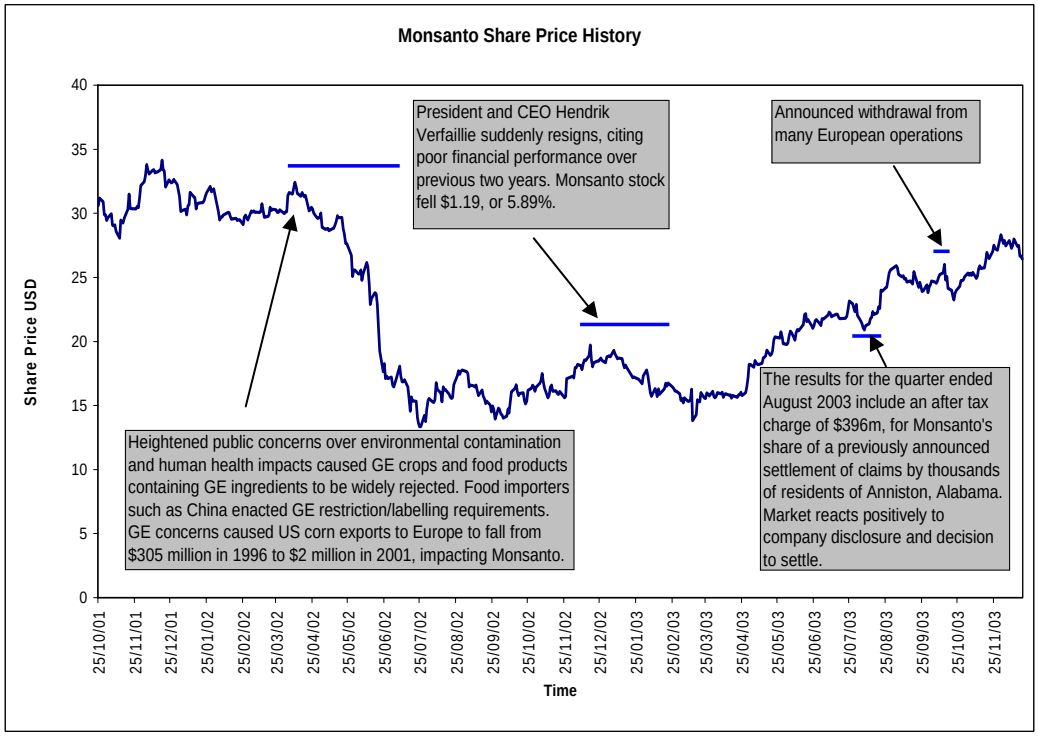
Financial impacts

Fundamentals

Share price performance

Figure 19





Monsanto's historic liabilities, consumer concerns over GE products, difficulties in ensuring good stakeholder relations and the continuing need for scientific testing to reassure the public have all been factors in its stock-price falls, reductions in earnings per share and increased operating costs.

In December 2002, the Monsanto president and chief executive Hendrik A. Verfaillie resigned, citing the company's poor financial performance over the previous two years. Monsanto stock fell US$1.19, or 5.89%. The company's share-price is now recovering from its slump in tandem with the company having adopted a more responsive environmental strategy.

Fines and liabilities

Results for the quarter ended August 2003 included an after tax charge of US$396m, or 96 cents per share, for Monsanto's share of a previously announced settlement of claims by thousands of residents of Anniston, Alabama. They alleged that a plant operated by Monsanto's former chemicals unit, Solutia Inc., contaminated their surroundings with PCBs (polychlorinated biphenyls).

In 1990, the former Monsanto company reached a US$648,000 settlement for allegedly failing to report required health data to the EPA. In 1991, it paid a US$1 million fine to the state Attorney General of Massachusetts in the case of a 200,000 gallon acid wastewater spill. A US$39 million settlement in Houston, Texas in 1992 involved the deposition of hazardous chemicals into unlined pits.

In 1997, the former Monsanto responded to five years of complaints by the New York State Attorney General that its advertisements for Roundup were misleading; the company altered its ads to delete claims that the herbicide is "biodegradable" and "environmentally friendly," and paid £31,000 toward the state's legal expenses in the case.

In March 1998, the company agreed to pay a fine of £136,000 for mislabeling containers of Roundup on 75 separate occasions with faulty safety information. The penalty was the largest settlement ever paid for violation of the Worker Protection Standards of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

The current Monsanto Company now has 29 Superfund sites, not including those incurred by Solutia or Pharmacia Corporation.

On 17 October 2003, the USDA disclosed that the former Monsanto and its research partners paid £38,000 in fines for previously undisclosed violations in 2001 in testing GE crops. The fines, though small for a multibillion-dollar company, were far higher than any previously known to have been levied against the company in similar circumstances. The violations had apparently been detected internally and reported to the government along standard lines, as part of an auditing program designed to ensure that unapproved crops do not reach food manufacturers or agricultural commodities.

Intangibles

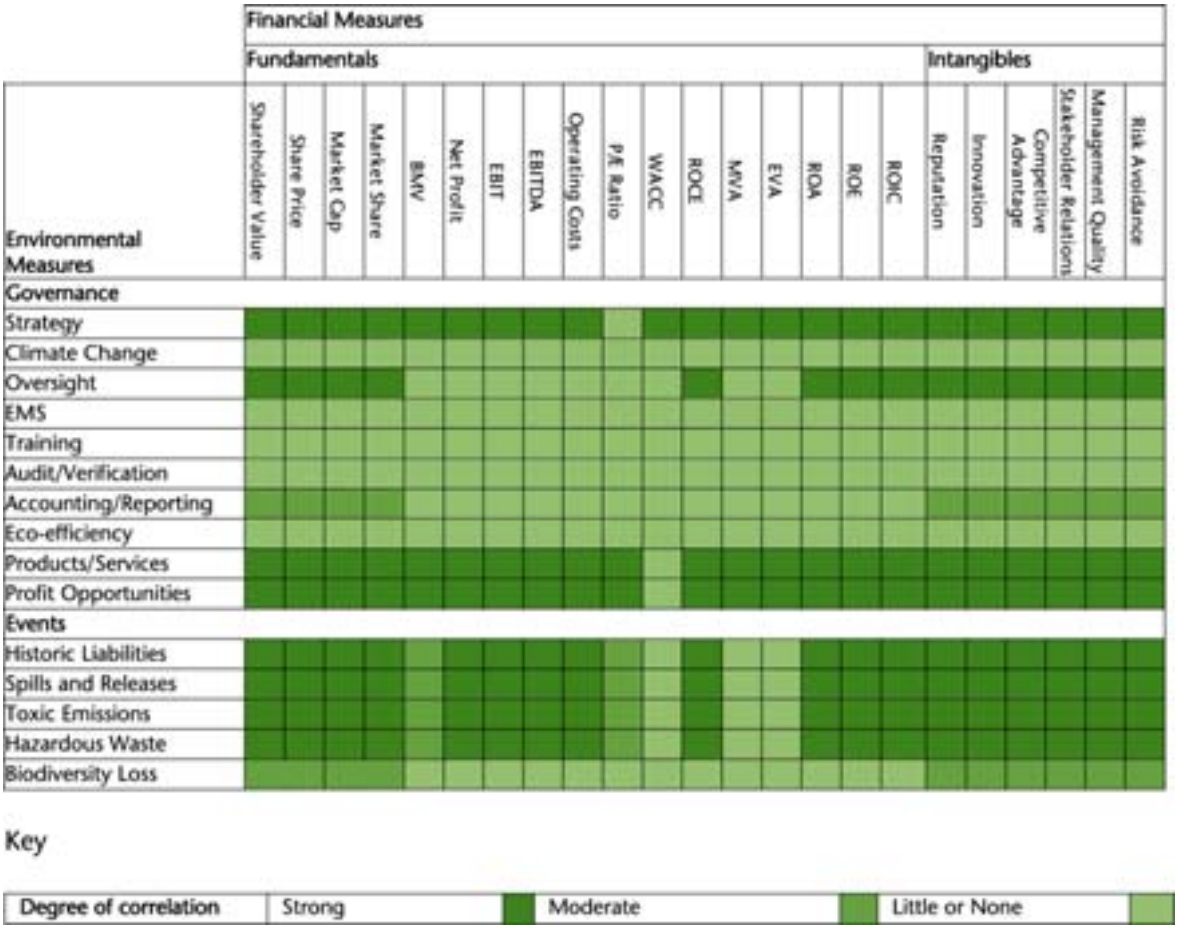
Competitive advantage

In order to achieve competitive advantage over traditional or organically-grown crops, the company has to demonstrate not only that its products are safe but also that they provide additional benefits to farmers, food manufacturers and retailers and to consumers. Adequate separation throughout the transportation of grain is also likely to be required soon which may be extremely difficult, given the systems currently in place where the grain from many different farms is stored in centralised silos before shipment. The argument often used previously has been that genetic engineering can result in reduced pesticide and herbicide applications, higher yields and enhanced properties of the crops, e.g., with added vitamins or minerals useful in developing countries where there may be widespread problems with malnutrition. The veracity of these claims is now being challenged as farmers often find that yields are not in fact greater than traditional varieties nor that they are necessarily using less herbicide. The company also cannot demonstrate that genetic drift and contamination of a farmer's other crops will not occur; recent evidence in fact shows that this is highly likely, representing further legal issues for the company.

New markets

Monsanto is now focusing on increasing sales to existing customers, particularly in the US, as the large markets envisaged in Europe and elsewhere in the world are not opening as expected, due to a relatively negative consumer response in some markets. The company is also working on new products not destined for human consumption, e.g. animal feed crops.

Appendix – summary of financial impacts identified



12. Company Case Study – PSA Peugeot Citroen

PSA's share price increased 250% in 5 years while sector average stagnated, thanks notably to a strong focus on highly efficient diesel vehicles.

Summary

The Company

PSA Peugeot Citroen (PSA) is France's leading car manufacturer and Europe's second largest with a 15.4% market share. Present in more than 140 countries, PSA has a worldwide scope and has a 5.8% global market share. As a company in an environmentally sensitive industry such as the automobile sector, PSA has developed a proactive environmental policy, focused on addressing global warming and urban quality of life as well as sustainable mobility. Innovation and an advanced life cycle approach have helped to limit market risk and have offered profit opportunities that appear to have contributed steadily to PSA's market strength.

Background

PSA's environmental strategy consists of attaining sustainable growth with products that are fuel efficient and notably through the increase of its market in diesel passenger cars. While this strategy currently offers a practical step forward in terms of addressing global warming, PSA is also developing alternative technologies to provide advanced models to the market when it is ready to adopt them. For approximately 20 years, Peugeot has strived to reduce fuel consumption of its vehicles. Moreover, PSA's main innovations have been linked to addressing environmental concerns. The company has launched several leading technologies to reduce tail-pipe pollutant emissions, especially for diesel motors. This strategy has proved highly successful in a European market fiscally favorable to diesel as a whole, and where diesel has a 43.5% market share. Since 1996 when the company committed to lowering carbon dioxide emissions, each year has seen an additional step towards more environmentally-friendly vehicles and facilities.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Focus on low emission product development	Competitive advantage; through new markets	Strong - likely to have contributed to a strong regional and international market presence	Increased market share by 170 basis points in 2000, partly thanks to the development of 'common rail' diesel engine
Implementation and development of an environmental management strategy	Improved reputation	Moderate – improvements in most eco-efficiency indicators	COV emissions dropped 50% from 1988 and 39% water reduction since 1995 per vehicle produced
Investment in 'sustainable' business opportunities	Increased turnover and profits	Strong - significant and growing return	PSA's 2002 profit increased nearly 30%, share price increased 250% in 5 years, partly because it led introduction of diesel vehicles into the market

Environmental Governance

Issues

- The growth rate of the world fleet is about twice the rate of population growth and traffic is a source of major environmental and health impacts.
- The environmental impact of a motor vehicle in use is 5 to 10 times greater than the impact linked to the manufacture of the vehicle. This indicates that the market risk posed by environmental issues is far greater than the operating risks of manufacturing activities.
- Plant operating costs, energy and water consumption for example, represent significant overheads for automotive manufacturers.
- In most OECD countries, legislators have set up regulations to stimulate further improvements from the 75% average rate in the recyclability of vehicles. The EU directive mandates auto manufacturers to make vehicles that are 85% reusable by 2006 and 95% by 2015.
- The major environmental impact in this industry is linked to tailpipe exhaust emissions: smog-forming emissions (NOx, CO, HC, particulates) and contribution to global warming (CO2). Thanks to increasingly severe tailpipe emissions regulations or voluntary agreements the problem of smog-forming has been reduced, yet not sufficiently to eliminate adverse public health effects in large population centres. In addition, the creation of emissions linked to global warming is the most challenging issue for companies and investors. A fleet fuel economy differential is a direct measure of the corporation's market risk exposure. Fluctuation in fuel prices and any carbon emissions regulations that will eventually result from coordinated efforts to combat greenhouse gasses might impact the automaker.

Responses

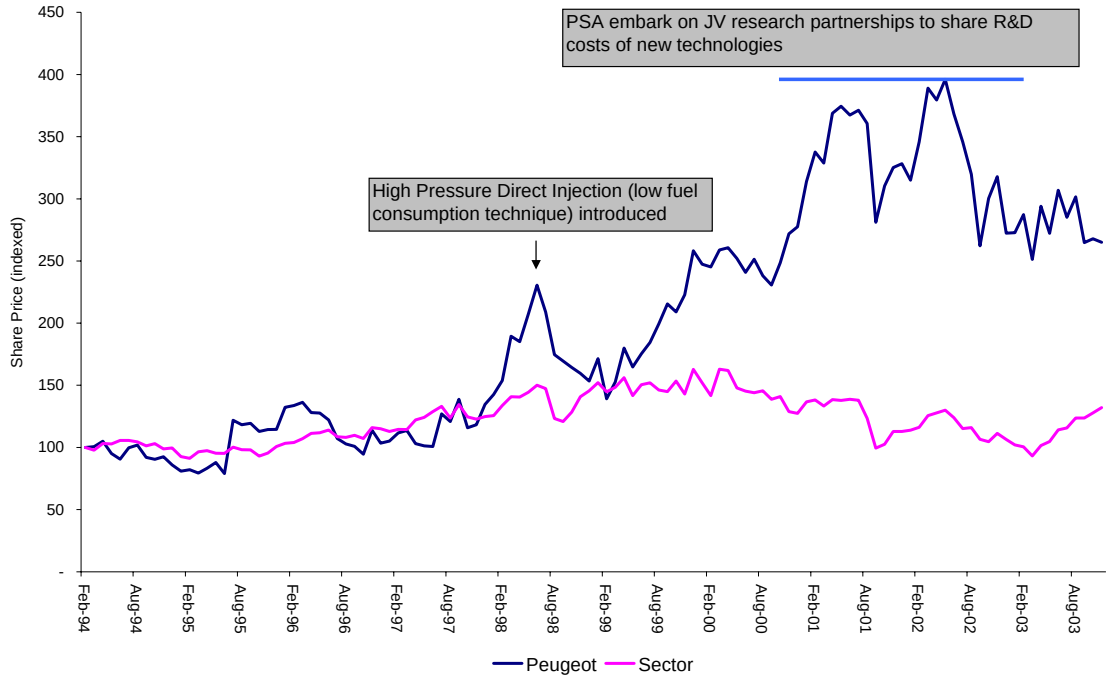
- The group has developed action plans to reduce energy and water consumption at all its automobile plants. Through the use of metering systems and the least water-intensive operating parameters, water consumption was reduced by 5% between 1995 and 2002 despite a 65% increase in production.
- PSA has set up very strong goals and has achieved a recyclability rate target of 95% for the most recent models, which is beyond the current EU directive.
- Diesel car reputation has been completely revitalised in the European Union and PSA has benefited from sustainable growth by increasing its offer and therefore its market share in diesel passenger cars, becoming world's leader in eco-efficient diesel engines. Diesel appears to be currently the most practical solution to global warming. Indeed, diesel engines deliver equivalent performance, yet use less fuel and therefore emit less CO2 than petrol engines, all while reducing other emissions thanks to the development of the two flagship technologies of PSA; the High-pressure Direct Injection (HDI) engine, a 'common rail' system curbing the emissions up to 25% with respect to a conventional diesel motor and the particulate-filter system which cuts particle emissions below measurable limits, according to Peugeot.
- PSA has been involved in the development of electric cars for many years. As early as 1996, PSA launched the Saxo Electric. So far, the group has sold 9,000 electric cars.
- Fuel cell vehicles are considered as the "next big thing" in the car industry and PSA has been involved in the European Hydro-Gen Program and in numerous agreements with the EU and the French government to develop fuel cell technology. From this research the Peugeot Partner Taxi Pac prototype has emerged.

Financial impacts

Fundamentals

Share price performance

Figure 20
Peugeot Share Price (indexed) v World DS Automobile



Share price grew in a noticeable way during two recent periods, when PSA stock outperformed the global market. These periods coincided with several environmental events and PSA's response to them:

- In 1998, public authorities implemented incentives to promote the purchase of new, rather than old, second hand vehicles. This has had a positive effect on the sales of low fuel mileage cars in Europe, especially in Italy. As an indirect impact, these moves to boost sales of fuel efficient cars benefited producers specialising in small cars and those that were using specific technologies to reduce fuel emission, such as PSA.
- In the same year, PSA launched High-pressure Direct Injection, known as HDI, which reduces fuel consumption, thanks to an advanced fuel injection system in the engine.
- From 1999 to 2003, diesel car sales grew sharply in Europe. In 2003, such cars accounted for 67.4% of the total cars sales in France and the rate in Britain exceeded 25% whilst in Germany it reached almost 40%. In the meantime, PSA's automobile sales increased by 33%, in part because it led the pack in introducing diesel vehicles into the market.
- In this period, PSA also implemented joint-venture research partnerships, notably with US manufacturer Ford to share technological research development costs and with Japanese manufacturer Toyota that share the conception and the production of an entire vehicle in common. These partnerships help the automaker to be better prepared to face tough regulation on fleet fuel emissions in 2005.

Intangibles

Corporate reputation

Thanks to a winning product strategy and proactive R&D programmes that have enabled PSA to make significant improvements in its fleet fuel efficiency, PSA has successfully promoted its brand and its corporate image. Technological innovations helped PSA to reach a continuous market share benefit, by offering consumers automobile evolution at prices they can economically afford.

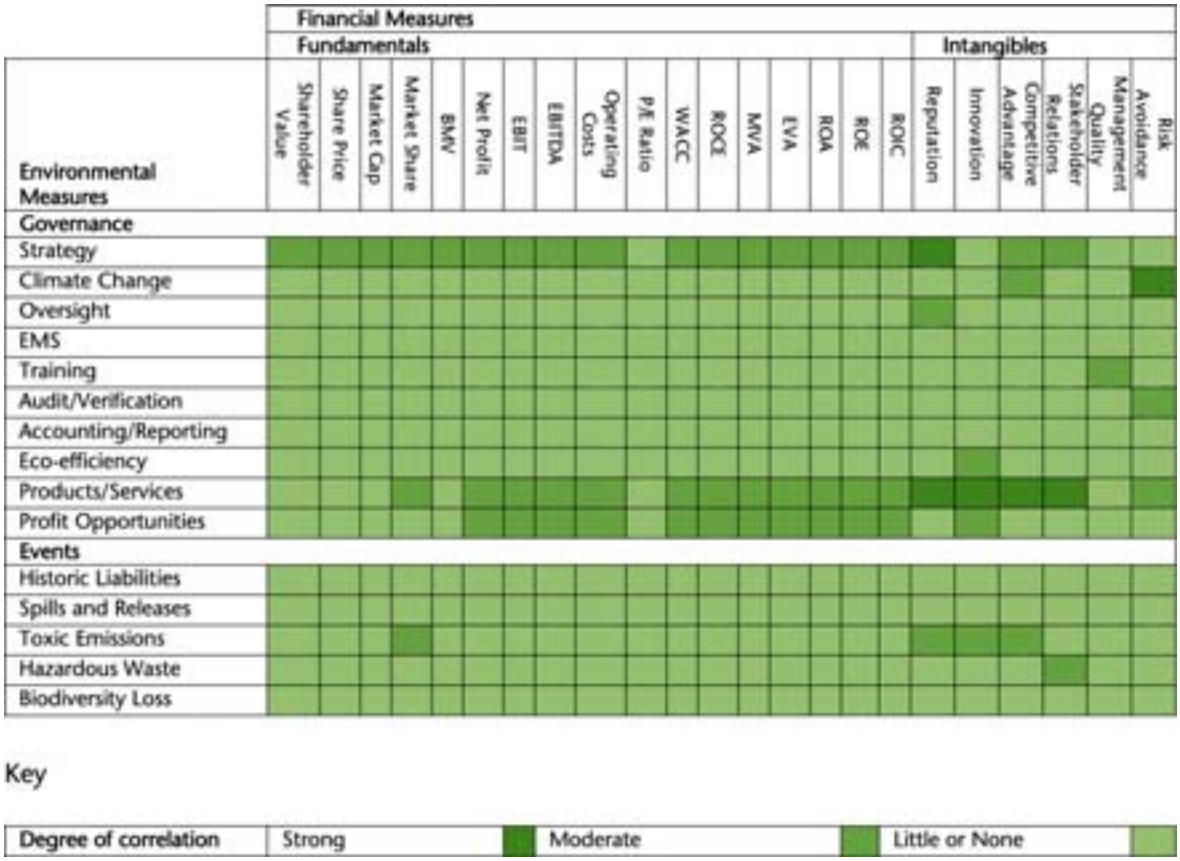
It is worth noting several environmental technologies developed in recent years:

Most of the air conditioning systems use fluorinated gases, which have an adverse impact on the stratospheric ozone layer. They will ultimately be banned. In partnership with auto component manufacturer Delphi, PSA has addressed these environmental impacts by replacing the HFC coolant gas used today with carbon dioxide. CO2 does not harm the ozone layer and its contribution to the greenhouse effect is half that of HFCs.
The latest generation of 'common rail' HDI engines reduces CO2 emissions by 20% compared with an indirect-injection diesel system and by 40% compared with a gasoline engine.
Another link in the emissions control chain is the particle filter that has further enhanced the environmental performance of diesel engines. PSA is the only carmaker in the world to offer particle filter technology as a standard feature, in a demonstration of its commitment to improving the quality of air in urban environments.

Competitive advantage and new markets

In 2003, while most European carmakers declared they will be unlikely to meet the ACEA voluntary target to cut CO2 emissions over the next decade, PSA is considered as the only European carmaker that would effectively meet the 2008 target. This individual performance is the result of efforts within PSA's sustainable policy to meet environmental requirements and might offer the automaker a profile ahead of that of its competitors. This key factor is seen as a competitive advantage that might impact sales favourably. PSA also meets consumer demand by offering cars that respond to fuel consumption reduction challenges, important considering the high price of fuel in Europe.

Appendix – summary of financial impacts identified



13. Company Case Study – Shell

Environmental management strategy in Nigeria helped SPDC produce five-year high of 1 million barrels crude oil per day. Shell Solar has achieved global market share of more than 10% in solar photovoltaics (end 2003)

Summary

The Company

Shell is a global group of energy and petrochemicals companies, operating in over 145 countries and employing more than 118,000 people. In the first half of the 1990s Shell became the target of a number of investor, consumer and campaign groups, concerned about the company's record on the environment. Since then Shell has developed a new approach to the environment and now states that its aim 'is to meet the energy needs of society, in ways that are economically, socially and environmentally viable, now and in the future'

Background

Shell adopted a new approach to environmental governance following criticism of its environmental performance in the mid-1990s – particularly in relation to activities in the Niger Delta and disposal of the Brent Spar oil platform. In the autumn of 1996, Shell's committee of managing directors (CMD) included in the Group Business Principles and the Group HSE Policy a commitment to sustainable development. This commitment was rolled out across the Group in March of 2003

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Perceived lack of comprehensive environmental strategy led to unforeseen public reaction to planned disposal of Brent Spar and pressure to find a more environmental solution	Cost of dismantling Brent Spar	Strong – evidence that additional costs incurred	US$60 - 80m – minimal in context of Shell operating costs. 6 month loss of retail market share in selected European countries. No discernible impact on share price. Financial effects of reputation impact, particularly on staff, not quantified
Perceived weaknesses in environmental policy, strategy and reporting in mid-1990s brought challenges in terms of corporate image, not just Brent Spar issue but situation regarding Nigerian operations	Possible damage to good reputation	Strong – CMD responds with a strong commitment to Sustainable Development	No estimate has been made by the company or other analysts in terms of any reputation damage
Implementation and development of sustainability strategy in the last six years, particular focus on Nigerian operations. Shell Group Business Principles and Sustainable Development Road Map. Each system accentuates importance of mid- to long-term planning and integration of social and environmental factors in bi-directional management. Social Responsibility Committee established in 1997 reviews sustainability policy and conduct.	Improved reputation; improved operational efficiencies	Strong – inclusion in leading ethical indexes and production increase	As well as being included in the DJSI, Shell is also a constituent company of the FTSE4GOOD index. In October 2003 SPDC produced a five-year high of 1 million barrels of crude oil per day
Investment in renewable energy companies and technology. In 1997, commitment to invest US$500 million over five years to significantly increase renewable business area. Created another core business called "Shell Renewables".	Competitive advantage through new markets	Strong - significant investment in 'green' businesses and development of market share	Shell Solar has a global market share of more than 10% in solar photovoltaics

Environmental governance

Issues

- Adverse NGO, media and consumer reactions to the oil industry in general, following incidents such as Exxon Valdez and growing international concerns about climate change.
- Serious pollution incidents and associated fines in the early 1990s, eg discharge to Mersey River 1990 and largest UK fine levied at the time (150 tonnes of high-viscosity crude oil escaped into the Mersey Estuary, over a period of little more than an hour, from a fracture in a pipeline operated by Shell UK).
- Disposal of Brent Spar oil platform and public debates and NGO actions, 1995 – 1998
- Shareholder resolution lodged in 1997 on environmental and social policies.
- Environmental pollution in Niger Delta/Ogoniland and related human rights issues, including media and investor attention following execution in 1995 of environmental campaigner Ken Saro Wiwa (and subsequent case being brought under Alien Tort Claims Act) and eight other rights activists belonging to the Ogoni minority on murder charges.
- Accusations of 'Greenwash', received Greenwash award from pressure groups at World Summit on Sustainable Development in 2002.
- Strategy to increase oil extraction during period 2000 – 2005.

Responses

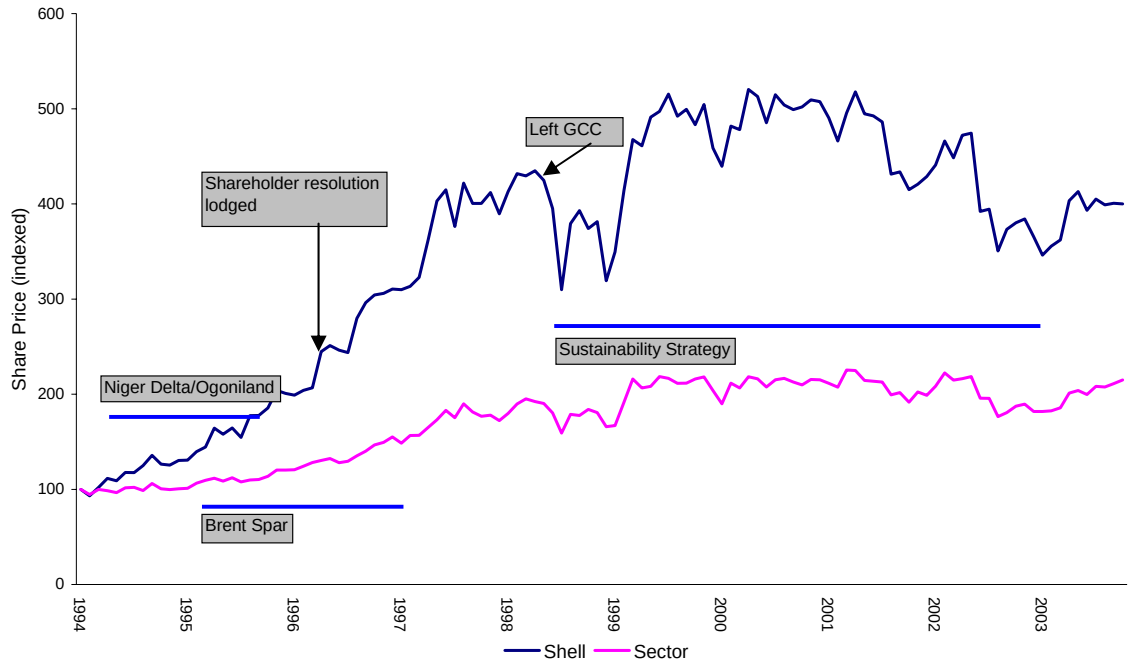
- Publication of the 'Shell Report', now in its sixth year – this entailed a new commitment to sustainable development, creation of a sustainable development management framework and more transparent reporting, including in-depth coverage of environmental and social issues in Nigeria.
- Downward trend in emissions of methane, HCFC, CFCs, volatile organic compounds, sulphur dioxide, oil in effluent, oil spills, energy efficiency.
- Greenhouse gas emissions have been kept flat even with an increase in activity. Shell expects to meet their 2010 target (5% lower emissions than 1990) as energy efficiency programs and projects to end gas flaring compensate for business growth.
- Commitment to stop all continuous 'gas flaring' in all operations by 2008, phase out of all continuous gas venting now completed (last unit, in Brunei.
- Significant investment in marketing and PR to improve environmental image, including stakeholder dialogue and 'Tell Shell' initiative.
- Left Global Climate Coalition (GCC) in 1998.
- Continuing investment in renewable energy operations.
- Reductions in local pollution incidents.
- Withdrawal from a number of potentially controversial projects/concessions, eg Ogoniland, Chad-Cameroon pipeline, joint ventures in Peru and Pakistan.
- Targets published for its 6 health, safety and environmental key performance indicators. These externally assured to financial audit standards ('reasonable' level) by PwC/KPMG
- Global minimum environmental standards
- Biodiversity Standard published, first company to commit not to explore or drill for hydrocarbons in natural World Heritage sites.

Financial impacts

Fundamentals

Share price performance

Figure 21
Shell Share Price (indexed) vs World DS Integrated Oil Sector (indexed)



Share price growth in the mid-1990s appeared to be largely unaffected, during a period where news on Shell's activities in Nigeria and the disposal of Brent Spar first came under public scrutiny and attracted criticism from NGOs and from some investors. Despite possible damage to the company's reputation from these situations, and the subsequent lodging of the shareholder resolution in 1997, share price rose steadily up until the financial crisis in the Asian markets. This crisis accounts for the fall in share price at that time, rather than the announcement that Shell was leaving the GCC.

Between 1997 and 2001 the trend in the company's share price was a generally upward one and it clearly outperformed the sector. It was during this period that Shell became far more transparent about its environmental performance and developed a new approach towards environmental governance. This long period of out-performance does seem to have been in conjunction with Shell becoming a more transparent company so far as its environmental and social performance is concerned.

(Recent events at Shell, including the resignation of senior board members, are unlikely to be associated with any significant failings in terms of environmental governance issues, and relate more to traditional governance standards and accounting procedures. 'Shell audits the externally reported environmental key performance indicators to financial standards using the services of PWC and KPMG. Its 7 HSE key performance indicators (fatalities, TRCF, GWP, flaring, energy efficiency, spills and fines & settlements) are all assured to a high ('reasonable' in IFAC audit parlance) level of assurance by joint auditors KPMG and PwC'.).

Net proceeds, earnings per share (EPS), dividend per share, P/E ratio

The highly publicised debate on Brent Spar which ran from 1995 to 1998 and events in Nigeria, are two challenging episodes in Shell's history. By the end of that period EPS had fallen to less than 1 pence and it is possible that concerns about the company's reputation played a part in this decline. However in the last four to five years, as Shell's image as a responsible global company has been developed, so too has EPS been boosted. Against a background of the company becoming more focused on sustainability, dividend policy also seems sustainable, with DPS increasing year on year.

The dismantling of the Brent Spar Oil Rig is estimated to have cost US$60 - 80m compared with US$7m cost of dumping it, the solution that Shell had proposed initially. This figure appears insignificant relative to Shell's gross proceeds of US$104bn in 1997 and $138bn in 1998 (less than one fiftieth of a percent) and has not played any obvious role in the share price or P/E ratios. The cost is slightly more noticeable when compared to Shell's net income of US$ 4.7 billion in 1997 and US$0.35bn in 1998. The impact of new environmental governance strategies on intangibles may be more marked, as discussed below. In 2004, Shell is preparing to remove the last traces of the controversial Brent Spar oil-storage platform from the North Sea. It plans to uproot the six giant concrete anchor blocks from the seabed as part of a project costing more than £20million.

Intangibles

Corporate reputation

As noted above, in the mid-1990s Shell's reputation came under scrutiny in the wake of some high profile media coverage and NGO campaigns, in some instances criticising the company for its handling of the Brent Spar platform and its operations in Nigeria. In the last five to six years the company has sought to avoid such potentially negative press and its environmental governance approach, as part of its sustainability strategy, has certainly struck a chord within the SRI research community. Shell was ranked best in the oil, gas and coal industry of the global Dow Jones Sustainability Index (DJSI) both in 2001 and 2002. As well as being included in the DJSI, Shell is also a constituent company of the FTSE4GOOD index. In 2003, as noted by Shell in its social report, leading financial institution Storebrand awarded Shell 'best in class status' for its leading environmental and social performance and the company qualified for investment in the Storebrand SRI mandate. In 2002, SHELL ranked 1st within the Petroleum Refining industry in Fortune's list of Global Most Admired Companies. Additionally, according to research carried out by Harris Interactive, Royal Dutch Shell ranks 51st among the 60 most visible companies in America with the best reputations – the second best ranking awarded in the O&G sector.

Competitive advantage

In its 'Spotlight on business environmental report' 2000 the Environment Agency itself named Shell UK as a 'good performer' for its reductions in emissions, while repeat offenders and Shell competitors were named as 'poor performers'. On the issue of climate change, the Carbon Disclosure Project 2003 identified Shell as one of only four companies in the sector whose corporate positioning on the issue was judged to be fully comprehensive.

New markets

Shell Renewables has developed various new energy businesses based around environmental products:

Shell Solar - active across the entire value chain of solar photovoltaics, from silicon to end consumer, moved into the top five global players with the acquisition of Siemens Solar in April 2002. The company manufactures solar photovoltaic products in Europe, the US and Asia. Sales operations based in over 90 countries around the world provide customers with solar solutions to their energy requirements. Despite a challenging trading environment, the company has had notable successes including the contract to supply photovoltaic modules for the roof of the Munich Trade Fair Centre, in Germany, and the first solar home systems being delivered in Xinjiang, China. In 2003 Shell Solar became one of the world's largest solar photovoltaic businesses, with a more than 10% market share. The company has also ben exploring gas-to-liquids, hydrogen pilots and biofuels (via its investment in Intergen).

Shell WindEnergy - which focuses on developing and operating wind farms and selling ‘green’ electricity, building on its strengths in project management, financing and engineering design. Currently, business development is focused in Europe and North America. In the US, new projects will bring the total power generation capacity to 230MW. In Europe, the company is developing offshore projects in the Netherlands and the UK. Shell WindEnergy participates in the NoordzeeWind consortium which has agreed, with the Dutch government, to build a 100MW Wind Park.

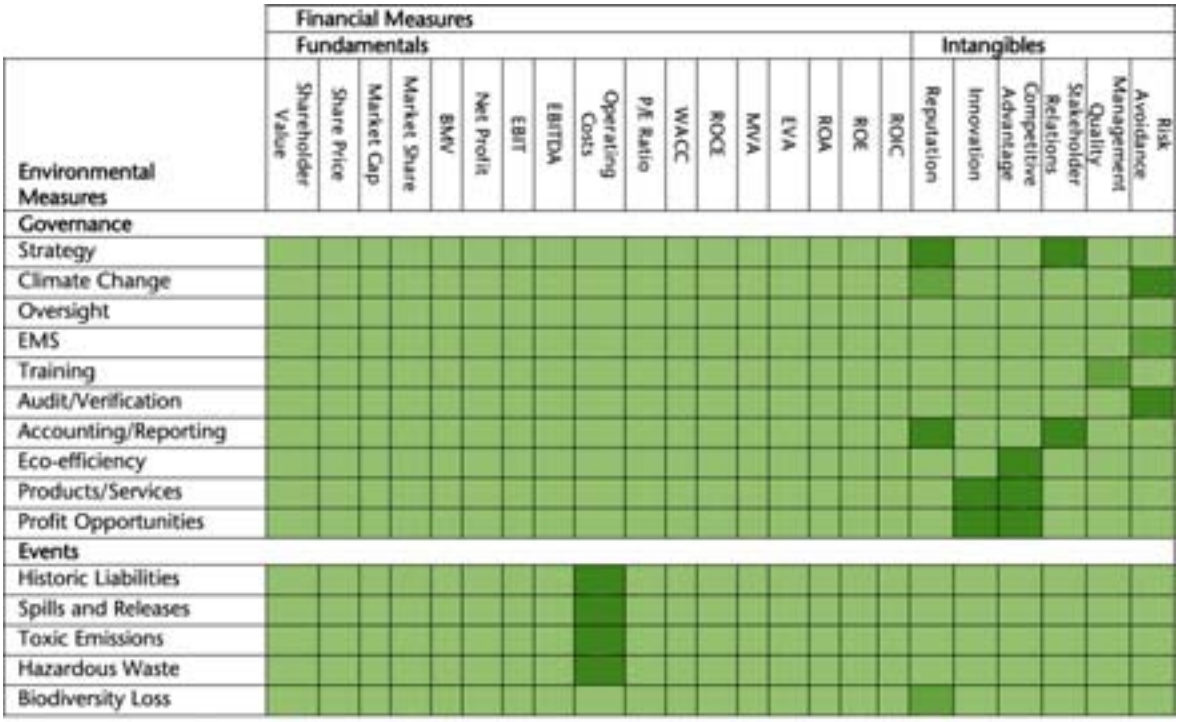
Shell Hydrogen, established in 1999, pursues and develops business opportunities related to hydrogen and fuel cells on a global basis. Four joint ventures have been created since inception, two of which were private capital joint ventures to invest in emerging companies concentrating on promising hydrogen and fuel cell technology. The remaining two focused on existing technology. One commercializing hydrogen-producing fuel processors while the other focusing on metal hydride hydrogen storage tanks. In 2002, the company announced a plan to build, in partnership with the Japanese government, the first hydrogen refueling station in Tokyo and a fleet of prototype vehicles. Also, in its aim to make hydrogen and other eco-fuels commercially available on a wide scale, the company acquired an equity stake in QuestAir Technologies Inc (Group interest 10.6%), and bought a US$29 million stake in Iogen. In 2003, the company opened its first Shell branded hydrogen station in Reykjavik, Iceland.

Operational efficiency

Relationships with local communities, especially in countries of operation such as South Africa and Nigeria, where local community strife can be very disruptive to production, it is essential that good environmental management systems are in place. The main environmental problems which Shell companies in Nigeria have been tackling in the last five to six years are gas flaring, oil spills, dredging of canals, and land use for the construction of facilities. The company improved its environmental management strategies in sensitive regions in Nigeria and South Africa. Shell is using technologies in the Niger Delta which are helping to minimise the effects of oil production on the environment.

The changes put in place follow on from adherence to the group's commitment to the principles of sustainable development and the use of best practice, world-wide. Thanks in part to improved community relations, and fewer disruptions to operations, in October 2003 Shell Petroleum Development Company of Nigeria Limited (SPDC) produced a five-year high of 1 million barrels of crude oil per day for two consecutive days, with indications this output could be sustained.

Appendix – summary of financial impacts identified



Key

Degree of correlation	Strong	Moderate	Little or None

14. Company Case Study – Vestas Wind Systems

Energy sold by the company has risen approximately 45% since 1997. Net turnover increased by 430% between 1997 and 2002

Summary

The Company

Vestas Wind Systems designs, manufactures, sells and installs wind turbines to generate electricity. The company operates worldwide through ten subsidiaries located mainly in Europe and in the United States, one joint-venture in India and sales offices all around the globe. Wind power is a promising alternative energy solution and an inherently sustainable business opportunity. Environmental values are integrated into the core culture of the company. Vestas is included in the DJSI and in the FTSE4Good indices. At the end of December 2003 Vestas shareholders gave their approval to a merger with local and global competitor NEG Micon. The new company will be called Vestas Wind Systems and is expected to command a 35% market share, with Euro2.7 billion in annual revenues.

Background

Vestas has built its entire business on harnessing wind power, a renewable energy that generates electricity. Its activities are therefore directly linked to environmental concerns, as Vestas essentially has been established to generate a profit from a progressive response to the issue of climate change, pollution and resource use. Many of the states that have signed and ratified the Kyoto protocol are pinning their hopes on wind power to reduce their CO2 emissions. At the same time, a strategy of energy diversification has become a major issue for European countries to grapple with. As an alternative to traditional energies such as oil and gas, wind power is assumed to be welcome in this context, in favour of the development of other types of renewable energies.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Business strategy devoted to exploitation of a new market for alternative sources of energy using an environmentally-friendly technology	Market penetration	Strong – has become a world leader in the two largest markets for wind power	Vestas has captured a 23% share of the European market and a 42% share of the US market
As above	Sales growth	Strong – impressive growth in turnover	The amount of energy sold by the company has risen approximately 45% since 1997. Net turnover increased by 430% between 1997 and 2002

Environmental Governance

Issues

- Growing international concerns about climate change and concerted action by governments and international institutions such as the UN, witness the recent Institutional Investors' Summit on Climate Risk at the UN headquarters
- In Europe, the diversification of energy sources is becoming a key challenge, firstly due to political and geo-strategic reasons - to gain economic independence from oil and gas producing countries - and secondly due to environmental considerations such as concerns about CO2 emissions or nuclear power
- The environmental impact of a completed wind turbine can be negative, in terms of its visual impression and emission of noise

- Wind power is still expensive compared to traditional energy, especially in the United States where electricity prices are typically between 2 to 4 cents per kWh while prices paid to wind developers range as high as 10 cents per kWh.

Responses

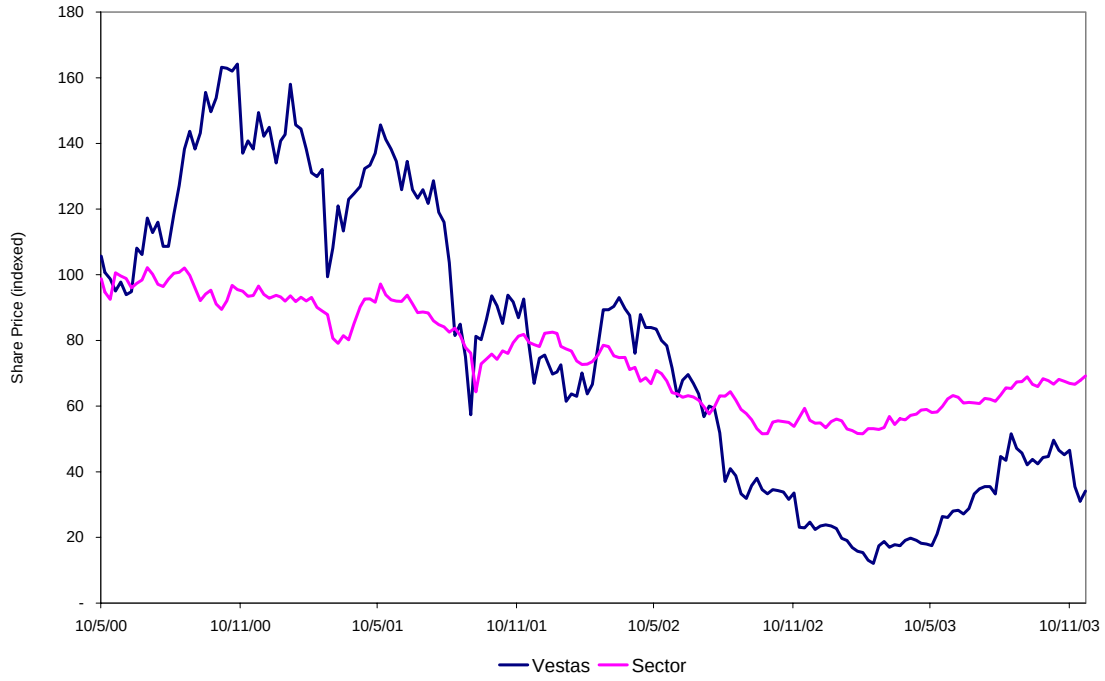
- Wind power is a clean technology, it is inexpensive and offers a solution to climate change issues which can be implemented quickly, although it has to be used in combination with other sources of energy
- Europe has led the way in developing wind power during recent years, especially in Germany, Spain and Denmark.
- Wind is the fastest growing form of electricity generation in the world and prices are projected to be competitive in the next decade, as the costs of utility-scaled wind turbines as well as operating costs are falling as the business expands
- The visual impression created by wind turbines, either positive or negative, is a completely subjective one, but Vestas strives to accommodate customer requirements while simultaneously attempting to ensure that the turbines have as neutral an effect on their surroundings as possible. Regarding noise, ongoing development projects are targeted at finding geometries and solutions intended to minimize noise emissions to circa 40 dB(A)
- The company is taking pre-emptive steps to detect the potential impact of wind turbines on bird populations and the potential allergenic effects of Prepreg, a laminate used in the production of turbines.
- In 2001, the EU approved a directive for the promotion of electricity produced by renewable sources and stated a global indicative target of 12% of gross natural energy consumption by 2010. That may seem to be a bold objective but according to the EWEA (the European Wind Energy Association), there are no technical economical or resource barriers to reaching this goal.

Financial impacts

Fundamentals

Share price performance

Figure 22
Vestas Share Price (indexed) vs World DS Industrial Conglomerates (indexed)



There is an intrinsic link between the Vestas share price and its environmental governance strategy, given that the success of the company will be judged largely on its ability to sell an environmental technology solution (hence no 'event' labels have been added to the chart above).

In the past two to three years, many analysts have been sceptical about possible in-roads that wind power can make into the energy market.

The Vestas merger is also an indication that there is overcapacity in the industry and analysts are predicting further consolidation in the wind power market. Such sentiments may have depressed company share price. The company is a fairly unique one and so sector comparisons are difficult to make.

Market share

Prior to the merger announcement, Vestas had captured a 23% share of the European market and 42% of the US market.

Intangibles

Corporate reputation

In an annual customer survey carried out in 2001, Vestas found that 93% of customers who responded (more than 50% sent back the questionnaire) stated that they were satisfied or very satisfied with Vestas' products.

Competitive advantage

Thanks to its size and industrial profile, Vestas is subject to less risk relative to other companies in the energy sector. As the UK market is finally opening to wind power, a significant potential market is up for grabs. In fact, £1bn is expected to be invested every year for the next seven years because the UK is Europe's windiest country and has therefore a massive potential for harnessing wind power. Analysts say that only manufacturers with big production capacity and real financial muscle will likely benefit from the selection of suppliers in 2006. They also must be able to support long service contracts of around 20 years. So far, then, only heavy weights like Vestas and GE Wind Energy, a subsidiary of General Electric, look certain to make the cut.

Vestas has the strongest production capacity of the two companies, has a subsidiary in Scotland where towers are made and turbines assembled and is already a supplier in the UK where it built the country's first offshore plant.

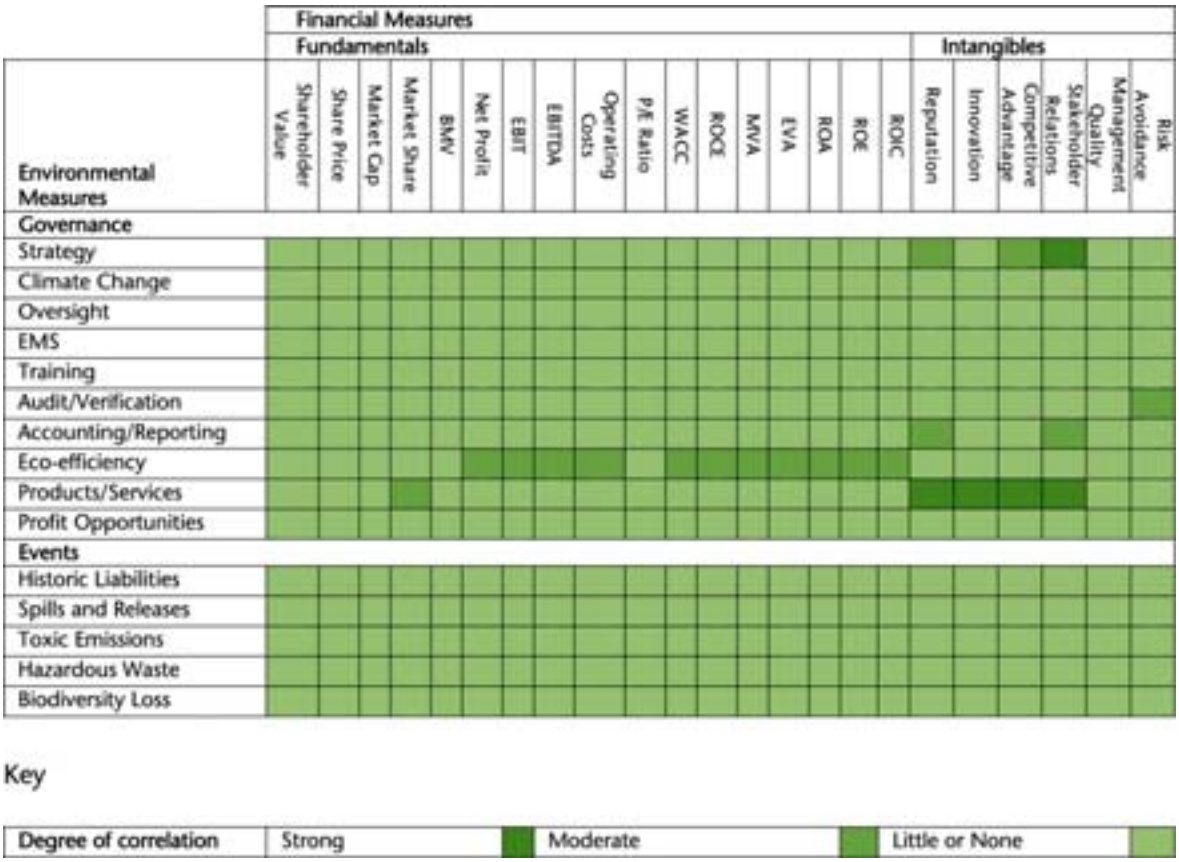
New markets

Wind power has expanded by an average of 25% annually during the past decade and Vestas has benefited greatly from this positive trend, increasing the amount of energy sold by approximately 45% since 1997. Net turnover increased by 430% between 1997 and 2002. Many studies project that, in Europe, wind power capacity will reach 30,000 MW by 2005 and 75,000 by 2010 which will represent one third of all new electricity generation capacity. Presently, 25 GW is produced by wind turbines.

In Europe as well as in the United States, renewable energies are promoted through different media and wind power is well positioned to be developed as the main alternative energy technology, as it is more competitive than solar or biomass for instance. For example, the World Bank launched a global greenhouse gas emissions trading fund in 2000 intended to support investments in clean energy. The Clean Skies initiative introduced in 2002 proposes tax incentives for renewable power of US$4.6bn over the next five years. It has also expanded the current 1.7 cent per kWh credit until 2004.

Vestas is quite confident for the future in Europe, especially because it has acquired a valuable experience in offshore wind turbines, and is actively seeking market share in developing countries where alternative energy solutions represent possible hope for economic improvement. Moreover, China and India were the major buyers in 2001 and Vestas is already well established in India.

Appendix – summary of financial impacts identified



Key

Degree of correlation	Strong	Moderate	Little or None

15. Company Case Study – Xstrata Plc

Announcement of climate change tax in Japan contributed to share price decline of 5% on one day in 2002. Increasing transparency on environmental governance from 2003 onwards helping to demonstrate company acknowledges environmental risks

Summary

The Company

Xstrata Plc's activities comprise four major businesses: coal (thermal and coking), copper, zinc (includes lead production) and ferroalloys. Xstrata's coal business has interests in over 30 operating coal mines located in Australia and South Africa. Copper operations are located in Queensland, Australia, with an additional joint venture in Argentina. The zinc business has mining and smelting operations in Australia, Germany, Spain and the UK. The ferroalloys business comprises ferrochrome and vanadium operations in South Africa and Australia. The group also has a forestry plantation in Chile. Xstrata's workforce is approximately 18,000.

Background

Xstrata listed as a FTSE100 constituent in March 2002 after former Swiss company Xstrata AG purchased the South African and Australian coal business of Glencore International AG. The company expanded in 2003 through the acquisition of MIM Holdings ('MIM') which added considerably to its coal assets, as well as adding copper to its portfolio. Some critics argued that Xstrata had not taken into account potential risks relating to global greenhouse gas mitigation, but Xstrata has made significant strides forward since its listing to position itself as a responsible company. In 2003 the company released its first sustainability report, covering health, safety, environmental and community issues. A follow-up report was published in April 2004. Using Global Reporting Initiative (GRI) guidelines to support the development of indicators and in the writing of its report, Xstrata has shown a strong commitment to environmental governance and environmental performance measurement.

Key Findings

Environmental Governance Measure	Financial Measure	Degree of Correlation	Quantifiable Impact?
Prior to MIM acquisition, Xstrata operations were highly reliant on markets for coal and consequently exposed to fluctuations in coal prices and taxes, including the effect of regulatory measures aimed at reducing climate change. Some critics argued Xtrata had not factored such exposure into its environmental governance strategy, though the company disputed such claims	Share price	Strong – Coal accounted for 66% of revenues, in 2003. Around 20% of Xstrata's thermal coal sales are to Japan.	Xstrata's share price experienced a decline of around 5% on one day in June 2002, which coincided with news that Japan was considering a coal tax.
Xstrata published its first sustainability report in 2003 revealing new environmental governance structures and policies throughout the company. A follow up report was published in April 2004.	Risk and reputation	Moderate – growing level of transparency in relation to environmental governance	Not measured but portfolio diversification has reduced exposure to future carbon risk and possible increase in corporate image in terms of its environmental governance.

Environmental Governance

Issues

- The metals and mining sector has received considerable criticism from NGOs, the media and public/consumer groups over its record on environmental management. Incidents such as the

broken tailings dams in Aznalcóllar (Spain, 1999) and Baia Mare (Romania, 2000) and concerns over the climate change implications from burning coal have exacerbated this trend.

- Short-term impact on shareholder value when Japan – a major Xstrata export market – announced its intention to introduce a tax on coal imports, in 2002. The effect of this announcement was compounded by volatility in the commodity market, depressed coal prices and uncertainty regarding the South African Minerals Development Bill (which will return land and natural resources to State ownership, requiring companies to apply for licences when operating mines). The latter event actually had a greater impact on Xstrata's share price, resulting in a 12% drop in one day (the same effect was experienced by Lonmin and Anglo American).
- Acquisition of MIM Holdings in June 2003, almost doubling its coal assets and production potential as well as increasing internal GHG emissions by 56%. Xstrata is now the world's largest export thermal coal producer, and Japan is currently its major customer for this commodity.

Responses

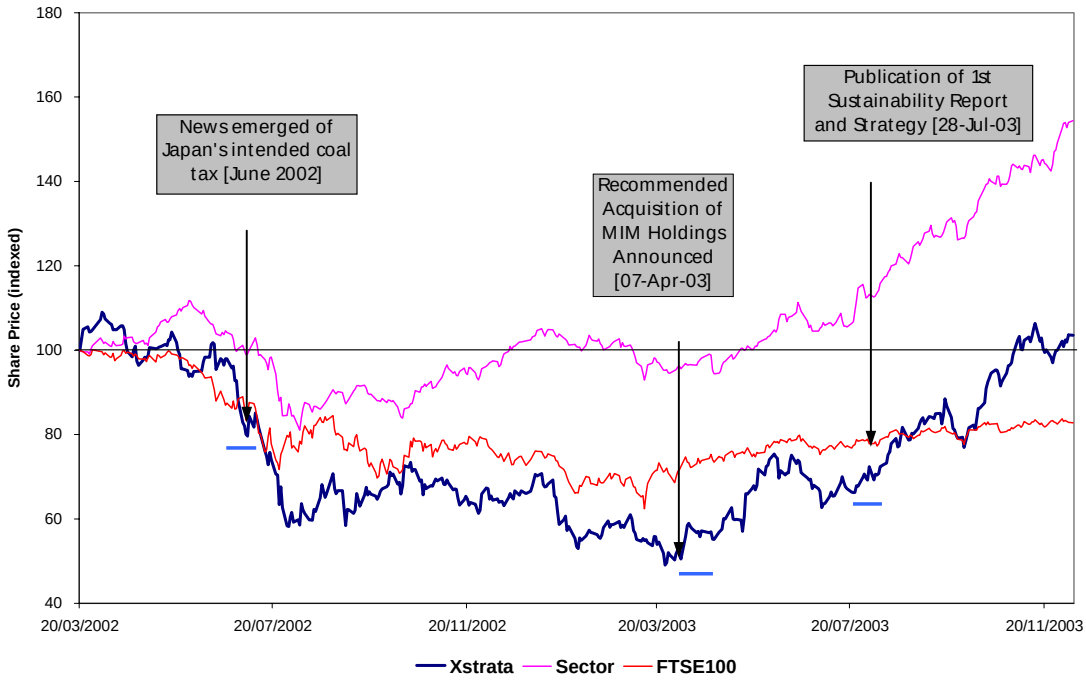
- Xstrata did discuss some of the potential liabilities or increased costs as a result of climate change legislation in its listing documents in March 2002. In particular, the company referred to the Kyoto Protocol and potential European and Japanese carbon taxes. This information was also included in the 'Circular to Shareholders' (April 2003) prior to the MIM acquisition and rights issue in June 2003.
- Published a set of 'Business Principles' and its first, comprehensive sustainability report in 2003. The report was based on the GRI guidelines with disclosure on a group level as well as by individual business divisions. The company's second sustainability report was published in April 2004, building upon its first sustainability report. Xstrata has set itself ongoing targets and has committed to reporting on its progress in future sustainability reports.
- A new global head of HSE was appointed in 2002, helping to coordinate the company's governance efforts at group level.
- Xstrata is involved in a number of Australian initiatives that seek to develop and promote 'Clean Coal Technologies' (CCT).
- The MIM acquisition added to the company's commodity portfolio, increasing its product diversification and thus to an extent indirectly mitigating longer-term financial risk of over-exposure to coal. In addition MIM has a good record on environmental management and was part of the 'Global Mining Initiative' and the Australian 'Greenhouse Challenge Program'. This will benefit the company as it incorporates a 56% increase in internal CO2 emissions prior to the MIM acquisition.

Financial impacts

Fundamentals

Share Price Performance

Figure 10
Xtrata Share Price (indexed) vs World DS Mining (indexed)



The principle market for thermal coal is for use in generating electrical power. Burning coal produces higher levels of greenhouse gases than the use of alternatives such as natural gas. Hence, any agreements restricting greenhouse gas emissions such as the Kyoto Protocol are of potential relevance to the company and its response to such developments is likely to have a bearing on share price.

Some critics accused Xstrata of downplaying the potential risks relating to global greenhouse gas mitigation efforts in the company's Listing Particulars. In a report from 2002 commissioned by Friends of the Earth UK (FoE) entitled *The Xstrata Listing: An Analysis of Climate Risks*, a number of alleged shortcomings and non-compliance with the Listing Rules were cited. Proponents of the view expressed in the FoE report – i.e. that climate change mitigation measures pose direct financial risks to companies such as Xstrata – cite events shortly after the listing as vindication of their position. In late June 2002, it emerged that the Japanese Ministry of Economy, Trade and Industry (METI) was considering introducing a tax on coal imports as a means to reduce greenhouse gas emissions. Within the Kyoto Protocol, Japan is committed to a 6% reduction of its greenhouse gases by 2008-2012. This intention was confirmed by METI on the 28 August 2002. In February 2003 the Japanese cabinet approved the tax, which is to be phased in by 2007 in three stages. The first stage was set to begin in October 2003 with a levy of Yen 1,230 per tonne of coal (approximately US$12 at current prices). When the news first surfaced in June 2002, Xstrata' share price fell by approximately 5% in one day, at a time when the FTSE100 was rising.

Xstrata has refuted all such allegations – arguing that it was not possible (nor even responsible in an official listings document) to attempt to quantify the potential financial impacts of climate change legislation – and published its own comprehensive assessment of and response to the FoE report, demonstrating that the company is taking its environmental governance approach seriously. In addition, the company considers that it recognizes climate change risks and refers to the issue in two major documents. Firstly, in Xstrata's Listing Particulars, published in March 2002. Secondly, in Xstrata's 'Circular to Shareholders' published in April 2003 prior to its acquisition of MIM. Both documents discuss the potential impacts to Xstrata's business from new or tightened legislation

and resulting instruments (such as carbon taxes) aimed at reducing greenhouse gas emissions, for example:

New legislation or regulations may be adopted in the future that may materially adversely affect the Group's mining operations, its cost structure or its customers' ability to use the Group's products, particularly coal…[or]…may also require the Group or its customers to change operations significantly or incur increased costs. [Xstrata Plc Listing Particulars, March 2002, p.61-62]

Other factors may also have played a role in share price fluctuations. Depressed coal prices, generally volatile global commodity markets, global insecurity and the uncertainties over the South African Mineral and Petroleum Resources Development Bill [2001] meant that 2002 was a challenging year for a new mining company to go public.

Other major mining companies such as Rio Tinto and BHP Billiton also experienced a dip in their share price, although less marked – approximately 2% over the same day. Xstrata's share price remained depressed for several months, until April 2003. However, the company's share price has rallied significantly from April onwards, doubling in value by December 2003, ending the year 20% higher than the FTSE100. This rally would appear to coincide with news of Xstrata's acquisition of MIM. Furthermore, the diversification of Xstrata's portfolio to include a significant copper business (as a result of the MIM purchase) occurred at a time when global commodity prices were experiencing a significant upturn.

It is possible that company documents such as the sustainability reports and MIM shareholder circular, published since April 2003 have contributed to positive market sentiment that the company has responded successfully to the challenge implementing sound environmental governance practices.

Intangibles

Corporate reputation

South African Xstrata subsidiary Vanadium Technologies (VanTech) has been in the spotlight over the last year due to the alleged exposure of the company's workforce to chemicals in vanadium mines. Critics point to an independent study published in the American Journal of Industrial Medicine in 1999 which states that Xstrata mine workers were exposed to levels of vanadium pentoxide, sulphur dioxide and ammonia significantly above the legal maximum. Xstrata has denied culpability in the deaths of four workers from VanTech. Furthermore, the company states that it was "completely exonerated" in an investigation carried out by the South African Department of Minerals and Energy Affairs in conjunction with the National Union of Mineworkers and the company itself.

Xstrata was publicly criticized by the Australian Department of Environmental Protection (DEP) in 2001 in relation to pollution control at the company's vanadium refinery in Windamurra. Ten separate breaches over two years were recorded by the DEP. In response, Xstrata stated it would install additional pollution control equipment. The plant is currently "under care and maintenance only" after Xstrata's new management suspended operations at the Windamurra plant in 2002 [Xstrata HSE report 2003].

Xstrata was also found to be polluting a local river in South Africa, near to its chrome mining operations. Deposits of chrome silt were running off into the stream and causing a build up of black sludge. However, the company openly admitted this and committed to rehabilitating the stream within a year. This rehabilitation is now complete and has received praise from government, community and NGO groups.

Competitive advantage and new markets

Since the acquisition of MIM in 2003, Xstrata's commodity portfolio has diversified considerably. In 2002 more than 66% of the company's earnings were from its coal business. In 2003 this has reduced to 28.6%, with copper now making up the lion's share of Xstrata's earnings. However, the majority of Xstrata's business is still thermal coal and – as the company itself sets out in its listing particulars and subsequent documents – by virtue of this the company may face competitive and regulatory risks in the long-term if the global demand for non-coal fuels increases as a result of

GHG emissions mitigation. Clean coal technologies (CCTs) may help to protect the company from a significant future loss of sales, but these technologies are still embryonic and expensive.

Xstrata is involved in a number of Australian initiatives that focus on clean coal technologies and GHG emissions reduction. For example, Xstrata is a participant in the Australian Coal Association's COAL21 program – a partnership between industry, government and the research community – and the Australian Greenhouse Gas Abatement Programme. The goal of the COAL21 program is to "create a national plan to scope, develop, demonstrate and implement near zero emissions coal-based electricity generation". Xstrata is also involved in research programmes focusing on CO2 capture and storage and CCTs such as Integrated Gasification Combined Cycle (IGCC) power generation. The company's commitment in this area is approximately US$9 million over the next five years.

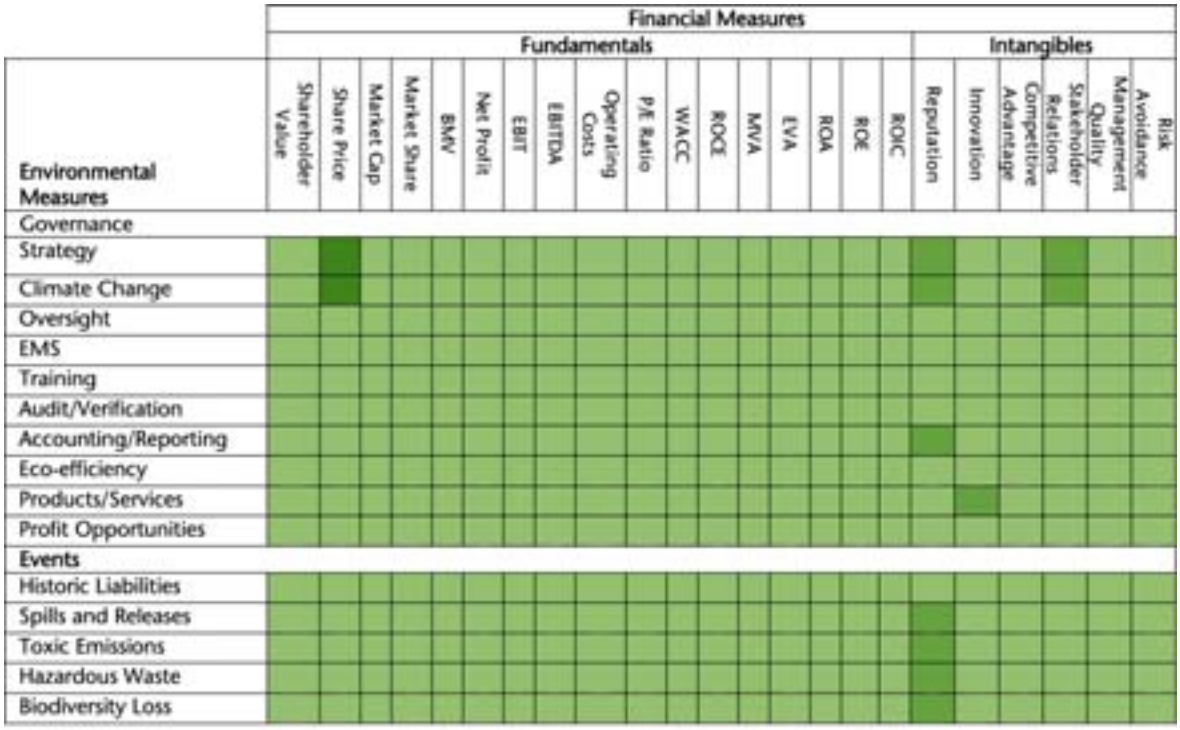
Operational efficiency

Due to the potentially high impact on both the natural environment and communities where Xstrata operates, good environmental management and strong workforce and community relations are important in maintaining its licence to operate. Since its UK listing in 2002 Xstrata has shown considerable commitment to good environmental governance.

The company's strategy and management on a range of environmental, social and corporate governance issues is clearly set out in its business principles and sustainability reports.

Establishing and continuing good relationships with key stakeholders is critical to maintaining ongoing business activities and to building a strong corporate reputation. In 2003 Xstrata developed 'social involvement plans' for each of its main business units. These plans set out the strategy for listening to and involving communities and how it can provide financial resources to assist local development objectives. The former businesses of MIM will develop similar plans in 2004. In its current sustainability report Xstrata has committed to giving at least 1% of its pre-tax profit to community initiatives each year. In 2003 this equated to USD1.78 million. Total spending on community initiatives was USD3.6 million in 2003.

Appendix – summary of financial impacts identified



Key

Degree of correlation	Strong	Moderate	Little or None

Conclusions

How have the study objectives been met by the survey?

This study sought to address five key questions. The extent to which the results of the literature review and the case studies provide answers to these questions is summarised below.

- ❒ Is there evidence to support a positive link between the environmental governance of individual companies and their financial performance?

The overall finding from the literature review is that there is strong evidence that where a company has sound environmental governance policies, practices and performance, it is highly likely to result in improved financial performance. The evidence tends to be more compelling when comparative studies are undertaken, with differences in performance between leaders and laggards quite marked.

The case studies in this report confirm the findings of the literature review, in that changes in financial performance stemming from environmental governance measures can be demonstrated and quantified, although the extent to which these changes is due entirely to environmental governance issues is not always clear.

- ❒ If such a link exists, is it more pronounced in some sectors than in others?

The findings of the literature review suggest that relatively limited research has been undertaken on a sector specific basis. Where sector analysis has been carried out, the focus has generally been on sectors with higher environmental impacts. Most studies that have assessed impacts at the sector level agree that changes in financial performance are more marked when a sector has higher environmental impacts and risks.

Where the sector case studies are concerned, out-performance was demonstrated, for those company ranked highly on environmental governance criteria, albeit over a relatively short period. All the industries profiled in the case studies can be regarded as having relatively high environmental impacts, with the implication that high impact industries are likely to benefit from managing their impacts successfully.

- ❒ Is it possible to say which financial performance indicators best illustrate any effect environmental governance may have?

Studies identified in the literature review focused on environmental governance impacts on shareholder value, share price, operating costs and risk and reputation issues. So is there a reason why study authors choose to focus on these four financial measures?

The likely explanation is that study authors increasingly want to communicate results in a way that will be understood both by mainstream investors and by financial analysts. These groups exercise much power in the market and they are likely to need proof of an empirical connection before fully taking on board the potential financial increments which can be delivered by good environmental governance. In addition, share price as an indicator of financial performance is commonly used and easily understood.

- ❒ Can it be concluded that certain types of environmental governance measures will have an impact on certain financial indicators and is it possible to assess the longevity of the effect on financial performance?

The literature review found that while a wide range of environmental governance issues have been analysed, the focus has been biased towards environmental policy issues. A majority of the studies considered the impact of an overarching environmental strategy or, to a lesser extent, a climate change strategy. More detailed analysis of other, more specific elements of environmental governance are analysed somewhat more sporadically. Longevity of impact is difficult to assess since few of the studies take a time horizon of more than five years.

For the case studies, a number of companies where the impacts could be examined over a longer period of time, such as 3M and Baxter International, were selected. These studies did reveal that a long term environmental governance strategy could yield a continuing financial benefit.

- ❒ Is the body of research comprehensive in its coverage of environmental governance issues and financial indicators?

The coverage of both environmental governance measures and financial indicators is very broad. There is, however, a concentration of analysis around the impact of an environmental strategy on share price performance and shareholder value. Studies of individual companies are few and far between.

The company case studies in this report mostly demonstrated that is possible to take one key environmental governance measure and attempt to relate its impact to specific financial impacts, though the strength of the correlations is often difficult to assess, particularly in relation to share price and shareholder value, which may be influenced by many other market forces and corporate strategy decisions.

One area where links can be more clearly established is that of operational impacts. The cost of an eco-efficiency initiative and its financial outcomes can be measured fairly precisely when a company sets up the appropriate environmental accounting procedures.

Whilst this study has revealed evidence to support the broader question there is more work to be done to better understand the underlying detail, for example at the sector or indicator level.

Some limitations in interpreting the results from the literature

review

A majority of the studies found in the literature review support the argument that implementation of good environmental governance systems yields a positive financial outcome. What is the level of confidence that can be attributed to this overall conclusion? There are some aspects of the analysis which provide a relative degree of comfort in asserting the positive relationship between environmental governance and financial performance, and some aspects which do not.

On the positive side, the wide range of studies does facilitate an understanding of the prominence of environmental governance factors within different scenarios. This allows for comparison of impacts among different types of companies, sectors and funds. The company study category is by far the largest and hence offers insights into the performance of a broad assortment of publicly listed enterprises.

However, while the five year time frame used made the literature review a more manageable and contemporary undertaking, it does mean that the number of studies which fall under each category heading is quite small. In addition, many of the studies look at a diverse range of environmental issues and relate these to an equally diverse range of financial outcomes. Under this scenario, unless the authors specify how each separate environmental governance issue was linked to a specific financial indicator, pinning down the nature of the correlations becomes far more difficult.

Gaps in case study analysis

In terms of the sector case studies in this report, the evidence suggests that a good general standard of environmental governance represents an indicator of quality of management and

likelihood of improved financial return. The difficulty comes in pinning down which environmental governance factors contribute the most to the out-performance shown.

As regards specific financial impacts, before starting on the company case study analysis, some assumptions were made about the types of financial impacts that could result from implementation of environmental governance practices or from environmental events.

The following are descriptions of the case study outcomes that might have been expected:

- Companies (existing or new) where sustained rising value, profitability, share price, reputation etc is based around exploiting green technology / green business;
- Companies where value, profitability, share price, reputation etc have been subject to downward 'blips' due to poor environmental policy, record / performance;
- Companies where value, profitability, share price, reputation etc have been subject to upward 'blips due to good environmental policy, record / performance;
- Companies whose value, profitability, share price, reputation etc has risen/stayed higher due to change in policy / strong policy on the environment;
- Companies whose value, profitability, share price and reputation etc has either declined or is depressed due to a (lack of) environmental policy, poor environmental record / performance.

The results from the company cases studies suggest that in practice it is difficult to classify outcomes according to these five definitions. Many other factors clearly have a bearing on financial impacts.

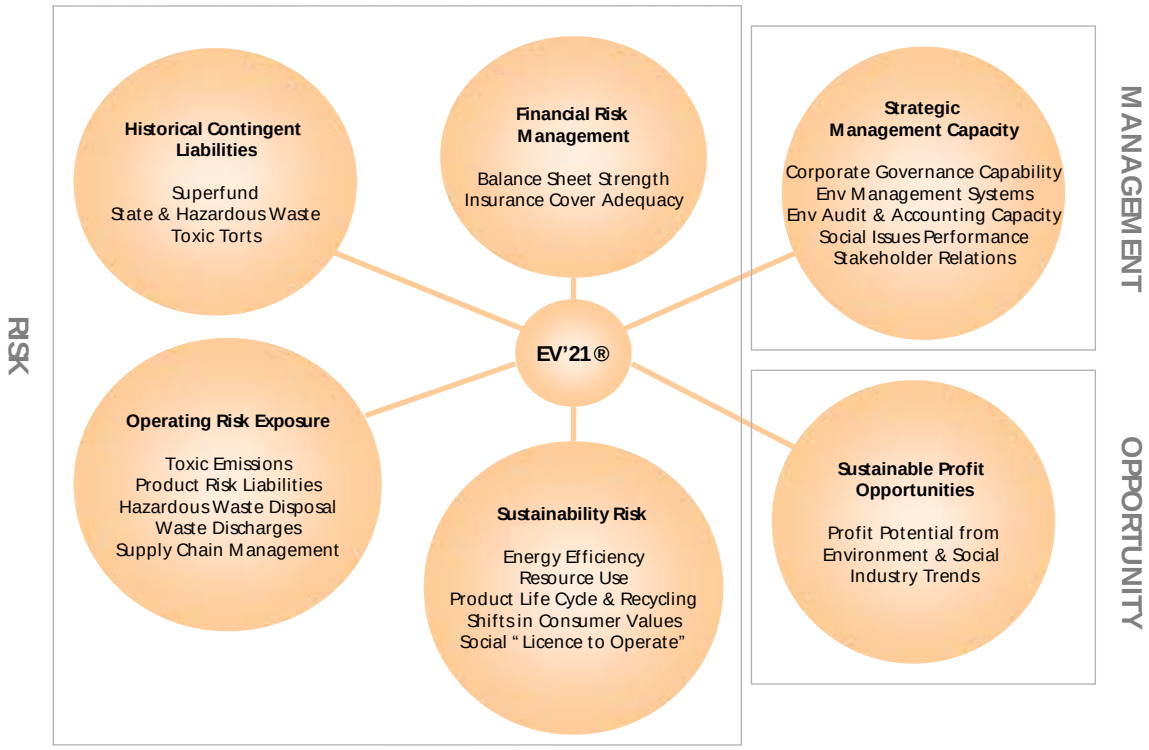
Clearly many factors, such as economic and political developments, have a potential bearing on financial impacts and influence the efficacy of the environmental governance effect.

Appendices

Environmental assessment criteria

To assess the impact of environmental governance on financial performance, Innovest has developed a proprietary tool – the EcoValue'21 investment analytics platform, which was developed in conjunction with strategic partners including PricewaterhouseCoopers and Morgan Stanley Asset Management. In total, the EcoValue'21TM model synthesizes over 60 data points and performance metrics, grouped together under six key value drivers, summarised schematically as follows:

The EcoValue'21™ Rating Model:



Companies are rated against the Innovest EcoValue'21TM performance criteria, and given a weighted score, as well as a letter grade (AAA, BB etc.). Each of the factors has an industry-specific weighting, based in part on a regression-based factor attribution analysis examining recent (5 year) stock market performance. The EcoValue'21TM investment risk ratings are ultimately expressed on a relative scale similar to those currently in use by conventional credit rating agencies such as Moody's and Standard and Poors. The sector case studies in this survey make reference to environmental leaders and laggards (as identified by the Innovest rating model) and assess the extent to which leaders may outperform laggards.

Companies which receive a BBB rating and above are deemed by Innovest to be the environmental governance leaders, while those companies with a rating below BBB are deemed to be below average performers in terms of environmental governance.

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Glossary of terms

BMV Book to Market Value. This is a measure of relative company value. It is derived by dividing the book value per share (net asset value) as per the financial accounts by the present market value (price) per share.

CSR Corporate Social Responsibility. This is essentially about demonstrating a company's value to investors, customers and society. A socially responsible company would act responsibly in all its locations and implement measures in relation to this. For example, this may include environmental stewardship, ensuring fair trade and equal opportunities, providing truthful reporting and communication, ensuring positive community relations and governance, and giving back to society.

EBIT Earnings Before Interest and Taxes. This is a measure of a company's earning power from ongoing operations. It is equal to earnings before deduction of interest payments and income taxes. EBIT represents the amount of cash that a company will be able to use to pay creditors. EBIT is also called operating profit.

EBITDA Earnings Before Interest, Taxes, Depreciation and Amortisation. This is a measure of a company's operating cashflow based on data from the company's income statement. It is calculated by looking at earnings before the deduction of interest expenses, taxes, depreciation, and amortisation. EBITDA is a useful measure for large companies with significant assets, and/or for companies with a significant amount of debt financing.

EVA Economic Value Added. This is the monetary value of an entity at the end of a time period minus the monetary value of that same entity at the beginning of that time period.

Market Cap Market Capitalisation. This is the market price of an entire company. It is calculated by multiplying the number of shares outstanding by the price per share.

Market Share This is the percentage of the total sales of a given type of product or service that is attributable to a given company.

MVA Market Value Added. This is the difference between the market value of a company (both equity and debt) and the capital contributed by investors. If it is positive, the company has increased the value of the capital entrusted to it. If it is negative, the company has destroyed value.

Operating Costs These are the day-to-day expenses incurred in running a business, (i.e. sales and administration).

P/E Ratio Price/Earnings Ratio. This represents the valuation ratio of a company's current share price compared to its per-share earnings. The P/E ratio is equal to a stock's market capitalisation divided by its after-tax earnings over a 12-month period. This is also called the earnings multiple.

ROA Return on Assets. This is a measure of a company's profitability. It is derived by dividing a fiscal year's earnings by total assets.

ROCE Return on Capital Employed. This is a measure of the returns that a company realizes from its capital. It is calculated as profit before interest and tax divided by the difference between total assets and current liabilities. The figure represents the efficiency with which capital is being utilised to generate revenue.

ROE Return on Equity. This is a measure of how well a company has used reinvested earnings to generate additional earnings. It is derived by dividing net income by book value. It is effectively how much profit a company is able to generate given the resources provided by shareholders.

ROIC	Return on Invested Capital. This is a measure of how effectively a company uses money (borrowed or owned) invested in its operations. It is calculated by dividing net income after taxes by total capital.
Share Price	This is the price of one share of stock.
Shareholder Value	This is the value that a shareholder is able to obtain from investment in a company. It includes capital gains, dividend payments, proceeds from buyback programmes and any other payouts.
SRI	Socially Responsible Investment. This involves, to varying degrees, the consideration or incorporation of social, environmental and/or ethical concerns into portfolio management.
Value driver	A factor which influences, either negatively of positively, the financial performance of the company

CONTACTS:

THE ENVIRONMENT AGENCY HEAD OFFICE

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD.
Tel: 01454 624 400 Fax: 01454 624 409

www.environment-agency.gov.uk
www.environment-agency.wales.gov.uk

enquiries@environment-agency.gov.uk

ENVIRONMENT AGENCY REGIONAL OFFICES

ANGLIAN
Kingfisher House
Goldhay Way
Orton Goldhay
Peterborough PE2 5ZR

MIDLANDS
Sapphire East
550 Streetsbrook Road
Solihull B91 1QT

NORTH EAST
Rivers House
21 Park Square South
Leeds LS1 2QG

NORTH WEST
PO Box 12
Richard Fairclough House
Knutsford Road
Warrington WA4 1HG

SOUTHERN
Guildbourne House
Chatsworth Road
Worthing
West Sussex BN11 1LD

SOUTH WEST
Manley House
Kestrel Way
Exeter EX2 7LQ

THAMES
Kings Meadow House
Kings Meadow Road
Reading RG1 8DQ

WALES
Cambria House
29 Newport Road
Cardiff CF24 0TP

ENVIRONMENT AGENCY
GENERAL ENQUIRY LINE
08708 506 506

ENVIRONMENT AGENCY
FLOODLINE
0845 988 1188

ENVIRONMENT AGENCY
EMERGENCY HOTLINE
0800 80 70 60

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