
SUSTAINABILITY, ENVIRONMENTAL LAW AND RULES-BASED SYSTEMS

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“If I have seen further than others, it is by standing upon the shoulders of giants.”

Sir Isaac Newton^{*}, 1676

^{*} NEWTON, I. & TURNBULL, H. W. 1959. *The correspondence of Isaac Newton*, Published for the Royal Society at the University Press.

Declaration of Originality

I hereby declare that the academic research presented herewith is fully my own, except for that which is appropriately referenced.

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Abstract

The thesis aims to create a rule-based framework in order to facilitate corporate strategy making and regulatory drafting pertaining to sustainable development. To do so, the premise is set that business sustainability can be broadly categorised in four interdependent pillars, namely, Environmental, Economic and Social sustainability and Corporate Governance. Accordingly, four case studies are devised, each focusing on one of said areas of business sustainability in different industries and business sectors. The findings of each case study are instrumental to the final conclusions of the current thesis.

Covering a vast array of examples in corporate behaviour with regards to business sustainability led to the understanding that industries and regulators suffer from a lack of a standardised approach to implement a common theme within sustainability. It is submitted that the current sustainability reporting standards do not distinguish between rules and advantageous reporting criteria. To alleviate this problem the thesis draws from the findings of each case study and devises a rules-based system which drafters of legislation and corporate sustainability strategists can benefit from as a set of guiding norms and principles to aid them in their implementing behaviours. These rules are discretionary in application and non-exhaustive; readers of said framework may choose which rules are most applicable and if so, how they would apply to their circumstances. Therefore, extensive opportunity for further research remains in order to complement the implementation of these rules.

Table of Contents

Declaration of Originality	2
Abstract.....	3
List of Figures.....	8
List of Tables	10
List of Acronyms	11
Firms within the Thesis	14
Copyright Declaration	15
Acknowledgements	16
Chapter 1: Introduction	17
1.1. Research Premise	17
1.2. The Meaning of “Sustainability”	21
1.2.1. Association with Sustainability	26
Chapter 2: Methodology.....	29
2.1. Starting Premise	29
2.1.1. Thesis Aim.....	31
2.2. Research Outline	31
2.3. Research Questions	36
2.4. Definitions of Frequently Used Terms.....	37
2.5. Literature Review	38
2.6. The Methodological Approach.....	39
2.6.1. Generalisation in Case Studies	41
2.7. Validation of Findings.....	43
Chapter 3: Legal Guidance on Access to Corporate Environmental Information.....	45
3.1. Introduction	45
3.1.1. Introduction to Company Law <i>vis-à-vis</i> Disclosure	48
3.2. Corporate Environmental Disclosure in England and Wales.....	50
3.3. Corporate Environmental Disclosure under EU Law	57
3.4. Corporate Environmental Disclosure in the United States.....	59
3.5. The Aarhus Convention	64
3.6. Fiduciary Duties and Corporate Environmental Disclosure in Practice	68
3.7. Environmental Impact.....	73
3.7.1. Measuring the Impact of the Company on the Environment.....	76
3.8. Disclosure through Market Intermediaries.....	81
3.8.1. Global Reporting Initiative.....	83

3.8.2. Adequate Extent of Disclosure	88
3.9. Conclusions	90
Chapter 4: Sustainable Technologies for Wastewater Treatment: Case Study of Firm A and Firm B.....	93
4.1. Introduction	93
4.2. Firm B	95
4.3. Reducing Carbon.....	96
4.3.1. The Challenge.....	96
4.3.2. The Solution	97
4.3.3. Measuring Performance.....	98
4.3.4. Results	98
4.4. Reducing Water Impact.....	100
4.4.1. The Challenge.....	100
4.5. The Water Impact Index (WII).....	100
4.5.1. The Components of WII.....	101
4.5.2. The WII Equation	101
4.5.3. Beyond Volume: The Importance of Water Stress.....	102
4.5.4. Direct and Indirect Water Impact Index	103
4.5.5. Going Further With Reuse Technology.....	105
4.5.6. Multiple Applications	106
4.6. Adding Value and Risk Management	107
4.6.1. Energy and Carbon	108
4.7. Conclusions	110
Chapter 5: Legislative guidance on the new Waste Framework Directive	112
5.1. Introduction	112
5.1.1. Methodology.....	118
5.2. Summary of the EU Waste Management Law Framework	118
5.3. Definition of Waste	119
5.3.1. Any Substance or Object	121
5.3.2. The Holder.....	122
5.3.3. Discard.....	125
5.3.4. Waste Criteria	131
5.4. By-products	132
5.4.1. Further Use is “Certain”	134
5.4.2. “Processing” and “Normal” Industrial Practice.....	138
5.4.3. “Integral Part” of Production Process.....	141
5.4.4. Further Use is “Legal”	142

5.4.5. Waste v By-Product Decision Tree	142
5.5. Products.....	142
5.6. End of Waste	145
5.7. Waste Management in the United States of America	148
5.7.1. Solid Wastes	149
5.7.2. Hazardous Wastes.....	150
5.7.3. Discard and Dispose	150
5.7.4. Exclusions from RCRA	152
5.8. Conclusions	155
Chapter 6: Sustainability in the Mining Industry: case study of Rio Tinto Plc.....	161
6.1. Introduction	161
6.2. Human Rights in Public International Law	165
6.2.1. Economic and Business Significance	167
6.3. Corporate Sustainability in Mining	173
6.3.1. Human Capital	174
6.3.2. Reputational Risk and Damage	179
6.3.3. Business Un-Sustainability.....	181
6.4. Rio Tinto	184
6.4.1. Rio Tinto and Social Sustainability	187
6.5. Efficacy of Sustainability Reporting Frameworks	190
6.5.1. RepRisk	190
6.5.2. Global Reporting Initiative	193
6.5.3. Greenwash by Virtue of Reporting Standards	194
6.6. Conclusions	195
Chapter 7: Analysis and Discussion	197
7.1. Introduction	197
7.1.1. Rationale for the Rules	200
7.1.2. Examples of Rules-Based Systems.....	206
7.2. Expert Opinion	209
7.3. The Rules.....	211
7.3.1. Corporate Governance	212
7.3.2. Environmental Sustainability	220
7.3.3. Economic Sustainability	231
7.3.4. Social Sustainability	235
7.4. Conclusions	242
Chapter 8: Thesis Conclusions and Recommendations	244
8.1. Research Questions	247

8.2. Further Research and Recommendations	251
References	254
Appendix I	270
Appendix II.....	272
Appendix III	274
Appendix IV	275
Appendix V	283
Appendix VI	285
Appendix VII.....	289
Appendix VIII	327

List of Figures

Figure 1: The outline of the methodology for the current thesis	32
Figure 2: Groat and Wang's diagram of conceptual framework for research methods, as simplified by Johansson (2002, 2003).....	40
Figure 3: Author's illustration and comparison between of Deductive, Inductive, and Abductive research methods.....	43
Figure 4: List of Core and Additional Environmental Performance Indicators (GRI, 2006) ..	85
Figure 5: Relationship between investing in sustainability measures and long-term economic prosperity	89
Figure 6: The installation of CSTR and MBBR technologies means the carbon footprint of Firm B's wastewater treatment plant could be reduced from 14,000 to 9,000 CO ₂ equivalent	99
Figure 7: Diagram of the components of the WII formula (Firm A).....	101
Figure 8: Water footprints based on volume (Shafer and Pinero, 2011)	103
Figure 9: Direct and Indirect Water Impact Index (Firm A)	104
Figure 10: The full process cycle of the WWTP (Firm A)	105
Figure 11: Industry WII assessments currently planned or in progress around the world (Firm A).....	106
Figure 12: Financial implications of reductions in carbon and water footprints (Firm A)....	107
Figure 13: Comparison between different changes in Net Present Value (Bachelay and Laget, 2010).....	108
Figure 14: Flowchart indicating what falls into the Hazardous Waste criterion and what is excluded (ORCR, 2011)	154
Figure 15: Rio Tinto Plc. Net Profit (Loss) for 2003 - 2012	185
Figure 16: RepRisk Index trend for Rio Tinto Plc., as of 24 April 2013 (RepRisk, 2013f)..	191
Figure 17: RepRisk Index trend for Veolia Environnement, as of 24 April 2013 (RepRisk, 2013h).....	191
Figure 18: Two scenarios projected by the International Energy Agency pertaining to the future levels of GHG emissions (IEA, 2012)	205
Figure 19: ISO 14001 Continuous Improvement cycle illustration by US Environmental Protection Agency (2013b).....	218
Figure 20: Two solutions for installation of a new wastewater treatment plant by Firm A ..	226
Figure 21: The difference between emission of air pollutants between the old (left) and the new (right) industrial electro filters at a gypsum manufacturing plant (Khorasan Gypsum, 2013)	227
Figure 22: Calculating the real water footprint of a given product (Firm A)	228
Figure 23: Methodology produced by Firm A for calculating the total cost of carbon emissions (Firm A)	229

Figure 24: Profiling of employee competencies and skills (Times 100, 2013b)	237
Figure 25: Flow chart demonstrating the legal definition of waste, according to Directive 2008/98/EC.....	272
Figure 26: Elaborated Waste versus By-product decision making tool.....	274

List of Tables

Table 1: Seven sustainability revolutions (Elkington, 1997).....	20
Table 2: Terms commonly used within the current thesis and their associated definitions	38
Table 3: Solid waste exclusions (ORCR, 2011)	153
Table 4: 2011 Coal production statistics and corresponding fatalities by country (EIA, 2013)	176
Table 5: Comparing the cost of fatalities to revenue in each country, with the cost of each fatality being fixed to that of the US	178
Table 6: Scope of criteria considered in the RepRisk framework (RepRisk, 2013g).....	180
Table 7: List of Rules, as derived from the case study research conducted in preceding Chapters.....	212
Table 8: List of Transferable Skills courses attended and the corresponding dates	271
Table 9: Waste criteria framework (drawn from section 4.4.).....	273

List of Acronyms

ABI	Association of British Insurers
Art.	Article
ATCA	Alien Tort Claims Act of the United States of America
BAT	Best Available Techniques
BATNEEC	Best Available Techniques Not Entailing Excessive Costs
BATREF	BAT Reference Documents
CCA	Copper-Chrome-Arsenic
CDP	Carbon Disclosure Project
CGC	Corporate Governance Code
CLG	Department for Communities and Local Government
CO₂	Carbon Dioxide
COD	Chemical Oxygen Demand
CRC	Carbon Reduction Commitment
CRDI	Climate Risk Disclosure Initiative
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DG	Director General
DOJ	US Department of Justice
EC	European Community
ECJ	European Court of Justice
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EPA	US Environmental Protection Agency
ETS	Emissions Trading Scheme
EU	The European Union
FRC	Financial Reporting Council
FT	The Financial Times
G&A Institute	Governance and Accountability Institute
GBR	General Binding Rules
GHG	Greenhouse Gas
GPI	Genuine Progress Indicator
GRI	Global Reporting Initiative
ICC	International Chamber of Commerce

IEA	International Energy Agency
IED	Industrial Emissions Directive
IISD	International Institute for Sustainable Development
ILO	International Labour Organisation
ISO	International Organization for Standardization
KPI	Key Performance Indicator
LCA	Life Cycle Assessment
MEP Act	Malta Environment and Planning Act
MEPA	Malta Environment and Planning Authority
MSHA	Mining Safety and Health Association
NAIC	US National Association of Insurance Commissioners
NGO	Non-governmental Organisation
NICICO	National Iranian Copper Industries Company
NPV	Net Present Value
NRTC	Norms on the Responsibilities of Transnational Corporations and Other Business Enterprises with regard to Human Rights
OECD	The Organisation for Economic Co-operation and Development
OFR	Operating and Financial Review
OFT	Office of Fair Trading
ORCR	RCRA Orientation Manual
OSC	National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling
PAC	Powdered Activated Carbon
PhD	Doctor of Philosophy
PPP	Purchasing Power Parity
PRP	Potential Responsible Parties
RCRA	Resource Conservation and Recovery Act
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
RRI	RepRisk Index
SBSC	Sustainability Balance Score Card
SEC	Securities and Exchange Commission
SI	Statutory Instrument
TEPKO	Tokyo Electric Power Company
TQM	Total Quality Management

UDHR	Universal Declaration of Human Rights
UK	The United Kingdom of Great Britain and Northern Ireland
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNECE	United Nations Economic Commission for Europe
UNFCCC	UN Framework Convention on Climate Change
UNGC	UN Global Compact
US	The United States of America
WECD	World Commission on Environment and Development
WII	Water Impact Index
WQDF	Water Quality Framework Directive
WSI	Pfister's Water Stress Index
WWTP	Waste Water Treatment Plant

Firms within the Thesis

There are a number of firms with which research collaboration has taken place for the completion of this thesis. The identity of these firms shall remain confidential principally due to the collaboration agreements with said firms in which there was an inherent agreement of confidentiality. Nonetheless, the case studies in Chapters 4, 5 and 6 have been conducted based on information received from these firms. Therefore in order to help in contextualising the case studies in this thesis the following descriptions should be noted.

The firms are annotated using the English alphabet and are referred to as such throughout the thesis. They are described as follows:

Firm	Description
Firm A	A large multinational utilities firm which is mainly active in municipal and industrial water provision and is headquartered in France
Firm B	A large multinational firm which is one of the main market players of the global cosmetics industry
Firm C	A large multinational firm which is one of the main market players in the global oil and gas industry and is headquartered in the US

It is, furthermore, noted that all citations have also been anonymised accordingly and all references removed from the Bibliography list. As such, all relevant citations have been noted in the same way. All the correct references and citations have been noted accurately elsewhere and may be released upon request from the author.

Copyright Declaration

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1 INTRODUCTION

Chapter 1: Introduction

The current PhD research thesis provides a new approach to corporate sustainability by introducing a novel rules-based framework. This framework is intended to aid firms when drafting corporate sustainability strategies. A number of rules have been drawn from the findings of the case studies conducted during this research thesis. These rules are designed to assist firms in taking sustainability strategies forward. The rules contained within the framework in Chapter 7 will also assist regulators in drafting comprehensive legislation aimed at addressing national sustainability challenges.

1.1. Research Premise

The overriding hypothesis that serves as the basis for this research is that a rule-based sustainability strategy will constitute a beneficial influence for firms, if only for risk management purposes. It is important to note that the following PhD research thesis has been drafted mainly from a legal perspective; as such, much of the problem solving instances

therein has been conducted in the form of legal analysis, whilst every attempt is made to widen the scope and benefits of said thesis for academics and readers of other disciplines. To provide the essential context, the following observations are in order.

Companies are perceived as legal persons in the eyes of Law. This enables companies to conduct business and become an active and influential entity in the society (even though they only benefit from legal personality rather than natural personality). As such, similar to the virtues of a person, companies may choose to be “good corporate citizens” or otherwise pursue a purely short-term profit seeking strategy.

The culture of profit-seeking among large¹ and multinational corporations in the past half a century has led to an unprecedented rate of consumption and depletion of natural resources. The face value of this trend has been an exceptional economic growth, for which large and multinational corporations are collectively responsible. Conventionally economic growth is interpreted as economic prosperity (Victor, 2010). Nevertheless modern economic assessment tools such as the Genuine Progress Indicator (GPI) indicate that actually the state of general welfare across the economy (in the US) has reduced significantly from 1970-2000. Conventionally, GPI takes account of the cost of resource depletion, cost of ozone depletion, cost of air, water, and noise pollution, loss of farmland, and loss of wetlands, *inter alia* (*Ibid*). According to Dillard et al, in light of these changes in perception, human society has been faced with a twin imperative to raise global living standards and to live within environmental limits, exemplified by the current concern over global climate change (2008).

Another such distinction is found in the change in tone between two of the leading thinkers in Economics, namely Milton Friedman and Joseph E. Stiglitz, both of whom received the Nobel Memorial Prize in Economics (in 1976 and 2001 respectively). In response to the dawn of corporate social responsibility, Milton Friedman famously stated that the “social responsibility of business is to increase its profits”, and thereby dismissing the notion of external costs of firm operations (Friedman, 1970). In 2001, however, during the Nobel Memorial Prize ceremonies, Joseph E. Stiglitz stated that “as we think about [the] crisis of

¹ In this thesis, whenever reference is made company sizes, the definitions provided by the European Commission in *Working Document SEC (2009) 1350 final* is used. Large companies are, therefore, companies which are above the specified threshold for Medium sized companies.

[climate change], we should think about how we can create a global economic architecture which works better, for more people, in a more sustainable way” (UN, 2009). These two statements represent a significant development in the theory of the firm.

Simultaneously with this trend, sustainability and sustainable development emerged as new topics when the global society began to understand the increasing impact of its activities on the world; gradually, sustainability was adopted as a common political goal (Hutchins and Sutherland, 2008, McKenzie, 2004, Dillard et al., 2008). It is suggested that the challenge of sustainability is to “limit the environmental harm created by human activity while reducing the deprivation and suffering resulting from poverty” (Dillard et al., 2008).

One of the first definitions of sustainable development, which highlighted the issue as a global challenge, was published by the World Commission on Environment and Development in the Brundtland Commission Report) that described sustainable development as meeting “the needs of the present without compromising the ability of future generations to meet their needs” (WCED, 1987). To that end, issues which traditionally were deemed peripheral to mainstream business activities have become to the forefront of business scholarship and the focus of long-term strategies of many multinational firms (Dillard et al., 2008).

This thesis assumes that in a resource-constrained world, there is a distinction in the market place between firms which are mindful of the external costs of their business operations and those which tend to be ignorant of said effects. Ultimately, in terms of business scholarship, these represent differing corporate strategies, which are exemplified throughout the thesis by way of examples and case studies. It is submitted that the use of case studies in PhD research theses in order to understand corporate behaviour in a certain aspect of business activities and possible solutions for amending said behaviour is indeed a novel approach.

One such example, which is utilised repeatedly is that of Firm C and British Petroleum; the former pursues a zero-risk strategy which has led to a near-perfect environmental and operational business record in Europe, and the latter whose lack of adherence to internal rules and legislation led to an explosion on one of the firm’s oil rigs near the Gulf of Mexico in the US (Skjærseth, 2003, Calkins, 2010).

The effect of firms' operations on their stakeholders is of central importance to this thesis. Stakeholders are defined as any group or individual who can affect or is affected by the achievements of an organisation's purpose (Freeman, 2010). Actions of large and multinational companies have a more significant effect on a global scale compare to those of small or medium sized businesses. Many examples are provided to this effect in Chapters 3 and (mostly) 6 where lack of good practice in certain areas of business operations by large and multinational firms have had devastating effects on the daily lives and environments of their surrounding communities. Naturally, therefore, it is of crucial importance for said stakeholders that companies abide by a sustainability strategy, be it only focusing on environmental, economic or social sustainability. Many corporations adapt such strategies as a means to differentiate themselves from competitors or otherwise reduce overhead costs or other general costs of conducting business (Schaltegger and Burritt, 2006).

John Elkington, the pioneer thinker of the Triple Bottom Line model, in his book *Cannibals with Forks: The Triple Bottom Line of 21st Century Business* identifies seven revolutions in different categories, which drive the change in general perceptions among firms and consumers (Elkington, 1997, 2004). These have been outlined in table 1 and show shifting paradigms in seven different categories.

Drivers	Old Paradigm	New Paradigm
Markets	Compliance	Competition
Values	Hard	Soft
Transparency	Closed	Open
Life-cycle technology	Product	Function
Partnerships	Subversion	Symbiosis
Time	Wider	Longer
Corporate Governance	Exclusive	Inclusive

Table 1: Seven sustainability revolutions (Elkington, 1997)

It has been assumed in this thesis that the majority of large and multinational companies have drawn up a strategy pertaining to sustainability in their companies. There are two principal reasons behind this assumption. First is the rise of consumer awareness campaigns and customer expectations that products are sourced from sustainable resources (Jaffry et al., 2004, Krarup and Russell, 2005). In light of consumer expectations companies may invest in research and development so as to become the market leader in sustainable products and

services². On the other hand, companies may feel it unnecessary to invest in implementing such strategies due to the nature of their businesses (such as business to business relationships and monopoly market players). In such cases, where profitability is deemed unrelated to their sustainability strategies, said company may be forced to depart from the status quo of their business model in order to comply with new and progressive regulations³, which is the second reason for this assumption. However at times new legislation has been ambiguous in the new direction they imposed and so led to confusion in the market place⁴.

This thesis will examine the possibility of creating a rules-based framework in order to propagate and promote sustainability within corporations and regulators. The submission of the current research thesis is that the adoption of a bespoke rule-based framework will benefit the firm (and regulator) as well as its stakeholders, in that it will help mitigate various risks. The predominant methodology is that of using case studies, where each case study will constitute a Chapter of this thesis. Case studies will illustrate firms' corporate strategies, which in turn will either be deemed sustainable or not. The Framework of Rules contained in Chapter 7 is derived predominantly from these case studies.

1.2. The Meaning of “Sustainability”

As Dyllick and Hockerts write, sustainability has become the mantra of the 21st Century, while embodying the “promise of societal evolution towards a more equitable and wealthy world in which the natural environment and our cultural achievements are preserved for generations to come” (Dyllick and Hockerts, 2002).

The concept of sustainability emerged in the 1960s in response to concerns about environmental degradation resulting from poor resource management. One of the first international entities which emphasised sustainability was the Organisation for Economic Cooperation and Development (OECD), which was established in 1960 and promoted policies that would achieve “the highest sustainable economic growth and employment in

² Firm A is one such example, as demonstrated in Chapter 4.

³ The European Union for example has actively sought the enactment of Directives and Regulations in pursuit of environmental protection. This movement has gained traction in many jurisdictions such as that of the United States of America, EU (and thereby her Member States), Middle Eastern countries and so on.

⁴ See Chapter 5 (Firm C case study) and Chapter 3.

Member countries in order to stimulate employment and increase living standards” (OECD, 1960).

It has been argued that Rachel Carson’s *Silent Spring* in 1962 helped shed light on the concept of sustainable development and the interrelationship among environment, the economy and social well-being (Carson, 1962, IISD, 2012). The International Institute for Sustainable Development has produced a timeline on the development of the concept of sustainable development. The report states that there are 120 reports or events which have marked a milestone in our understanding of the concept, beginning with Carson’s book in 1962 and ending with the Rio+20 report (IISD, 2012). There are academics, however, who believe that a momentum to carry the movement of success which was created after the original Rio conference has been absent ever since (Dyllick and Hockerts, 2002).

The conventional definition of sustainable development which is referenced most often is that provided by the Brundtland report, as “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, UN, 2010). This definition of sustainable development is commonly cited as a definition of sustainability as a whole, and presupposes the necessity of development rather than focusing on strategies for the maintenance of current conditions (McKenzie, 2004).

Twenty years after the first Rio Earth Summit in 1992, the United Nations Conference on Sustainable Development was hosted by Rio de Janeiro, Brazil, again in 2012 – also known as Rio+20. It adopted a document titled “The Future We Want”, reaffirming what had been agreed 20 years ago. The major innovative theme of the Rio+20 was the introduction of the Green Economy, which is defined as one which is low carbon, resource efficient and socially inclusive (UNDESA, 2012).

It is noteworthy that the Brundtland definition and the sustainable development agenda as a whole have been subject to much criticism. As McKenzie notes, the most extreme of these criticisms is that sustainable development, when defined vaguely in order to meet the needs of all stakeholders, “is a smokescreen behind which business can continue its operations essentially unhindered by environmental concerns, while paying lip service to the needs of future generations” (2004). The ambiguous nature of the definition inherently allows firms to declare their interest in sustainability while actually being the perpetrators of unsustainability

(Jacobs, 1999). Furthermore, it has been argued that the focus on development in deprived areas “tends to evade the uncomfortable issue of the need to restrain consumption on the part of the affluent” (Joshi, 2002, p. 7).

An alternative definition of sustainability is provided by Mihelcic et al., such that the “[design and operation of] human and industrial systems to ensure that humankind's use of natural resources and cycles do not lead to diminished quality of life due either to losses in future economic opportunities or to adverse impacts on social conditions, human health and the environment” (Mihelcic et al., 2003). Moreover, Mihelcic et al. believe that clear metrics, or measures of performance are required in order to evaluate the efficacy of any decision on the resulting sustainability (2003, Hutchins and Sutherland, 2008).

The conventional definition of sustainability remains derivable from the definition of “sustainable development” in the Brundtland report. The definition there and in the Rio documents call for a combination of ecological, economic, social and institutional aspects of social development (Littig and Griessler, 2005). This argument has provided the basis of much academic research in this area. The traditional academic consensus is that sustainability should be seen through three pillars – or the triple bottom line of a business operation. These are economic development, environmental protection and social cohesion (Dillard et al., 2008, Jenkins and Yakovleva, 2006). The utilitarian principles are described as social progress that recognises the needs of everyone, effective protection of the environment, prudent use of natural resources, and maintenance of high and stable levels of economic growth and employment (*Ibid*).

In respect of the terminology utilised, a distinction should be made between ‘sustainability’ and ‘sustainable development’. In the current thesis, the former term is thought of as the ultimate aim for a corporation, for which a pathway of sustainable development is required. To that end, a sustainable society is one that has reached sustainability, at a given point of time, through the process of ecologically and economically sustainable development (Schaltegger and Burritt, 2006).

A similar analogy would apply to the sustainability (i.e., the lifetime) of companies. Accordingly, the concept of business sustainability follows the same logic; it follows that while businesses-oriented firms are made to generate economic profits and benefit the

economy as a whole, they should do so while meeting the interests of a firm's direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities, and so on), without compromising its ability to meet the interests of future stakeholders as well (Dyllick and Hockerts, 2002). Further to this point, Elkington believes that the triple bottom line model focuses on a firm's value added (or destroyed) in the context of social and environmental, as well as economic sustainability (2004).

The three pillars are inter-dependent and a number of their component aspects may be seen to overlap. For example, adherence to human and labour rights, and community and stakeholder management fall within the social pillar while they directly impact the economic performance of the firm (Chapter 6); while, environmental mismanagement may result in increasing insurance costs (increased risk of environmental exposure) and legal liabilities, both of which have a direct impact on the financial resources (i.e. the economic sustainability) of a company (Chapter 5).

Milton Friedman suggested in 1970 that "the social responsibility of business is to increase its profits" (Friedman, 1970). Even though many academics have challenged this notion, it seems that ultimately many large corporations have taken Friedman's school of thought to the core of their business strategy (Schaltegger and Burritt, 2006). When one examines the social and environmental scandals that large corporations have had to face in the past few years, one reaches the conclusion that short-term profit maximisation strategies have led company directors to take decisions resulting in said scandals. One recent example is that of BP's Deepwater Horizon Oil Spillage, in which the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling concluded that "overarching failures in management" caused the accidents which led to the oil spillage (OCS, 2011). It was made clear that a strategy of cutting costs had been pursued which led to jeopardising the due process and safety procedures.

Two case studies are compiled on companies whose aim is to play a progressive role in the global Business sustainability arena, such as Firm A, and those whose activities are affected by regulations aimed at sustainability such as Firm C. The thesis then looks at an industry in which Environmental Law has had little effect in preventing environmental mismanagement or community abuses by the firms therein. For this, the global Mining industry has been

examined while the analysis has focused on Rio Tinto Plc. The Chapters have been described in more detail in Chapter 2 where the Methodology used in this thesis has been described.

The author's interpretation of the concept of sustainability is unlike McKenzie's "smokescreen behind which business can continue its operations" as usual, since it emanates from the notion of a rule-based system. The rule-based system shown in Chapter 7 below, or any other variation of it which may later be developed independently by firms, is inherently internal to the firm and not for external use. Said framework is a decision-making tool and solely intended for the internal use of a given organisation. Thus, this framework is not intended for publication to stakeholders and thus cannot be used as a greenwashing tool (smokescreen). Reviewing the academic scholarship above has made it clear that the concept of sustainability is an ever-evolving notion and, thus, cannot be claimed as a state of affairs that an organisation has reached. Furthermore, the list of potential constituent factors which could affect sustainable development, across all areas of science and disciplines of social sciences, are so wide that it does not seem that any one person or entity could claim to have understood the subject area fully.

This wide latitude of potential factors has proved to be one of the main challenges of regulators in seeking to draft legislation towards sustainability in firms, and is also a limiting factor for conducting the current research project. It follows, therefore, that it can be asserted as one of the findings of the current thesis that the concept of sustainability cannot be defined in a conventional way using a set of fixed criteria and factors.

The current thesis propagates the notion that in ideal circumstances all three pillars of sustainability are treated with the same level of importance by firms. This is also the overall opinion of the experts who were surveyed as part of the validation efforts of this research. However, academic research has also been conducted which suggest that depending on the industries or the nature of the business, different priorities are given to each of the pillars (Pope et al., 2004, Slaper and Hall, 2011).

The research questions which are answered explicitly and implicitly⁵ throughout the thesis have also been described in Chapter 2. These are as follows:

1. Does the three pillar sustainability approach pertaining to corporate activity reduce corresponding risks?
2. Can a strict rule-based framework enhance sustainability of firms?
3. Can a sustainability rules-based framework help firms to reduce regulatory risks?
4. Can a framework of rules be designed to address key areas which would generally fit the needs of large and multinational firms?
5. If so, would all firms want to apply all the rules to the same extent?

Where reference is made to risk in the current research thesis, the risks associated with the following aspects of business operation are the subject matter of the relevant debate:

- Risks associated with climate change, which could affect several aspects of business operation;
- Risks associated with a change in the law as a result of climate change;
- Long term environmental risks as a result of historic environmental mismanagement (the same is valid by analogy in the case of human health);
- Risk of reputational damages as a result of ineffective stakeholder management;
- Other risks arising from a lack of foresight in managing a firm's strategic resources.

1.2.1. Association with Sustainability

One of the major implicit findings of this research thesis is that organisations tend to have a desire towards institutionalisation; this is in line with established organisational theory (Royston and Hinings, 1996, DiMaggio and Powell, 1991, Meyer and Rowan, 1977). Thus, organisational theory suggests that this tendency is due to market uncertainties in the long run; such that predicting the future of business climate is deemed extremely complex and somewhat impossible (Jones, 2013). As such, organisations tend to follow the precedent set

⁵ Some of these questions have been addressed directly throughout the thesis, such that by the end of the research it can be claimed that there is a specific answer to said questions. Others, however, have been addressed indirectly at different stages of this thesis and as such have been addressed implicitly. For example, questions 1, 2 and 4 have been addressed specifically as central parts of this thesis, whereas questions 3 and 5 have been addressed implicitly and in relation to the previous questions.

by their counterparts simply because said precedent has proved to be successful in previously similar circumstances (*Ibid*).

There are two strands of theory pertaining to institutionalism: the old and new institutionalism. The former deals with issues of influence, coalitions, and competing values, along with power and informal structures (Royston and Hinings, 1996, DiMaggio and Powell, 1991). The latter emphasises legitimacy, the embeddedness of organisational fields, and the centrality of classification, routines, scripts, and schema (Meyer and Rowan, 1977, Royston and Hinings, 1996). There have been new developments in this field such that the importance of systems, symbolic elements, regulatory processes, and governance systems are recognised by academics and researchers (Scott and Meyer, 1994). As such, it is somewhat clear that what is common between a group of organisations (in the context of institutionalisation) is that they seek to establish rules and abide by them (Hall and Taylor, 1996, Spangenberg et al., 2002).

Spangenberg et al. see the basis of sustainable development as one that requires deliberate decision making in order to “direct global development and system evolution towards a more sustainable route” (2002). Spangenberg et al. seek to test the effectiveness of the *indicators* of sustainable development as introduced by Agenda 21 of the *Rio Conference on Environment and Development* using institutional theory. The primary focus of their research is on political institutions with a short hint at corporate institutions and individuals. They conclude that competing indicator systems could be developed and tested for their practical efficacy (*Ibid*). Thus, there is clear indication that sustainable development has been brought into the realm of institutionalisation theory, but there is far less evidence of the two disciplines being analysed concurrently and developed into a concrete hypothesis or an autonomous theory.

As such, from the perspective of organisational theory, this thesis assumes that firms view the notion of corporate sustainability as an institutionalised ideology which contains rules and procedures. This is useful to the author as this institutional perspective lends credence to the view that sustainability should be implemented through a rule-based system. On this point, the main methodology used to conduct the current research project is to use case studies to flesh out at least some of the constituent elements of a rule-based system for implementing sustainability. The rules-based system in Chapter 7, which draws from the findings of its preceding Chapters, also aims to reflect this trend toward institutionalisation. Finally, the

absence of such a rules-based system is thought to be a major contributing factor to the confusion which has been witnessed among corporate strategists and regulators in respect of how best to implement sustainability.

2

METHODOLOGY

Chapter 2: Methodology

2.1. Starting Premise

The starting premise of this research project was that operational risks are significantly reduced in the case where a firm's corporate strategies contain rules and procedures pertaining to relevant business scenarios. As such, firms which benefit from an internal set of rules and procedures are likely to be more successful in the long run compared to those firms in which this culture does not exist. In this regard, a brief comparison between two large firms in the international oil and gas sector is insightful; these are Firm C and British Petroleum.

The overarching corporate strategy of Firm C is to conduct every aspect of their business operations in accordance with a "zero risk" strategy (Schurmans, 2011). This strategy is enshrined in operational aspects of the firm's activities as well as corporate and financial aspects (*Ibid*). This tendency is also apparent in their desire to formulate a rules-based system

in order to understand the legal mechanism pertaining to waste management in the EU (see Chapter 5). Furthermore, it is stipulated that this corporate culture has led to a near perfect record in terms of prevention of accidents with wide adverse environmental consequences (Schurmans, 2011). For example, in the past 20 years or so (since early 1990's), Firm C has not been involved in any major accidents with adverse consequences on the environment or human health throughout their European operations (Skjærseth, 2003).

On the other hand, in the case of British Petroleum (henceforth referred to as BP), the case is somewhat different. In 2010 an explosion occurred on the Deepwater Horizon oil rig, which at the time was operated by BP (Thomas, 2010). This accidental explosion led to devastating environmental damage and adversely affected the livelihoods of communities in the Gulf of Mexico, Florida (*Ibid*). The firm has faced numerous lawsuits since then at total costs far exceeding the originally expected US\$7.8 billion (Crooks, 2013a). The National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (OSC) which was set up by the United States federal Government administration found that said explosion was due to systemic and overarching failures in management with a sense of dismissal of health and safety rules (OCS, 2011, Shankleman, 2011). It is noteworthy that industry experts at Imperial College London had warned of these failures and the lack of adherence to rules and procedure at BP in the years preceding said accident.

It is noteworthy that this thesis has not made the definitive conclusion that corporate strategies which are deemed to meet the criteria of sustainable development will lead to long term economic profitability of the firm. Rather, it has merely found a correlation to that effect. This correlation has been shown explicitly in Chapters 4 and partially 6, and implicitly in Chapters 3, 5 and, again partially 6. In Chapters 4 and 6 the positive effects of environmental and socially sustainable business conduct has been demonstrated. In Chapters 3, 5 and 6 (partially), the potential and actual negative effects of unsustainable corporate strategies are also shown. These Chapters are all fully integrated in spite of their apparent differences: the combination of negative effects on firms as a result of unsustainable activities, together with positive effects of sustainable activities shows this correlation.

Observing the different business approaches adopted by Firm C and BP (and their respective consequences), together with the findings of the following Chapters led the author in the direction of rules-based systems. Thus, the findings of each Chapter were formalised into a

set of rules, which together form the framework in Chapter 7. Furthermore, it is stipulated that incorporation of these rules into law would ultimately benefit the whole of the economy by providing a sound legal basis for a sustainable economy. Naturally, the scope for expansion of this research is vast; this issue is discussed in Chapter 8.

2.1.1. Thesis Aim

One aim of this thesis is to formulate a rules-based system which will be beneficial to regulators, firms and stakeholders of private enterprises. Regulators will be able to utilise this rules-based system as an aid to drafting regulations aimed at an aspect of sustainability, whereas firms will be able to examine said system in order to address the areas in which the firm's sustainability strategy faces shortcomings; finally, it is hoped that this rules-based system will be beneficial to corporate stakeholders for the appraisal of said firms' sustainability strategies, and whether or not the firm in question has dealt with all the desired sustainability measures adequately.

The challenge of sustainable development, as defined by the United Nations, is multi-dimensional and as such does not entail an exhaustive list of constituent factors. Indeed, there are many elements within a firm's business strategy which are aimed at short term profiteering as opposed to long term sustainable growth; however, these "*unsustainable*" actions are not shared between all business sectors and firms. Equally, the solutions to such unsustainable corporate strategies are not the same across all businesses. It is, therefore, submitted that a *silver bullet* does not exist in the debate surrounding business sustainability and that each firm is required to compose a unique sustainability strategy based on its current circumstances.

2.2. Research Outline

A graphic illustration of the layout of this research thesis (and the methodology employed) has been created below (figure 1). The flow chart demonstrates the main research body of the thesis and is drawn for sake of clarity for the readers.

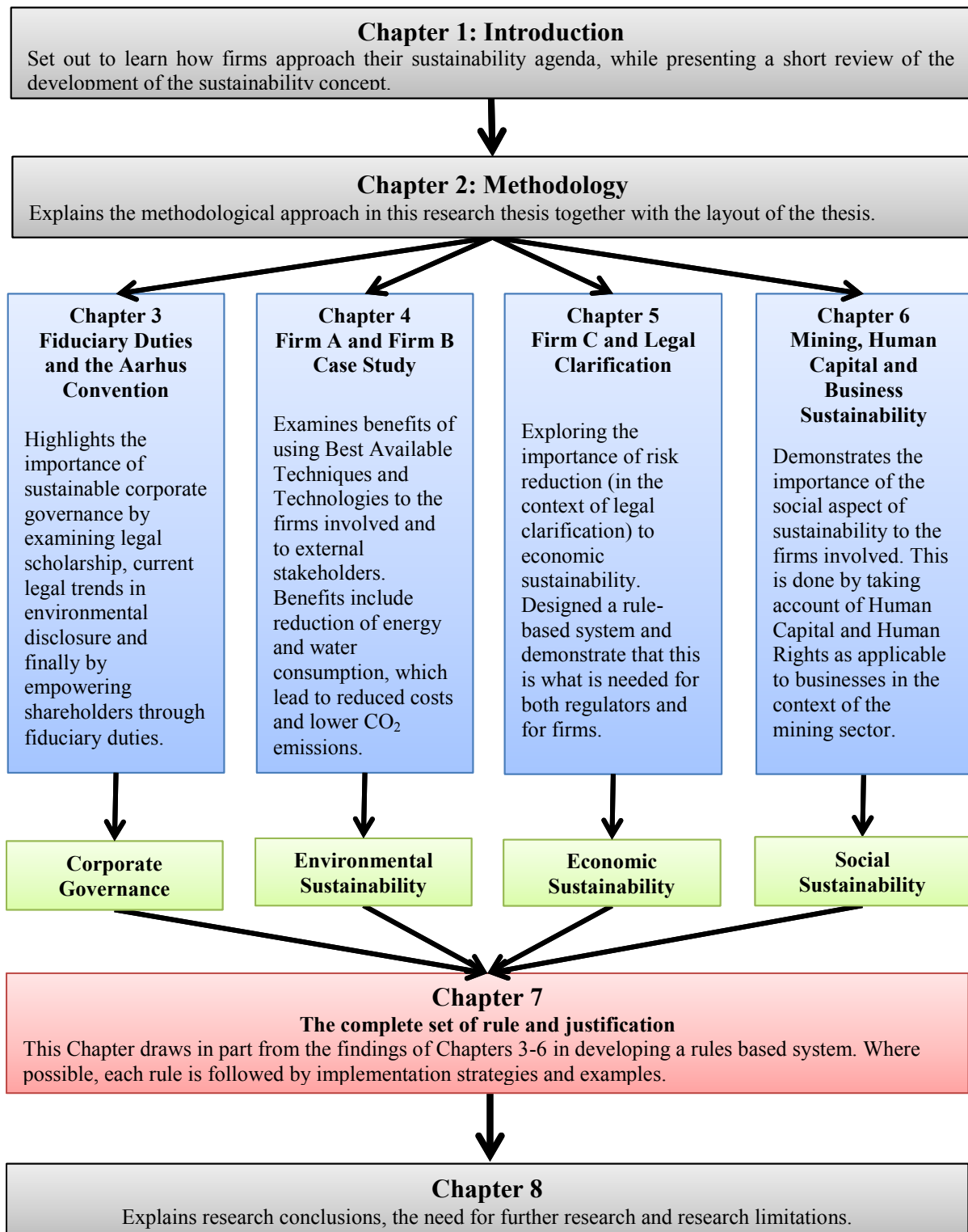


Figure 1: The outline of the methodology for the current thesis

Figure 1 shows that the Introduction and Methodology Chapters provide the theoretical basis for this research thesis, while Chapters 3 to 6 provide a parallel industrial and academic examination of the requirements for corporate sustainability in each of the issues in question.

They explore some key areas of sustainability as a rule-based system in detail. Chapter 7 will then draw the findings of these parallel Chapters together to create a comprehensive set of rules pertaining to corporate sustainability. The rest of this subsection will explain each substantive Chapter in more detail. Thus, the main four chapters (3-6) of the current research body will be explained briefly followed by the findings therein. Finally, Chapter 7 will be explained briefly in order to demonstrate the main findings of this research and the way in which it makes an original contribution to knowledge.

Chapter 3 is the Chapter with which the main research body of this thesis begins. The Chapter seeks to highlight the importance of corporate governance in the context of business sustainability. This has been done by, firstly, establishing that the availability of environmental information is an essential tool for risk management as far as institutional shareholders and other main stakeholders of said firm are concerned. Examples have been provided in this Chapter and throughout the thesis to show the severity of damage caused to investors as a result of withholding such information from shareholders. The current UK and international regulations and case law regarding the disclosure of environmental information by corporations are examined subsequently, and their respective deficiencies are exposed. The Aarhus Convention has then been explained and analysed extensively and used as an appropriate benchmark for the availability of environmental information and for any subsequent legal drafting to be based upon it. Furthermore, the Chapter discusses the availability of fiduciary duties as a device available to shareholders for invoking their rights to said environmental information by the company⁶. The critique within this Chapter together with evidence of good practice, provide the basis for the rules in Chapter 7.

An industrial case study has been chosen as the focus of Chapter 4. This Chapter explores the benefits of technology sharing and innovative sustainable solutions to business operations and the agenda of environmental protection. The in-depth analysis benefits from a close collaboration and information sharing by Firm A in France. This company shared private corporate information with Imperial College London so that the latter party would publish the current Chapter as an internal document used for promotional activities. As such, the Chapter benefits from a great deal of technological insight and analysis, together with real data in

⁶ This Chapter was also published in the journal of European Energy and Environmental Law Review in February 2011 as a journal article.

relation to the change in water consumption, carbon dioxide emission and energy generation after the installation of said technologies. It follows that the style of this Chapter is somewhat unconventional compared to the rest of the thesis; it provides a quantitative analysis of the benefits gained from adopting a sustainability-based business strategy and investing in new technologies to that effect. As such, the case for environmental sustainability within this Chapter is highlighted with the aid of an industrial based case study, while demonstrating that such integrated solutions are beneficial to the two corporate/industrial parties involved. This Chapter provides in-depth insights into the economic benefits of environmental sustainability for the firm in question, and indeed for external stakeholders. These are seen as evidence of industrial good practice and have been used to draw the rules pertaining to environmental sustainability within Chapter 7.

In Chapter 5 the case of Firm C's struggle with ambiguous regulatory drafting is examined. The regulation in question is Directive 2008/98/EC, the so called Waste Framework Directive. The aim of this Directive is to facilitate waste regulations for businesses through the creation of a new category of substances, namely by-products (European Commission, 2012). However, the ambiguities within the Directive led to further confusion instead of the facilitation of waste management. Thus, directors of Firm C were uncertain about the status of a number of substances which were produced at their manufacturing plants and refineries, and for which a market existed (evidenced by existing market demand), but which would still seem to fit within the definition of waste. If that interpretation were true, then Firm C's insurance costs would have risen as a result of increased risk (for waste transportation and handling) and the firm would have been required to transport waste with special couriers. The Chapter seeks to clarify the law in relation to this categorisation, and in doing so proves that the substances in question would fit within the definition of by-product and as such would eliminate the need for increased haulier-related insurance costs. The objective of conducting such complex legal analysis is to demonstrate the extent to which regulatory ambiguities adversely affect businesses in the context of risk management and its direct negative impact on economic sustainability. In the spirit of the final conclusion of this thesis, Chapter 5 ends with a framework (similar to a rule-based system) which was created for the proper classification of substances into Waste, Product or By-product categories. This rule-based system is utilised by Firm C as a method for determining the status of the outputs of their manufacturing sites, and thereby improving the firm's overall business sustainability agenda.

The desire to comply with a set of rules (as demanded by Firm C) is, again, taken as evidence of good practice in designing rules pertaining to economic sustainability within Chapter 7. Our learning from the case example of BP, where abundant lack of adherence to internal safety and operational rules and overlooking governance mechanisms led to severe adverse environmental, social and economic consequences, is used as evidence for the necessity of a rules-based system. Furthermore, this Chapter amplifies the responsibility of states and regulators to draft unambiguous legislation which will help to increase market efficiencies. Using the rules-based framework in Chapter 5 in relation to waste and the one in Chapter 7 in relation to the overall sustainability of a firm would help regulators in achieving this objective.

Chapter 6 focuses on the Social aspect of business sustainability and its importance to the overarching sustainability agenda of firms. In doing so, a labour-intensive industry has been chosen in which the effects of the business operations of firms have significant effects on their employees (due to hazardous working conditions) and on the societies in which those firms operate (due to loss of land, movement of people and lasting environmental damages); this is the international mining industry. In order to do so, the focus of this Chapter is twofold. In the former section, attention is given to the concept of Human Capital as it applies to mining firms internationally. The real value of human capital is then explored and the importance of it to business sustainability has been highlighted. The latter section of this Chapter focuses on one firm in particular, namely Rio Tinto, and explores the factors which have affected the social reputation of this firm using a framework called RepRisk. Furthermore, the frameworks used by the Global Reporting Initiative (from which the basis of the current research stems) and RepRisk are compared and contrasted in relation to one another. Suggestions for improvement in the field of sustainability reporting follow this analysis. The findings of this Chapter lead to social sustainability rules and principles which appear in the final section of Chapter 7.

Finally, Chapter 7 draws in part from the findings of its preceding Chapters in areas of Sustainable Corporate Governance, Environmental Sustainability, Economic Sustainability and Social Sustainability in order to produce a fully integrated rule-based framework. The rules are separated in their respective categories and amount to 31 rules. Examples of good practice (or the lack thereof) have been provided in order to demonstrate how they can be applied in a different scenario for firms with different circumstances. The objective of these

rules is to enable corporate strategists and regulators to draft accurate and applicable corporate sustainability strategies and legislation respectively. These rules will provide a blueprint for drafting said documents which, if implemented, will set the entity to which the rules are subjected on a path of sustainable growth. It is noted that the limitations of this PhD thesis do not afford the time and space for a detailed analysis and elucidation of all the rules contained in Chapter 7.

2.3. Research Questions

The overarching question that this thesis seeks to address is whether following a set of dynamic rules pertaining to governance, environmental, economic and social sustainability can reduce operational and financial risks to firms, which would ultimately ensure mitigation of risk in the future. It has been shown throughout the current thesis that this seems to be true. Moreover, many examples have been provided where overlooking established rules pertaining to social, environmental or economic affairs, has led to significantly increased risks and ultimately grave financial consequences.

As suggested earlier, the issues surrounding the concept of sustainability are innumerable and extremely complex; the list of factors affecting sustainability as a whole is non-exhaustive. As such, the list of regulations dealing with such issues globally will be as vast as the issues themselves. At the same time, it is unfounded that a one-size-fits-all approach to corporate sustainability will be beneficial to a company or a community. Therefore, to identify every aspect of business sustainability within every firm and every manufacturer is deemed far-reaching and beyond the ambit of the current research thesis. As such, a number of aspects of business sustainability within the four categories stated have been identified and examined in four Chapters. To that end, the research questions which this thesis addresses are as follows:

1. **Does the three pillar sustainability approach pertaining to corporate activity reduce corresponding risks?** This question is posed in reference to numerous environmental and financial crises in the recent past, for which corporations have been largely blamed. On the other hand, in the past half-century academics and other stakeholders have sought to contribute to the development of the theories surrounding sustainability, which have been posed as the solution to such man-made environmental catastrophes. Perhaps, therefore, it is time to re-examine these theories in terms of their efficacy.

2. **Can a strict rule-based framework enhance sustainability of firms?** If it is found that the current sustainability theories provide a solution to the reduction of operational business risks, then what are the steps which firms should take in order to achieve this objective? It is thought that the constituent issues of the pillars of sustainability are somewhat vague, which has led to further confusion in the market and among institutional investors. Once these constituent issues are clarified, then what framework should be followed by firms in applying them? It is found through the literature review and industry practice that a rules-based framework is desired in order to reduce risks associated with operational matters.
3. **Can a sustainability rules-based framework help firms to reduce regulatory risks?** Much of the risks posed to firms are those posed by changing environmental regulations. This risk is exacerbated where legislation is unclear or where it does not adequately address the concerns raised by the industries which it seeks to address.
4. **Can a framework of rules be designed to address key areas which would generally fit the needs of large and multinational firms?** Firms in different industrial sectors have differing requirements and face separate challenges. To that end, it is questionable whether a ubiquitous framework could be designed to address the sustainability challenges and requirements of all firms.
5. **If so, would all firms want to apply all the rules to the same extent?** It is important to decide whether said framework and the rules therein should be strictly applied by all firms. It seems unlikely that one framework would be sufficiently comprehensive so that all commercial enterprises would benefit from its rules. For example, it is difficult to justify why banks or other financial institutions should be aware of water scarcity as part of the firm's sustainability agenda (in respect of their on-site operations; although such rules might influence how they regulate clients to whom they lend money along the lines of the Equator Principles (2013)); whilst this rule would be of paramount importance to firms which operate water intensive manufacturing plants.

All of these questions are addressed throughout this thesis. Some are responded to explicitly and others addressed implicitly.

2.4. Definitions of Frequently Used Terms

Numerous terms have been used throughout the thesis in order to describe a relationship, a phenomenon, a legal formation, or a process. These are all terms which are commonly used

in business, management and legal scholarship. Defining these terms from the outset will help the reader in contextualising them throughout the thesis. Nevertheless, there will be concepts whose definitions have been deemed to be unclear or non-existent; in such cases a definition has been created which is derived from the definitions of existing concepts within said discipline. Terms which are not pivotal to the current thesis are defined where they first appear. Table 2 below shows the definitions of the terms commonly used within this thesis.

Term	Definition
Corporate Governance	A <i>Code</i> concerning the mechanism of a company from the board of directors to the employees, and how the values of said firm are established, implemented and incorporated throughout the hierarchal layers of management. It is to be distinguished from the day-to-day operations of the firm and its strategic business decisions. See section 3.1.
Environment	Aarhus Convention 2(1): the state of the elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites including wetlands, coastal and marine areas, biological diversity and its components, including genetically modified organisms, and the interaction among these elements. See section 3.7.
Fiduciary Duties	Someone who acts for or on behalf of, another person, in a relationship of trust and confidence, which equity protects by imposing on the fiduciary a duty of loyalty. See section 3.1.
Stakeholders	Any group or individual who can affect or is affected by the achievements of an organisation's purpose. See Chapter 1.
Sustainability	Derived from the definition of Sustainable Development by the United Nations: "development which meets the needs of the present without compromising the ability of future generations to meet their own needs". See Chapter 1.
Business Sustainability	Follows the same logic as Sustainable Development, such that while businesses are made to generate economic profits and benefit the economy as a whole, they should do so in light of the need for future generations to be able to utilise the same resources to meet their own interests. See Chapter 1.
Waste	Any substance or object which the holder discards or intends or is required to discard, as per Waste Framework Directive (Directive 2008/98/EC). See section 5.4.

Table 2: Terms commonly used within the current thesis and their associated definitions

2.5. Literature Review

Researchers typically conduct a *literature review* in order to solidify their understanding of their relevant subject area and to expand their knowledge base. A literature review also aims

to identify the current trend of academic thought in the relevant area of research. Furthermore, a literature review should highlight shortcomings within the topic area to identify possible conflicts between theories. Naturally, if the subject area which is being researched is a hybrid of a few disciplines, which ordinarily seem disparate, conducting a unified literature review will be ineffective in conveying the previous research conducted in one discipline. This is due to the difference in the bodies of knowledge, difference in the styles of research and difference in the problem areas within each discipline.

The current research thesis is one such example, namely where at least two seemingly disparate academic disciplines are being examined. Thus, it was decided from the inception of the current project that Chapters 3-6 will benefit from autonomous sections of literature review, which would be fully integrated with the body of research being examined. It is stipulated that this style would allow the reader to engage with the existing literature whilst understanding the challenges presented by the research thesis. Thus, the literature review within the current research thesis has been conducted in a somewhat unconventional fashion.

2.6. The Methodological Approach

It is becoming increasingly popular among researchers to use case studies for tackling research questions and test theories (Hillebrand et al., 2001). Case studies are expected to demonstrate the complexity of a single case and are used as the core of many research projects in social sciences (Noor, 2008, Johansson, 2003, Yin, 2011). The case study approach is also widely used in practice oriented fields of research such as environmental studies, business studies and education research (Johansson, 2003). The principal research method of the current thesis is also based on conducting case studies on a number of industries and / or industrial actors. One of the main benefits of adopting a case study methodology is that by nature, this research method has been designed to bridge the gap between methods used in Hermeneutics and Positivism schools of thought through combining qualitative and quantitative methods (Johansson, 2003).

As suggested by the title of the current research project, the research body conducted herewith is inter-disciplinary in nature and thus requires an innovative research method. As suggested by Patton, a *paradigm of choices* has been adopted when choosing the case studies in this thesis; thus, a “paradigm of choices rejects methodological orthodoxy in favour of

methodological appropriateness as the primary criterion for judging methodological quality” (Patton, 1990: 39).

The exact meaning of a case study is a subject of much debate among academics (Merriam, 1991, Anderson, 1998, Johansson, 2003). Yin defines cases as “a bounded entity (a person, organisation, behavioural condition, event or other social phenomenon), but the boundary between the case and its contextual conditions –in both spatial and temporal dimensions– may be blurred” (2011). Anderson states that a case study is a “holistic research method which uses multiple sources of evidence to analyse or evaluate a specific phenomenon or instance”, and that they tend to be interpretive and occur in natural settings (1998). Furthermore, case studies are not intended to examine all aspects of a given organisation, but rather to focus on a particular subject, feature or unit of analysis (Noor, 2008). The current research thesis accommodates this view by examining one aspect of sustainability during each case study.

It seems that the possibility of using a multitude of methods for conducting case study research is an aspect that academics agree upon (Johansson, 2003). Groat and Wang’s diagram in their book *Architectural Research Methods* refers to this notion (2002). Figure 1 depicts a simplified version of this diagram as drawn by Johansson, while explaining that qualitative and interpretive methods are similar to the extent that they both benefit from a holistic approach to the research question; but they are different in their time perspectives.

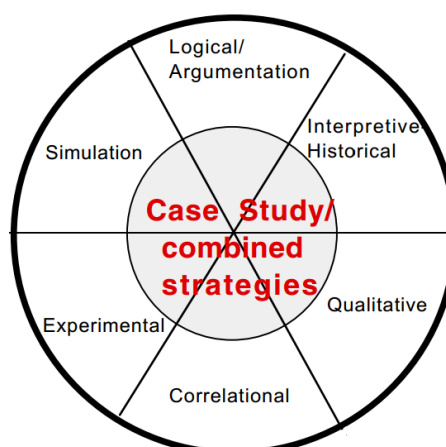


Figure 2: Groat and Wang's diagram of conceptual framework for research methods, as simplified by Johansson (2002, 2003)

On the other hand, correlational research is similar to qualitative research methods in that they both focus on naturally occurring phenomena, while the latter is dependent on quantitative data. Experimentation is similar to correlation research methods in this regard. Though, experimentation, like simulation, requires the ability to manipulate isolated factors (Johansson, 2003).

It follows that since the current thesis is based on the two disciplines of business research and legal studies (broadly, corporate sustainability and environmental law), a case study methodology was deemed most appropriate. Furthermore, one main objective of this research thesis is that its findings will be useful for industrial actors, including corporations and regulators. As such, the current thesis comprises four case studies, where each case study will act as a sub-set of the thesis, which will merge in the end in order to conclude the thesis. Each case study reflects on a specific aspect of an organisation or an industrial sector in order to shed light on the importance of an individual pillar of sustainability, while demonstrating the interdependence of the three pillars.

For the purposes of the current research, it is submitted that Corporate Governance should be added to the three incumbent pillars of business sustainability, namely Environmental, Economic and Social sustainability. This thesis will commence with examining the importance of corporate governance to corporate sustainability and will demonstrate the interdependence of the four pillars of sustainability to one another.

2.6.1. Generalisation in Case Studies

Generalisation made as a result of conducting case studies is the most common cause for questioning the validity of case studies (Johansson, 2003, Hillebrand et al., 2001). It has been suggested that in case study research external validation of the findings of the case study are most problematic (Hillebrand et al., 2001, Yin, 2003). The issues surrounding generalisability of the results of a case study arise when a researcher purports to investigate whether their theories/hypotheses are valid in reality – i.e. whether if theory is supported by empirical facts (Hillebrand et al., 2001).

For example, assume a researcher would like to learn the correlation between implementation of sustainability strategies within firms and said firms' long-term increasing profitability; in doing so, it will be close to impossible to examine the effect of every investment activity

within said corporation on reaching its sustainability goals. Thus, the researcher should know whether or not their findings can be extrapolated to represent the status of the whole industry or sector. The same questions arise where case studies are conducted within the current research thesis. For example, in Chapter 7 (introducing the rules-based system), while the rules are broadly based on the findings of the preceding Chapters, additional research has taken place to some extent in deriving some of the other rules. This is mainly because the case studies in Chapters 3-6 are focused upon a certain narrowly defined issue or problem in the broader realm of sustainability. For example, the Chapter examining the benefits of environmentally sustainable corporate strategies is restricted to waste water management and does not explicitly deal with other environmental aspects.

Generalisations are based on three main modes of reasoning, namely deductive, inductive and abductive. According to Johansson, case study generalisations can be made using any of these principles or a combination of them. Generalisations based on the deductive principle are those which are similar to conducting an experiment such that testable consequences are derived by deduction subsequent to the formulation of a hypothesis (Johansson, 2003). Inductive methods of generalisation, however, are those where a theory is systematically generated from data, such that said theory will consist of a set of related concepts (Dubois and Gadde, 2002, Johansson, 2003).

Finally, abductive research, according to Dubois and Gadde, is more than a mere amalgamation of the deductive and inductive methods (2002); rather, it is a method used when the researcher is looking to discover completely new theories as a result of conducting their case studies, as opposed to testing the validity of existing theories. As such, the original framework of the research is successively amended and the researcher will find new insights into the topic as well as finding unanticipated empirical evidence (Dubois and Gadde, 2002). Abduction is, therefore, the process of “facing an unexpected fact, applying some rule (known already or created for the occasion), and, as a result, positing a case that *may be*” (Johansson, 2003). Therefore as suggested by Dubois and Gadde, this approach creates a “fruitful cross-fertilization where new combinations are developed through a mixture of established theoretical models and new concepts derived from the confrontation with reality” (2002). After a close examination of the deductive, inductive and abductive generalisation and / or reasoning methods, it is stipulated that the current thesis follows the abductive

methodology. Figure 2 below is the author's illustration of the three abovementioned methods of generalisation of case study research.

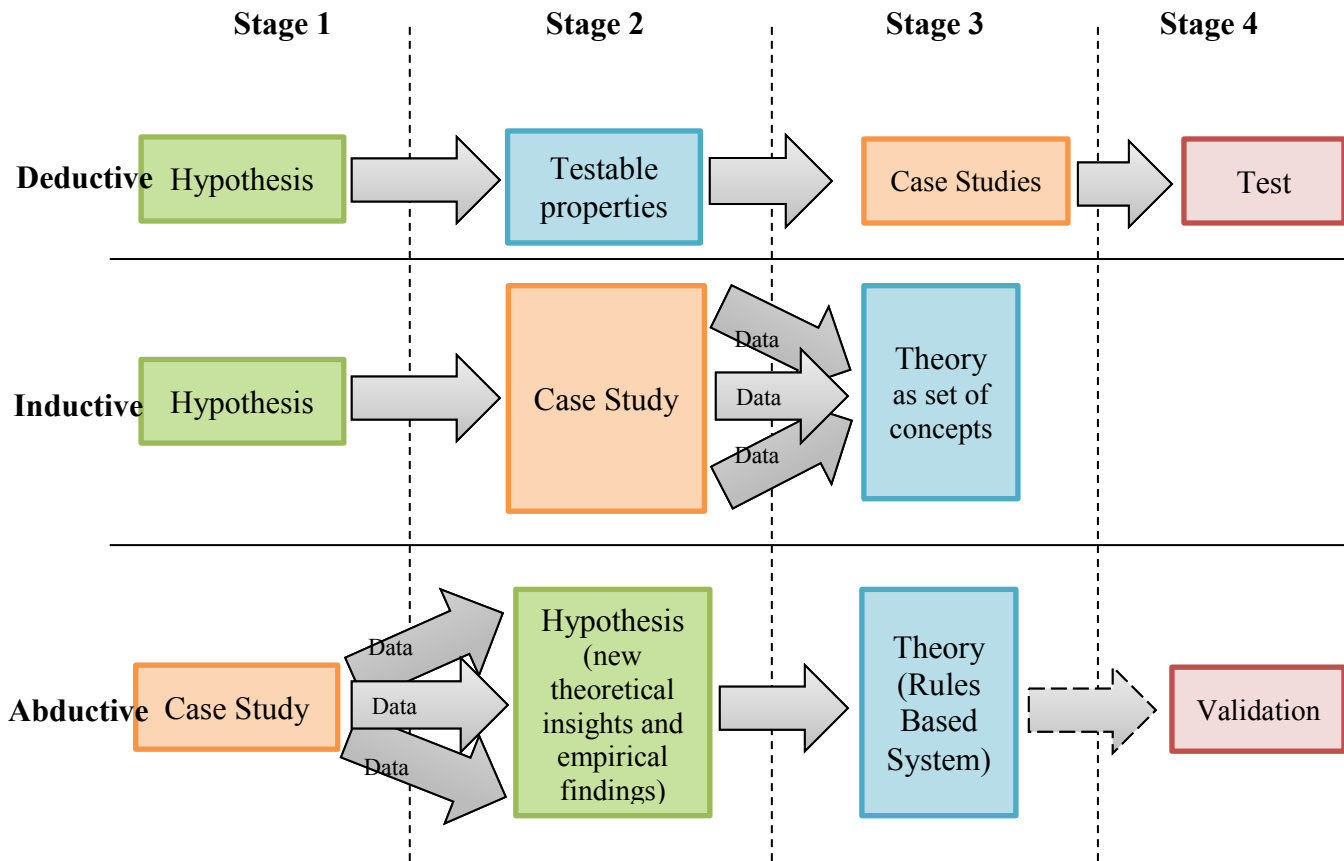


Figure 3: Author's illustration and comparison between of Deductive, Inductive, and Abductive research methods

Stage four has only been referred to in the literature in the case of Deductive research; though, a fourth stage has been added in the case of the Abductive method, since the current thesis has sought to validate and verify the findings of Chapters 3-6 using expert knowledge which has been gathered by way of a survey (see Chapter 7).

2.7. Validation of Findings

A process of validation of the findings of this thesis has been chosen in order to ascertain their accuracy and indeed their applicability to stakeholders and industrial actors outside of the academic world.

As such, a survey was designed and key stakeholders were approached. Chapter 7 is partially dedicated to explaining the findings of said survey and whether if the findings of the current research were verified or not as a result of conducting the survey. The respondents were chosen based on their expertise, experience and occupation in the area of this research. Each respondent is assumed to represent the predominant line of thinking within a relevant group (i.e. entity, organisation, social movement). The survey contains 10 questions where the respondents answer questions based on their personal interpretations of the relevant question (i.e. some questions have been deliberately left open to interpretation and the definition of technical terms, such as “sustainability” have been omitted in order to invoke the line of thinking of the respondents). All the questionnaire responses are listed in Appendix VII.

The latter part of Chapter 7 provides an analysis which is derived from the case studies in the preceding Chapters and introduces the main finding of this thesis. In the next Chapter the importance of an appropriate governance structure to a successful implementation of sustainability strategies is discussed.

3

CORPORATE GOVERNANCE

Chapter 3: Legal Guidance on Access to Corporate Environmental Information

3.1. Introduction

The aim of this Chapter is to highlight the importance of informational (non-)disclosure as a key aspect of Corporate Governance. This Chapter focuses on Corporate Governance in the form of adequate disclosure of environmental information as a means of adhering to sustainability criteria and thus facilitating sustainable development led by corporations. In the UK, the first Corporate Governance Code was drafted in 1992 by the Cadbury Committee (FRC, 2012). The definition of Corporate Governance was provided in paragraph 2.5 of that report as:

“Corporate governance is the system by which companies are directed and controlled. Boards of directors are responsible for the governance of their companies. The shareholders’ role in governance is to appoint the directors and the auditors and to

satisfy themselves that an appropriate governance structure is in place. The responsibilities of the board include setting the company's strategic aims, providing the leadership to put them into effect, supervising the management of the business and reporting to shareholders on their stewardship. The board's actions are subject to laws, regulations and the shareholders in general meeting."

From a broad perspective, it could be said that Corporate Governance comprises a system of laws, rules, and other factors that control operations at a company (Gillan and Starks, 1998). Furthermore, Gillan argues that research in corporate governance falls into one of three broad categories: performance as a function of governance, governance as a function of governance, and increasingly, the impact of governance on performance (Gillan, 2006).

Essentially, therefore, the concept is regarding the mechanism of a company from the board of directors to the employees, and how the values of said firm are established, implemented and incorporated throughout the hierarchal layers of management; therefore it is to be distinguished from the daily operations of the firm and its strategic business decisions. Generally, corporate governance merely focuses on internal mechanisms and on disclosure and transparency with an eye to the suppliers of finance in the first place (Kolk, 2008). This is not to say that stakeholders are completely overlooked in the traditional aspects of corporate governance, as for example, employees play a central role in corporate governance as internal stakeholders.

This Chapter reflects the great importance of transparency and reporting within an institutional governance context. One of the main reasons for the emphasis on corporate environmental disclosure is the ever-increasing demand by institutional shareholders for increasing transparency within firms. It is shown in this Chapter that increasing transparency will in turn provide legal cause to said shareholders to influence the overall directions of the firm more effectively.

Thus, corporate governance is an autonomous discipline of study and its scope can be the subject of a PhD thesis in its entirety. Therefore, only one aspect of corporate governance has been examined in this Chapter, namely the adequate disclosure of information pertaining to the risks posed to the firm as a result of its business operations. This is so despite the UK Corporate Governance Code's (CGC) emphasis on Disclosure and Transparency rules (FRC,

2012, Schedule B). However, the CGC does not focus at all on the risk posed to firms due to climate change or environmental risks as a result of their operations, whilst there is clear demand from stakeholders and institutional shareholders for such information (Kolk, 2008). This is one of the major areas in which the CGC has failed to establish a standard.

It is submitted in this Chapter that, in fact, adequate disclosure of environmental information is of crucial importance to shareholders (particularly institutional shareholders) and other stakeholders. This was the basis for the creation of Climate Risk Disclosure Initiative in 2005 by leading investors and other organisations worldwide; the objective of this initiative was to improve corporate disclosure of the risks and opportunities posed by global climate change (CRDI, 2006).

In addition, it is the submission of the author that a firm will not be able to truly and effectively adopt sustainability values unless this adoption starts from the top of the power hierarchy of said firm. In order to do so, the firm's governance structure should be amended in order to incorporate corporate sustainability values. A "chain of accountability stretching from the boardroom to the factory floor or farm" should be created in order to fully and effectively embed the importance of sustainable business performance within an organisation (Ceres, 2013a). Different aspects of this submission are explained in detail in Chapter 7 as part of the rules pertaining to sustainable corporate governance (rules 1.2, 1.3, 1.4, 1.6 and perhaps even 1.7). Once this culture is embedded within an organisation and appropriate sustainability training is incorporated within the long term strategy of a firm (see rules 4.2, 4.4, and 4.6), such learning advantages can be disseminated from the bottom of the hierarchy to the top. Benefits of a bottom-up dissemination of "learning" could include insightful understanding of customer investor and market requirements.

It is, therefore, suggested that disclosure of environmental information should not only be included in the CGC, but should in fact be a strict requirement. This is the underlying argument of this Chapter, which will be presented through an examination of the legal basis of such demands by stakeholders (especially institutional shareholders). These rights include shareholder rights in relation to Directors' duties and the rights of access to environmental information in the Aarhus Convention. In doing so, the extent to which corporations are bound by regulation in different jurisdictions will be examined. This will be followed by examining the strength and utility of fiduciary duties in favour of shareholders in order to

require the desired extent of environmental information. Existing legislation in the UK, European Union, United States of America and other jurisdictions will also be examined in order to widen the latitude of this study.

3.1.1. Introduction to Company Law *vis-à-vis* Disclosure

Public companies owe certain duties to their shareholders. These duties largely relate to the disclosure of information at times when important decisions are made about the course of action the company adopts. In such cases the course of action is usually chosen by the majority of shareholders in general meetings (French et al., 2008). Therefore, the extent of the information revealed to shareholders, and indeed the accuracy thereof is of significant importance since it influences the way in which shareholders cast their votes.

Company law is generally said to be shareholder-centred or based on the principle of Shareholder Primacy (i.e., the realisation of shareholder value) (French et al., 2008, p. 31). Shareholders elect the directors through resolutions in general meetings and can remove them by a simple resolution according to s.168 Companies Act 2006⁷. Directors are responsible for leading the company in a direction in line with the principal objectives of the shareholders. The majority of the shareholders therefore rule companies indirectly; it follows that, should the majority of the shareholders disapprove of directors' future plans for the company, the company will have to amend its course. Majority shareholders, acting on behalf of the company have the power to sue the directors of the company for a breach of duty, since duties are owed to the company not to individual shareholders (*Ibid*, p. 458). This also applies to minority shareholders who may petition the court should they believe an action of the directors has been unfairly prejudicial towards them (*Ibid*, p. 536).

As such, the only group of persons who have the potential power to control the directors of a firm (and thereby the direction of a firm) are said firm's members. However, as stated in the ground-breaking work by Berle and Means, it is unrealistic to argue that shareholders have any real control over the day-to-day running of a firm, or indeed even in the overarching principles (Berle and Means, 1932). This may well be true today in the case of normal individual shareholders who passively contribute capital; however with the rise of large

⁷ Unless otherwise stated, the case law or legislation referred to in this Chapter is that of England and Wales.

institutional shareholders the issue of directors' duties and the enforcement mechanisms are becoming ever more important (French et al., 2008, p. 410).

Directors' duties are owed not by the company itself but by the directors of the company to the company. These duties are in the form of fiduciary duties, which refer to 'trust and confidence', and are derived through a relationship of trust (*Bristol and West Building Society v. Mothew* (1998a) and *Arklow Investment Ltd v. Maclean* (2000b)). As such a fiduciary is "someone who acts for or on behalf of, another person, in a relationship of trust and confidence, which equity protects by imposing on the fiduciary a duty of loyalty" (French et al., 2008). However it is noteworthy that the law distinguishes between directors of a company and trustees of a trust. Under the terms of a trust, the trustee holds the legal title of an asset for the benefit of the beneficiary, whereas in company law the director is merely chosen and thus trusted by the shareholders to drive the company toward the shareholders' shared objective (Martin, 2005).

Nevertheless directors are treated as fiduciaries insofar as they hold the legal title of properties of a company in favour of the beneficiaries and control those assets (but do not own them), and are disallowed from making a personal profit by virtue of their office, save in cases where the articles of the company specifically provide for such profits (by virtue of *Regal (Hastings) v. Gulliver* (1942))⁸. It is commonly thought that every relationship between an agent and his principal is that of a fiduciary whereas this assertion, albeit common, is not always correct. Fiduciary relationships exist in many situations such as solicitors, company directors, partners, confidential employees, certain bailees and pawnbrokers. The current focus is the fiduciary relationship between company directors and the owners of the company, namely the shareholders, with regards the company's non-financial reporting, particularly environmental disclosure.

⁸ The House of Lords ruled that directors made personal profits from using their personal funds, while they were made aware of the particular opportunity through virtue of their positions as directors. This kind of profit had not been provided for in the articles of the company and the directors were ordered to reimburse the company with the profits.

As this Chapter is significantly focused upon corporate environmental disclosure, attention is called to the Aarhus Convention⁹, which was adopted by the United Nations Economic Commission for Europe in 1998 (UNECE, 2011). Various references to the Convention, its underlying principles and their implementation in the European Union, including her Member States are seen as important in this context given that the Aarhus Convention is authoritative in relation to what constitutes “environmental information” and the parties that are required to disseminate it. In this regard, it is noteworthy that Crown and public service corporations are subject to the same environmental disclosure requirements as public bodies.

3.2. Corporate Environmental Disclosure in England and Wales

Fiduciary positions have stringent obligations attached. They are imposed by the rules of Equity in England and Wales and have been poorly categorised hitherto (Martin, 2005). In company law however these duties *vis-à-vis* company directors have been codified by s.172 of the Companies Act 2006. Fiduciary duties of directors are owed to the company itself and not to individual shareholders. Therefore when such duties are breached harm is done against the company and as such only the company is the proper claimant, save in exceptional circumstances. *Foss v. Harbottle* (1843) is the case which established the precedent in this area, according to which, when harm is done against the company, only the company is the proper claimant for suing the directors.

In England and Wales, contrary to many civil law countries, companies may be prosecuted as well as the directors of a company (French et al., 2008). Furthermore according to several statutes any director, manager or secretary can be prosecuted personally if the offense is committed with their consent or their connivance, or is attributable to their neglect¹⁰.

Section 172 of Companies Act 2006 is said to have taken a step towards legal recognition of corporate governance and corporate environmental and social responsibility (Copp, 2009). This section imposes a duty on directors of a publicly listed company in England and Wales to act in the way they consider, in good faith, would be most likely to promote the success of

⁹ The full name of the Convention is UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

¹⁰ Environmental Protection Act 1990 s.157(1), Water Resources Act 1991 s.217(1), Town and Country Planning Act 1990 s.331(1).

the company for the benefit of its members as a whole. In doing so, directors must have regard (amongst other matters) to the impact of the company's operations on the community and the environment, and the desirability of the company maintaining a reputation for high standards of business conduct (s.172(1)(d) and (e)).

These considerations, namely social, environmental and ethical considerations are of immense importance to pension funds, which are the most institutional shareholders in publicly listed companies (French et al., 2008, p. 470). Institutional shareholders require information about the effect of the business operations of firms on the environment (such as climate change, and the efforts the firm takes to address these challenges) in order to correctly analyse the risks posed to such firms, and therefore to the potential investment fund¹¹ (CRDI, 2006). Occupational Pension Funds are themselves subjected to such requirements through s.35 of Pensions Act 1995, namely the requirement to produce a statement of their investment principles, stating the extent to which social, environmental or ethical considerations have been taken into account in the selection, retention and realisation of investments.

The phrase 'for the benefit of the company as a whole' in s.172 is contentious and open for interpretation. It has been suggested however that in the case of business-led companies the term is likely to be interpreted as pertaining to the long term financial benefits of the company (French et al., 2008, p. 468).

The disclosure of information regarding the effects of the company's activities on the environment is an area of corporate governance, which the Companies Act 2006 has not dealt with explicitly and has thus been left to the interpretation of the courts. Companies generally are reluctant in publishing details about their business strategies, constantly fearing too much disclosure of information will lead to the revelation of their sensitive trading secrets. However, concurrently publicly listed companies are required to annually publish their accounts for the benefit of their shareholders and potential investors¹². Companies seldom publish accounting information and details of their corporate governance procedures without regulations imposing duties to such effect. Under English company law, the extent to which

¹¹ This is the basis of Rules 1.2, 1.4 and 1.5 in Chapter 7.

¹² Companies Act 2006, Part 15.

the disclosure of information to shareholders is required is uncertain in some cases. One such area is the impact of the company's operations on the environment. In such cases, the relevance and the materiality of the information to the future of the company are particularly contentious.

The Privy Council in *Brickenden v. London loan and savings Co* (1934) per Lord Thankerton upheld the Canadian Court of Appeal's judgment, stating that when it is established that the information withheld by the fiduciary were material, it becomes irrelevant if the court establishes that the constituent (principal) would have taken a different approach in light of the information. This dictum however has since been reinterpreted so that the fiduciary bears the burden of proving that the claimant would have acted in the same way had there been full disclosure of proper information. Later judgments emphasise the necessity of a causal link between the breach of duty and the loss suffered (*O'Halloran v. RT Thomas and Family Pty Ltd* (1998b)). Precedent following this case seems to side with the necessity of causation with the onus of proof lying on the claimant.

In 2005 the White Paper on the Companies Act 2006 described disclosure reforms as "a further major step forward in improving company reporting and transparency and in promoting effective dialogue on the drivers of long-term performance" (Pedamon, 2010, Clark and Knight, 2008).

The Operating and Financial Review (OFR) had proposed non-financial reporting on environmental and employee matters prior to the enactment of Companies Act 2006. Under these proposals, companies were to be required to include information about the environment including analysing the impact of the company on the environment. Companies were also required to provide "information about social and community issues". The new Bill however dropped the forward looking elements, namely the future cost of the company on the environment (Clark and Knight, 2008). Therefore currently the Companies Act 2006 requires directors to provide an annual Directors' Report, which must "include information about [...] environmental matters (including the impact of the company's business on the environment)" in its business review section^{13, 14}. The brief requirement in this report is the only duty

¹³ Companies Act 2006, s.417(5)(b)(i).

¹⁴ See Corporate Environmental Disclosure under EU Law below for further discussion.

imposed on directors by regulation for environmental disclosure in the UK. According to the report, the purpose of the business review is “to inform members of the company and help them assess how the directors have performed their duty under section 172 (duty to promote the success of the company)”¹⁵.

The Companies Act 2006 provides a list of requirements for the contents of the Directors’ Report while lacking detailed explanations about the extent of information disclosure necessary. This problem is exacerbated in the case of environmental disclosure, where any explanation has been reduced to a bare minimum. This has resulted in almost no disclosure of the effect of companies’ operations on the environment and the risks posed to the future of the company from climate change related problems.

For example, Tesco Plc.’s Annual Report 2009 writes in length about the investments Tesco is making in redesigning their stores to increase their energy efficiency, stating that the company’s overall carbon intensity has reduced by 21% since 2006 (Tesco, 2009). However the section dedicated to environmental matters is less than a page of the 140 page-long annual report and lacks material information relating to risks posed to future investments. Another example is British Airways Plc., whose 2009/2010 Annual Report briefly explains numerous methods in which the company is investing in reducing the companies carbon footprint and developing sustainable biofuels (British Airways, 2010). The section on environmental efforts of the company comprises two pages out of the 132-page report. However, notwithstanding the comparatively large section on the environment, the report lacks an explanation as to why exactly shareholders should have a desire to compromise short-term profits in return for improving the company’s carbon emission rates and energy efficiency.

Firms respond differently when faced with the public demand for disclosure of environmental information. The extent of disclosure of such information therefore varies between firms, in the absence of clear guidelines about the type and the amount of information sufficient for proper corporate environmental disclosure. In the current example, neither of the two companies disclosed the risks that environmental matters pose to the sustainability of their businesses.

¹⁵ Companies Act 2006, s.417(2).

It should be noted however that under s.82(1) Companies Act 2006, a right has been reserved for the Secretary of State to demand by regulation, the disclosure of specific information in specific locations and the inclusion of specific descriptions of documents or communication. Such regulations however will be targeted at specific firms and are not designed to provide a universal disclosure of environmental impact information.

The Financial Services Authority (FSA) had also proposed the inclusion of the requirement of environmental reporting into the FSA mandate as part of the Financial Services and Markets Act 2000. While the UK government disagreed with the proposed inclusion, Sweden took the initiative and adopted the strictest reporting standard requirements (Clark and Knight, 2008). Under the Swedish regulatory reform, since January 2001 the five largest state-run pensions are required to incorporate environmental and ethical considerations in their investment strategies as well as report to the Government on the implementation of this policy (BELSIF, 2010). The first legislation imposing a duty upon Swedish companies to report the impact of their business activities on the environment was the Swedish Environmental Code 1999, *Miljöbalken* (Nyquist, 2003). Furthermore subject to the provisions of the Annual Accounts Act, the Swedish Accounting Standards Board issued a statement in 1998 declaring that firms must disclose environmental matters related to the firm's present and future position and financial results (*Ibid*). Nevertheless, although there is widespread evidence that governments prefer to impose different regulatory standards depending on industry requirements, to the Authors' knowledge the top five state-run pension funds are the only set of firms in Sweden from whom a specific standard for environmental disclosure is required.

Industrial leaders in the UK are often consulted when a bill is proposed which will affect businesses and thereby the economy. In August 2010 the Department for Business, Innovation and Skills consulted 89 companies and associations on plans to force companies to disclose information about corporate social responsibility and the risks posed to their businesses thereof. The GC100¹⁶, supported by the City of London Law Society rejected these plans fearing that such moves will leave companies vulnerable to legal action (Law Society Gazette, 2010). It seems that the reason for this refusal is the increased frequency of change in the rules governing this area of law. The GC100 response to the above consultation

¹⁶ The association for general counsel and company secretaries in FTSE 100 companies.

paper states that companies are concerned that stating too many of the risks posed to their businesses “could give a misleading impression of a company’s position”, and in particular would be detrimental to companies with US listings (GC100, 2010). Surely, the nature and style of presentation as well as the flexibility that firms would have in relation to the characterisation of these risks should alleviate such concerns. Further to this point, the company members of GC100 accept the risk of liability should their Annual Reports lack material information with regards the future risks to the business and profitability (GC100, 2010). The general response from the respondents to the consultation paper is in line with that of GC100, where the general view is that directors “aspired to provide useful and relevant information on these issues which was supplemented by other forms of investor communications” (Department of Business Innovations and Skills, 2010).

It is clear that corporate environmental disclosure has been deliberately omitted from the Companies Act 2006. Therefore it is essential to turn to case law for the possibility of deriving a fiduciary liability for lack of such disclosure. This issue is addressed in detail in section 3.6. below.

Due to the absence of rules governing environmental disclosure in England and Wales, market intermediaries have sought to supply reporting standards and data to stakeholders. Accordingly, there are firms who begin with a comprehensive array of variables designed to capture the crucial issues relevant to corporate environmental and social responsibility factors. Beginning with companies’ Annual Reports and websites, these firms then interview companies to augment their initial assessments. From there they develop qualitative scores to indicate corporate performance benchmarked against industry and country averages. The resulting scores, derived ultimately from directors’ disclosure and the evaluation of collected data across a number of indicators, become relevant to institutional investors. Therefore effectively these types of intermediaries seek to capture current performance against relevant standards and supply their assessments of companies’ likely future performance to the market (Clark and Knight, 2008).

An important provider of corporate environmental disclosure standards related data that flows through global financial markets is the London-based International Accounting Standards Board (IASB). The International Financial Reporting Standard (IFRS) is a set of rules aimed at harmonising accounting standards and requirements for listed companies globally, and is

implemented by IASB (IFRS, 2010). It is noteworthy that since 2001 almost 120 countries have at one point required the incorporation of IFRS into their domestic accounting standards (IFRS Foundation, 2010). The UK, Germany and France have incorporated these standards since 2005 as part of the EU adaptation in implementation process. In the United States however, is yet to make a final decision about acceding to these standards. However even these widely accepted international standards do not require corporate environmental disclosure for listed companies.

In the international arena, the Organisation for Economic Co-operation and Development (OECD) has introduced Guidelines for Multinational Enterprises. The OECD provides a forum for governments to tackle common problems ranging from climate change to labour relations, and its mission is “to promote policies that will improve the economic and social well-being of people around the world” (OECD, 2011). The organisation sets voluntary guidelines¹⁷ for social responsibility in multinational businesses, operating from one of the 34 Member States of the OECD. These Guidelines are the most comprehensive set of instruments agreed upon by governments, and aim to encourage multinational corporations to make positive contributions to economic, social and environmental progress (OECD, 2000). On general sustainable development objectives, the guidelines state that enterprises *inter alia*, should:

- Take due account of the need to protect the environment and generally to conduct their activities in a manner contributing to the wider goal of sustainable development;
- Establish and maintain a system of environmental management, including collection and evaluation of adequate and timely information regarding the environment, establishment of measurable objectives and regularly monitoring and verifying progress toward environmental objectives;
- Assess and address the foreseeable environmental impacts associated with the process of implementing new decisions, and to prepare and appropriate environmental impact assessment.

The OECD Guidelines take into account the reluctance of companies in disclosing information due to associated costs, business confidentiality and the protection of intellectual

¹⁷ The latest version of these Guidelines was published in 2000.

property rights. Accordingly, regarding disclosure of environmental information the guidelines state enterprises should:

- “Provide the public and employees with adequate and timely information on the potential [environmental] impacts of the activities of the enterprise, which could include reporting on progress in improving environmental performance;
- Engage in adequate and timely communication and consultation with the communities directly affected by the environmental ... policies of the enterprise and by their implementation.”

However, because of the voluntary nature of accession to the OECD Guidelines, the enforcement mechanism of the principles is left to mere recommendations. Adhering governments are obliged to create National Contact Points, tasked with conducting promotional activities, handling enquiries and connecting enterprises to each other and to governments (OECD, 2000).

It is clear, therefore, that the OECD Guidelines do not create positive obligations for company directors to disclose information *vis-à-vis* the impact of the activities of their companies on the environment. Nevertheless, despite the OECD’s lack of jurisdiction, its guidelines clearly contribute to the growing momentum around demand for such disclosures. Due to the flexible nature of the common law (and its consideration of legislative developments), it is likely that the courts will attribute a greater weight to financial loss caused by lack of environmental reporting, and thereby stretch the ambit of the directors’ fiduciary duties so as to create such obligations.

3.3. Corporate Environmental Disclosure under EU Law

There is extensive commentary on how Companies Act 2006 is in line with the European Union Modernisation Directive¹⁸. The UK was the first Member State in Europe to incorporate this Directive into its law and to propose higher standards of director duties. Following the abolition of the expansive OFR requirements for UK listed companies, the requirements of the EU Modernisation Directive were incorporated in Companies Act 2006

¹⁸ Directive 2003/51/EC at [2003] OJ/L178/16.

under the less stringent regime of the Business Review¹⁹ (Trucost, 2005, Radley Yeldar, 2006). The Directive sought to bring EU-wide accounting standards in line with those of the International Accounting Standards (Trucost, 2005). The Modernisation Directive had even wider implications, amending both annual reporting (under the Directive on annual accounts of companies with limited liability²⁰) and consolidated annual reporting (under the Directive on consolidated accounts of companies with limited liability²¹).

It instituted a system of reporting whereby companies must provide “at least a fair review of the development and performance of the company’s business ... together with the principal risks and uncertainties that it faces”. Although this did not explicitly refer to environmental, social or governance factors of firms, the Directive provided that “where appropriate, non-financial Key Performance Indicators (KPI) relevant to the particular business, including information relating to environmental and employee matters” shall be reported (Clark and Knight, 2008).

It is noteworthy that the Companies Act 2006 uses the same terminology when incorporating the new standards for the contents of the Directors’ Report in s.417. Section 417(6) of the Act states that the Business Review must include financial KPIs, and “where appropriate, analysis using other key performance indicators, including information relating to environmental matters”. The Act defines KPIs as “factors by reference to which the development, performance or position of the company’s business can be measured effectively”, stipulating that they differ from one industry to another. In light of the abolition of OFR requirements, the UK Accounting Standards Board published reporting guidelines, specifying what the board believes the Companies Act 2006 requires. The guidelines state that KIPs that are “judged by the directors to be effective in measuring the development, performance and position of the business of the entity should be disclosed, together with information that should enable members²² to understand and evaluate each KPI”. The Reporting Statement

¹⁹ The Business Review is the main part of the Directors’ Report as imposed on companies by the Companies Act 2006 (s.417).

²⁰ Directive 78/660/EC.

²¹ Directive 83/349/EEC.

²² Section 112 Companies Act 2006 defines members as shareholders and every other person who subscribes to a company’s memorandum.

also contains a number of illustrative examples annexed to the report (Accounting Standards Board, 2006).

The European Commission sought consultation from various stakeholders on the existing policy on the disclosure of non-financial information and data on 28 January 2011 (European Commission, 2010, European Commission, 2013c). After four meetings of the members of the Expert Group, a decision is yet to be finalised on the policy of the European Union going forward. In the final meeting on 30 September 2011, most of the Experts agreed that whilst a framework pertaining to non-financial disclosure should be clearly defined in legislation, the framework should include the following:

- The company' assessment of risks and opportunities relevant to its particular business;
- Its policy on identifying, assessing and managing key risk and opportunities, and how this policy is integrated with the overall business strategy;
- How this policy is implemented in its operational activities (including systems and processes);
- Its results and forward-looking expectations; its measurement methodology;
- Whether the report is based on internationally recognised standards, guidelines or principles and if so, which ones. Some experts added that a report should also include statements concerning the inclusion of stakeholders, due diligence, as well as monetary and non-monetary incentives (European Commission, 2011).

However, no final decision has been made in this regard and no further meetings have been scheduled thus far (*Ibid*).

3.4. Corporate Environmental Disclosure in the United States

The Securities and Exchange Commission (SEC) in the United States, in line with Securities and Exchange Act 1933 requires companies to submit a Form 10-K annually, which creates the basis of a company's Annual Report to shareholders. The Form 10-K lacks a self-contained section dedicated to environmental disclosure. Nonetheless under this legislation companies have to disclose their stance on climate change initiatives and the way in which their business fits within the climate change debate (Peters and Romi, 2010). Such information is of particular importance to institutional investors because of the large capital

involved. The information that companies are legally bound to report are the following (Securities and Exchange Commission, 1979):

- a) The effects of the company's business on climate change during the previous reporting year;
- b) The position of the company *vis-à-vis* climate change initiatives;
- c) What the company is doing to reduce its emissions;
- d) Are there likely to be legislation and regulations on climate change which would affect the profitability of the company?
- e) If so what are the likely consequences of such restrictions on the company.

The rules of the SEC also require foreign entities to make certain environmental disclosures. Therefore, the more stringent SEC rules apply in cases where a company is based outside the US, but nevertheless operates in the US through a limited company registered there. However, in cases where a company operates in the US but is registered in foreign territories, then the less stringent rules apply. Under such rules, the foreign entity is required to:

- Disclose its material risks;
- Disclose material effects of government regulation on its business alongside identifying the relevant governing body;
- identify environmental issue which may affect the utilisation of its assets;
- explain the factors that have affected the company's financial conditions and results of operations during the accounting periods, and the management's assessment of factors and trend anticipated to have a material effect on the company's financial condition and results of operations in future; and -
- provide information on any legal or arbitration proceedings which may have (or have had in the recent past) a significant effect on the company's financial position and profitability.

Currently under the Securities Act Rule 408²³ and the Exchange Act Rule 12b-20²⁴, a company registrant is required to disclose "such further material information, if any, as may

²³ 17 CFR 230.408.

²⁴ 17 CFR 240.12b-20.

be necessary to make the necessary statements, in light of the circumstances under which they are made, not misleading.” Item 101 of the Regulation S-K expressly requires disclosure regarding the cost of compliance with the legislations in certain cases:

“Appropriate disclosure also shall be made as to the material effects that compliance with Federal, State and local provisions which have been enacted or adopted regulating the discharge of materials into the environment, or otherwise relating to the protection of the environment, may have upon the capital expenditures, earnings and competitive position of the registrant and its subsidiaries. The registrant shall disclose any material estimated capital expenditures for environmental control facilities for the remainder of its current fiscal year and its succeeding fiscal year and for such further periods as the registrant may deem material”²⁵.

It is to be noted that according to the SEC, the term *legislation* includes international treaties and accords, such as the Kyoto Protocol, the European Union’s Emission Trading System and “other international activities in connection with climate change remediation” (Securities and Exchange Commission, 2010).

Moreover the Clean Air Act Amendments of 1990 (s.1630) require companies to benefit from the latest technology to reduce pollution. The US Environmental Protection Agency (EPA) has reportedly calculated the cost of compliance with this Act for each major industry. Therefore the EPA is of the opinion that large companies already are aware of the compliance costs. Since January 2010 the EPA required all large GHG emitters to collect and report data *vis-à-vis* their emissions; it is expected that this move will help identify the sources of 85% of US emissions (Securities and Exchange Commission, 2010). Also the Comprehensive Environmental Response, Compensation and Liability Act (1980) allows for the designation of waste transporters and waste generators, as well as past and present owners and operators of hazardous waste sites as potential responsible parties (PRP). Also, unlike most fault-based liability schemes, past or present owners of a hazardous waste site can be held liable without regard to whether they were responsible for the release of hazardous substances, and each PRP is jointly and severally liable for the cost of cleaning the entire site.

²⁵ 17 CFR 229.101(c)(1)(xii).

Subsequent to petitions from environmental and investor groups, in January 2010 the SEC stated that companies should warn investors about the potential threats posed to their business by global warming (Broder, 2010). In their subsequent interpretive release, the SEC indicated their interests in a more thorough and extensive disclosure regime, stating that disclosure obligations also apply to the likely impacts on companies resulting from physical changes due to climate change and indirect consequences of regulations or business trends (Securities and Exchange Commission, 2010).

Should the current trend towards increasing the latitude of legislation fail to impose liability for inadequate non-financial accounting, then it is increasingly likely that the disclosure of such information will fall within the ambit of fiduciary duties.

The Securities and Exchange Act is widely believed to have been designed in order to promote the full disclosure of material facts. Inspectors of the SEC pay close attention to the adequacy and the review of filings and will require correct disclosure of relevant information from the company in question should they find contradictory information. It is therefore clear that there is an increasing trend in the United States for corporate environmental disclosure.

However notwithstanding this trend, a movement in the US Congress seems to have evolved aiming at curbing the current Administration's efforts for corporate environmental accountability (Cowan, 2010). Nevertheless even if the Republican Congress is successful in blocking new bills it is likely that the courts will likely place the disclosure of material information relating to the environment in the list of fiduciary duties. The importance of the term 'material information'²⁶ was discussed above, as it applies in the jurisdiction of England and Wales. On the international stage, the Aarhus Convention provides an environmental agreement between governments, linking environmental rights to human rights, acknowledges a duty to future generations, seeks to involve stakeholders in sustainable development, lists governments' accountability and environmental protection, and focuses on the interaction between the public and public authorities (UNECE, 2011). The Convention defines Environmental Information as:

²⁶ See above for discussion on the relevance and materiality of information: Corporate Environmental Disclosure in England and Wales.

“... any information in written, visual, aural, electronic or any other material form on:

- a) The state of elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites, biological diversity and its components, including genetically modified organisms, and the interaction among these elements;
- b) Factors, such as substances, energy, noise and radiation, and activities or measures, including administrative measures, environmental agreements, policies, legislation, plans and programmes, affecting or likely to affect the elements of the environment within the scope of subparagraph (a) above, and cost-benefit and other economic analyses and assumptions used in environmental decision-making;
- c) The state of human health and safety, conditions of human life, cultural sites and built structures, inasmuch as they are or may be affected by the state of the elements of the environment or, through these elements, by the factors, activities or measures referred to in subparagraph (b) above.”

The above is a comprehensive, albeit rather complex, definition. Thus it is not untenable to assert that a harmonisation of definitions should take place, whereby any information falling outside the above definition would become ‘irrelevant and immaterial’. For harmonisation to be effective, Member States must incorporate the definition into local rules.

On the other hand, however, there is also merit to the argument that attempting to define concepts such as the *environment* is fundamentally flawed. Those arguing this school of thought believe that protecting the environment, which is the ultimate aim of environmental regulation, is an extremely important issue given that damage to it has in many cases been irreversible. The main concern here is that a legal definition of a concept as wide as the *environment* will most likely contain deficiencies in the years after its establishment. As such, defendants (i.e. potential polluters of the environment) will, naturally, seek to place the damage caused outside of said legal definition of the environment. Therefore, it is argued that maintaining a loosely defined legal understanding which is not exclusive as to what constitutes the environment will help in protecting it from potential polluters by way of, for example, regulations, law suits or injunctions.

Whilst the merits of the above argument are clear the assertion of the current thesis remains that legal certainty is of utmost importance for corporate sustainability. The underlying bases

of Chapter 5 (below), and to a limited extent the current Chapter, is that market uncertainty acts against the greater sustainability agenda of large and multinational organisations. It follows, therefore, that legal certainty will also benefit the market as a whole in achieving economic growth whilst adhering to sustainability criteria.

3.5. The Aarhus Convention

At this juncture, some further consideration of the Aarhus Convention is warranted given the EU and her Member States' signature status and ratification efforts in respect of the Convention. The United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters is commonly referred to as The Aarhus Convention. It was adopted by said UN agency on 25 June 1998 and entered into force in 2001 (Europa, 2014). The significance of the Aarhus Convention in international law is that it enshrined the rights of access to environmental information, for public participation in environmental decision-making, and to review procedures to challenge public decisions. The European Union and all her Member States signed and ratified the Convention the same year, and was incorporated into EU law by virtue of Decision 2005/370/EC. In the case of *Lesoochranárske zoskupenie* in 2011, the ECJ ruled that Art. 9(3) of the Aarhus Convention, together with the Convention itself, are part of EU law (2011b).

The Convention is also of importance given its prevailing specialist treatment of “environmental information” within the law of the European Union. As stated, the Convention already applies to crown corporations and public interest corporations. Under the law of England and Wales, the Convention does not treat private companies and public liability companies as having the same disclosure requirements as such corporations or government bodies (i.e., “public authorities”). In a recent decision of the Upper Tribunal (Administrative Appeals Chamber)²⁷, water companies were determined not to be subject to the Environmental Information Regulations (SI 2004/3391)(EIR 2004). This decision has been appealed to the Aarhus (Convention) Compliance Committee in Geneva. It is noteworthy that only states are direct subjects of public international law (i.e. not firms or individuals). Thus, the only means by which a firm would be subjected to international law is

²⁷ Upper Tribunal Case No. GI/2458/2010.

if the host state ratifies and subsequently incorporates the provisions of international law into local legislation.

What is interesting about the case is its illustration of the often complex challenge of interpreting the following aspect of the Convention taken from the definition of “public authority” to which the Convention’s environmental disclosure requirements apply. Article 2(2)(c) refers to “any natural or legal person having public responsibilities or functions”. Naturally, water companies take responsibility for the provision of drinking water and water more generally to civil society. As such, they are capable of being construed as falling under Article 2(2)(c) were it not for the requirement (which Water Companies are adjudged not to have met) of being under Government control even though they are regulated by the Secretary of State and OFWAT. Interestingly, DEFRA’s Guidance on the EIR, 2004 (Chapter 2 – Who is Covered by the Regulations?), suggests that private companies may also be covered by EIR 2004 as it provides a wider definition than that covered by the Freedom of Information Acts 2000. Hence, the Guidance concludes that private companies may also be covered under EIR 2004. As the nature of control of a body may change over time, it is impossible to produce a definitive list of bodies covered by EIR.

In the interests of transparency and good corporate governance, there is some utility in considering the application of the Convention's principles, language and exceptions from disclosure in the publicly available literature pertaining to such companies. The remainder of this subsection analyses the scope of environmental information and exceptions. The scope of environmental information that is subject to disclosure the Convention Article 2(3) has already been identified.

Access to information on environmental matters is further regulated by Articles 4 and 5 dealing with the collection and dissemination of environmental information. These two articles deal with the essential aspects of providing information: the active and passive dissemination of information. “Passive” provision of information is the provision of information upon request. Once a request is made, the public authority provides the information. “Active” provision of information occurs when public authorities are obligated to disseminate necessary information proactively (i.e., without being asked by another stakeholder). In respect of both passive and active environmental information provided by firms to a Government body, complete transparency is required such that any request for the

said environmental information which is not already available must be honoured by the relevant Government body holding the information. For example, any dialogue or communication in respect of environmental permitting and documents related to environmental permitting of a firm are meant to be readily available to anyone that requests said information. As such, it is in a firm's interest to pursue a corporate policy of transparency in these areas as it is already a legal requirement.

This position is taken out of the further recognition that as European Union states are becoming more transparent in environmental decision-making [including the pursuit of transparency in respect of all stakeholder (i.e., corporate) consultations in this regard] there is a trend towards seeing all environmental information as being in the public interest. This leads citizens to be more proactively involved in advancing environmental protection and asks public authorities to exercise greater responsibilities in respect of environmental decisions while seeking greater transparency from those firms that are regulated in this field.

With this approach in mind, the content of the access to environmental information provisions of the Aarhus Convention should be examined.

Article 4 of the Aarhus Convention includes:

- Responsibilities for public authorities to establish a framework through which they can guarantee that members of the public will gain access to environmental information on request (Art 4.1);
- Public rights to receive information when requested (Art 4.1);
- Conditions and procedures for receiving information, including:
 - Time limitations in relation to this process (Art 4.2);
 - Factors influencing when and in what form the information must be disclosed (Art 4.1), and;
 - Circumstances in which a request for information may be refused (Art 4.4).

Article 5 covers other aspects of the provision of information, namely:

- Responsibilities of public authorities to possess and provide information actively, without request (Articles 5.1 and 5.2);

- Means to provide public access to all this information through different channels, including information centres, public registers, databases, web-sites, etc. (Art 5.1 - 5.9); and,
- Circumstances surrounding the refusal to disclose certain environmental information (Art 5.10).

Overall, the Aarhus Convention obliges public authorities to:

- Ensure free access to environmental information (including information held by firms in respect of environmental protection regulation);
- Obtain and manage environmental information;
- Disseminate certain types of environmental information on an active basis.

As such, the grounds for refusing access to environmental information (for example, Articles 4.4 and 5.10) should be interpreted restrictively.

It is submitted that in respect of those grounds the exceptions are sufficiently generous to protect corporate social responsibility-minded firms from commercial or reputational damage.

One such exception is the confidentiality of commercial or industrial information. A variety of commercially or industrially sensitive information can arise in relation to this exception: trade secrets, information supplied by contractors, information supplied for a tendering process and information held by regulators serve as examples. In order to qualify for the exception such categories of information need to be explicitly provided for in national law. It should also be noted that the protection of “legitimate economic interests” include those interests or matters that are clearly compliant with applicable law. As such, firms need not worry where there is “nothing to hide” so to speak. Information surrounding non-compliance matters (i.e., exceeding legally required emission limits) is not subject to this exception and should normally be reported to shareholders as a matter of fiduciary duty. As a supporting point, the release of information on damage to the environment would clearly be a matter of public interest. As such, it could not be shielded from disclosure in any event.

In respect of intellectual property rights, the confidentiality of commercial or industrial information is different from the intellectual property rights exception as the latter exception may also apply provide protection to information that is commercially valuable whether or not it is held by public authorities. As a general rule, the intellectual property rights exception can protect industrial property such as inventions, brands, designs, trademarks or geographical indications as to source of origin. The exception will recognise the protection of copyrights and patents. It does not apply where these conventional types of legal protection are absent. This exception is to be interpreted to avoid the circumstance where such disclosure would reasonably be seen to undo the benefits of such legal forms of protection to the commercial intellectual property right holder.

If the information would be protected, even after disclosure, by way of the Copyright, Designs and Patents Act (1988 as amended) for instance, then the reason not to disclose would be undermined as the penalties for infringement would be in place to protect the right holder.

It is worth noting that corporate reports, studies or data collected by public authorities do not qualify for protection under this exception and as such are already required to be disclosed by firms to anyone that asks for the said information. As well, in relation to the environmental regulation of firms, information pertaining to the environment to which corporate activity relates is also subject to disclosure without exception. As such, firms should consider a policy of transparency as this is already a legal requirement not excepted by the Convention Article 4 exceptions (see Article 4(h) in this regard).

3.6. Fiduciary Duties and Corporate Environmental Disclosure in Practice

It is clear from the regulations and laws outlined above that there is a compelling trend towards accurate and adequate environmental disclosure by corporations. This trend seems to be led by the United States and followed by the UK and other countries in the wake of the enlightened shareholder value principle. This principle provides a middle-ground between the two extreme approaches of the 'shareholder primacy' and the 'pluralist' view of directors; it suggests that promoting the success of the company is only possible when taking into account the wider concerns shared by stakeholders of any given company (Yap, 2010, French et al.,

2008, p. 32). Shareholders increasingly have been calling for a more thorough non-financial environmental disclosure by public companies (Securities and Exchange Commission, 2010).

In April 2010 an explosion occurred on an offshore oil rig called Deepwater Horizon which was leased by British Petroleum Plc. (BP). The explosion led to the total spillage of 18-30 million gallons of oil onto the area surrounding the Gulf of Mexico, catastrophic damage to the natural habitat in the vicinity of the rig, and the loss of life of 11 workers. BP has been deemed responsible for much of the environmental damage and blamed for negligence in containing the resulting oil spillage.

Lawsuits have been contemplated by shareholders and other stakeholders of BP against the directors of the company on the basis that the directors breached their fiduciary duties to shareholders by exposing the company to civil and criminal liability. The first of these cases was *Firpo v Hayward et al.* (2010b), filed in the Louisiana Eastern District Court on 7 May 2010. In what is essentially a derivative claim, the claimant argued that the directors breached their fiduciary duties towards the shareholder by repeatedly neglecting safety warning with regards the Deepwater Horizon rig. They further claimed that the directors caused BP to violate safety and environmental laws, exposing the company to criminal and tortious liability, subjecting the company to adverse publicity and impaired earnings.

It has been thought, however, that cases based on fiduciary duties may prove difficult in light of the decision of the Supreme Court of the United States in *Morrison et al v. National Australia Bank* (2010c), which restricts shareholders' ability to pursue foreign companies in the United States courts. Nevertheless, firstly this decision is in conflict with standard rules of conflict of laws in International Law and thus it is likely to be overruled; and secondly the prospects of filing a claim against BP in a US court are real due to the severity of the consequences of a wide-scale spillage which adversely affected many American citizens and business interests. Moreover the principle of Nationality in Public International Law allows proceedings to be heard in the country of citizenship of the claimant. Moreover, on 6 January 2011 the Whitehouse published its independent report on the causes leading to the spillage, in which it was stated that "this disaster likely would not have happened had the companies involved been guided by an unrelenting commitment to safety first" (Shankleman, 2011). The

National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (OSC)²⁸ further concluded that “overarching failures in management” had led to such dire consequences (OCS, 2011). It is thought that the OSC’s final report adds strong evidentiary value to pending lawsuits in this regard.

To that end, as of 20 September 2013, BP has faced some US\$600 million in costs for employing about 2,200 full-time equivalent staff in order to administer some 221,000 claims (whiles about 12,000 more are added every week) (Crooks, 2013a). Furthermore, the compensation payments have reached US\$3.6bn, and are on course to far exceed BP’s original estimate of US\$7.8bn for the total cost of the settlement (*Ibid*). The original projection of the cost of settlements less claims for loss of business was US\$9.6 billion, which is not projected to exceed US\$15 billion (*Ibid*).

In other such cases, in *Brown v. Medtronic* (2010a), Brown claimed that his company’s Board of Directors breached their fiduciary duties to shareholders when they deliberately disclosed deceptive information with regards the price of Medtronic’s shares, which were subject of a takeover by company in question. The US Court of Appeals (Eighth Circuit) held on 13 December 2010 that Brown lacked constitutional standing as a proper claimant and that he could not prove the causal link between the breach and any loss that he may have suffered as a result of the breach. Therefore the case was decided in favour of the defendants. However the Court did not rule out the possibility of the breach of fiduciary duties in such a way but stated that due to the lack of convincing evidence Brown’s claim, namely that Medtronic’s stock had become an imprudent investment is reduced to a mere allegation. This ruling could stand as a judicial precedence for breach of fiduciary duties in cases of non-disclosure of environmental impact on the business of a company.

In another example, Lloyds TSB Plc. in 2008 opted to purchase all the shares of Halifax Bank of Scotland to save it from imminent bankruptcy. The transaction went ahead with the approval of the majority of the shareholders in the company’s general meeting. However, in October 2010 shareholders claimed that they had been misled into the deal since the directors of Lloyds TSB withheld vital information about the true amount of HBOS’ liabilities. Their

²⁸ The Commission was established on 22 May 2010 in order to investigate the causes of the oil spillage in the Gulf of Mexico.

claim is that the directors have breached their fiduciary duties of disclosing the relevant information for the shareholders to reach an informed decision about the transaction²⁹. According to *O'Halloran v. RT Thomas and Family Pty Ltd* (1998b), the shareholders have to demonstrate a causal link between withholding information and the loss suffered by the company.

In another example relating to disclosure of general information (as opposed to environmental information), a large multinational enterprise was recently forced to withdraw from a contract for developing a transportation network in Israel due to political pressure from pro-Palestinian groups (Guardian, 2010b). The company had been accused of aiding Israel in its occupation of the Palestinian territories. Had the company dismissed the pressures and continued with the planned development in a purely business-led manner, then in the event of the destruction of their assets subsequent to war or bombardment of the West Bank, their shareholders would have had a potential claim against the directors for breaching fiduciary duties and placing the operations of the company in a hostile location.

In December 2010 the Air Resources Board in California voted to enact the much debated Cap-and-Trade system, the like of which had been proven successful in the European Union through the Emissions Trading System. Accordingly businesses trading in California will be required to purchase credits according to their predicted carbon emissions. Such large transactions will undoubtedly be reflected in the Cash Flow Statements and Balance Sheets of the companies taking part in the scheme, which would indirectly result in a public disclosure of the amount of their greenhouse gas emissions. This system will provide an incentive for companies to reduce their emissions, since it will reduce their costs of purchasing emission credits (Sweet, 2010).

Another important area of legislative activity is that of imposing criminal liability on actual and potential environmental damage through Directive 2008/99/EC. This Directive represented a breakthrough development in European Environmental law since environmental crime is particularly difficult to tackle; traditionally in common law legal systems a crime requires the two main elements of *actus reus* and *mens rea*, both of which are difficult to ascertain in the case of environmental damage, especially in cases where the

²⁹ This information is drawn from a personal letter sent the author.

issues in question is transboundary. For example, most of the large amounts of oil which is discharged into the sea annually is undetected (Watson, 2006). Nevertheless, the fact that environmental damage was often transboundary was one of the main arguments for adopting criminal law measures for this purpose on a Community scale (Mullier, 2010). Another argument for the imposition of criminal liability was that, according to the Commission, “the sanctions in force by Member States [were] not sufficient to effectively implement the Community’s policy on environmental protection” and that “only criminal penalties will have a sufficiently dissuasive effect” when it comes to environmental protection (Commission, 2003). The adoption of this Directive has, of course, started to harmonise environmental protection standards among Member States. This eliminates the possibility that an organisation or entity would feel that causing damage to the environment in the jurisdiction of one Member State will have a lesser penalty than in another’s – a so called “pollution haven”.

Article 3 of said Directive lists a number of activities which constitute a criminal offence. They have to be unlawful and be caused intentionally or at least through serious negligence, thereby attempting to circumvent the requirement of *mens rea* (although there is no strict liability offence). Article 3(a) states that causing “the discharge, emission or introduction of a quantity of materials or ionising radiation into air, soil or water, which causes or is likely to cause death or serious injury to any person or substantial damage to the quality of air, the quality of soil or the quality of water, or to animals or plants” constitutes a criminal offence. This is noteworthy in a number of respects: firstly, it included human health as a criterion within environmental damage; secondly, animals and plants have been given the same level of protection; and, lastly, that any act that is merely likely to cause any of the above is also considered an environmental crime. This places a heavy burden on manufacturing firms and those operating in heavy industries in terms of their risk management practices. The addition of this phrase, namely “likely to cause”, could lead to market uncertainty and a loss of efficiency among firms at the expense to an overly cautious regulator, which will undoubtedly find it extremely difficult to prove that a specific act is highly dangerous and is thus likely to cause environmental crime. However, it could be argued that the regulator has merely acted in accordance with the Precautionary Principle in this case, which is indeed a main component of the rule-based system below (Rule 2.8).

Article 4 goes further in implementing the traditional requirements of criminal law by criminalising inciting, aiding and abetting the intentional conduct referred to in Article 3. Articles 6 and 7 concern the liability of legal persons, but do not require criminal liability to be imposed by Member States on said entities. To that end, Article 7 requires that offending legal persons should be punished through “effective, proportionate and dissuasive penalties”, which differs greatly from the language of Article 5, in that there the penalties must be of criminal nature: “Member States shall take the necessary measures to ensure that the offences referred to in Articles 3 and 4 are punishable by effective, proportionate and dissuasive criminal penalties.” This apparent difference in language used pertaining to legal persons may be due to the lack of support in the EU legal system at the time among the Member States (Mullier, 2010).

In terms of implementation, the Directive has yet to be able to fully harmonise the criminal sanctions in all the Member States (*Ibid*). This is of crucial importance in order to tackle the sizeable turnover which is generated from so-called ‘green crimes’ (*Ibid*). The Directive lacks an Article on criminal cooperation, which is deemed necessary to ensure the proper functioning of the system put in place by said Directive (*Ibid*).

3.7. Environmental Impact

Thus far this Chapter has focused on the impact of companies’ activities on the environment. However no comprehensive definition of the environment and no unit of measurement for *impact* on the environment have been provided. Lack of clear legal definitions could potentially leave corporate environmental litigations susceptible to manipulation. In light of legal duties faced by directors as fiduciaries it becomes imperative to have a legal definition for what constitutes the environment, and to have a coherent framework for assessing the impact of a company’s operations on it³⁰. Leaving companies susceptible to potential legal claims is of particular concern to institutional shareholders. This influential group of stakeholders seek standardised disclosure of market-sensitive information such that data are comparable between companies (especially those in the same industries and countries),

³⁰ It is noteworthy that a process of environmental impact assessment exists within the European Union, which is regulated by Directive 2011/92/EU for individual projects (Environmental Impact Assessment – EIA Directive) or Directive 2001/42/EC (Strategic Environmental Assessment – SEA Directive for public plans or programmes).

consistent in definition and measurement over time, and comprehensive in nature and scope (Clark and Knight, 2008).

The relevance of the Companies Act 2006 to the environment has been stated above, namely in sections 172 and 417 of the Act. It should be noted that these are the only two sections in which the Act has sought to regulate companies' activities *vis-à-vis* the environment. The Companies Act 2006 is one the longest Act ever passed by the British Parliament (French et al., 2008). Nevertheless the term 'environment' appears no more than four times throughout the whole of the Act, and thus it is not surprising that it does not include a definition for it.

Elsewhere however, the UK Parliament has sought to define the environment, specifically in the Environmental Protection Act 1990, as consisting of "all, or any, of the following media, namely, the air, water and land; and the medium of air includes the air within buildings and the air within other natural or man-made structures above or below ground"³¹. Section 1(3) of the same Act defines pollution as "pollution of the environment due to the release (into any environmental medium) from any process of substances which are capable of causing harm to man or any other living organisms supported by the environment." Accordingly damage to non-natural reserves of water and private estates on land will constitute damage to the environment for the purposes of this Act.

Under the European Community Law, Article 2(1) of the Directive on public access to environmental information (The Aarhus Convention)³², passed in 2003 defines environmental information as any information on "the state of the elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites including wetlands, coastal and marine areas, biological diversity and its components, including genetically modified organisms, and the interaction among these elements". Therefore any information about the interaction of these elements also constitutes environmental information.

Furthermore the Environmental Impact Assessment (EIA) Directive³³ defines the environment as "human beings, flora and fauna; soil, water, air, climate and the landscape; natural assets and the cultural heritage and the interaction between the factors". This

³¹ Section 1(2).

³² EU Directive on access to environmental information 2003/4/EC, repelling council Directive 90/313/EC.

³³ Directive 85/337/EEC (as amended by Directive 90/313/EC).

definition seems to be comprehensive and dynamic, since it clearly attempts to include the effects of human activity on the environmental factors and vice-versa. The EIA Directive has been amended three times in 1997, 2003 and 2009.

Meanwhile on the International stage, the UN Framework Convention on Climate Change (UNFCCC), which established the basis of the Kyoto Protocol, also provides a broad definition of the adverse effects on Climate Change, namely the “changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare”. It is noteworthy that this definition also includes the effects of climate change on socio-economic societies as well as ecological systems.

It is of course encouraging to see attempts in writing comprehensive legally binding definitions for the environment in different sources of law. The environment refers to one's natural habitat and surrounding; however what exactly constitutes one's surrounding is contentious and thus open for debate. Therefore it is imperative for lawmakers to construct a non-exhaustive definition, while not allowing indefinite scope so as to include every possible source of legal damages in the definition. For example the UK's Environmental Protection Act 1990 appears to state that the “air within buildings” constitutes part of the environment. Thus industrial plants that pass polluted air through electro-filters before releasing the air into the atmosphere will still be seen as polluting the environment since they pollute the air within a building. Conversely the EIA Directive, while clearly trying to create a non-exhaustive definition, seems to have defined the term too widely. The EIA Directive adds ‘cultural heritage’ as a component of the environment. It is thought that the correlating link between cultural erosion and environmental destruction is not clear. This is while physical damage caused to monuments and cultural heritage is pursuable through other classic tort or criminal actions, such as criminal damage to public property.

Other problems in defining the environment arise from the scientific nature of the debate surrounding environmental matters. For example the definition provided by the Directive on public access to environmental information describes information relating to “biological diversities and its components including genetically modified organism” as environmental information. Surely there is debate surrounding the exact scope of biological diversities and

the definition of genetically modified organisms. It is therefore likely that contention will arise not from the definition of the environment, but from the definition of the elements comprising the environment according to this Directive. Moreover the UNFCCC emphasises the effects of climate change and the damages resulting thereof. For successful legal litigations, clear causal links between the damage and climate change has to be established. It is no myth, however, that the effects from climate change are not imminently visible. Establishing causation backed by scientific evidence is thought to be a time-consuming process, and one which may prove too burdensome to establish.

From the above discussion it becomes clear that defining the Environment in absolute terms is ill advised. While a definition for the environment should contain a non-exhaustive list of natural factors, unlike in the EIA Directive, it should not be too flexible so as to evolve towards every conceivable direction.

On the contrary however, it is thought that including humans as part of the environment, and thus equating the adverse effects on human health to environmental damage is a positive move. This is particularly so in the case of the definitions provided in the UNFCCC and the EIA Directive. It should be noted that these provisions overlap with the present civil and criminal charges such as nuisance (public and private) and negligence. As such, it is submitted that the definition provided by Article 2(1) of the Aarhus Convention provides the most suitable definition of environmental information, from which a definition for the Environment may be derived.

It is not clear which definition the Companies Act 2006 relies upon in ss.172 and 417. However in common law legal systems the courts will follow the decision of a higher court³⁴ in the relevant area of law, and in the event of a conflict between the established law and that laid out by the European Union, the latter will prevail.

3.7.1. Measuring the Impact of the Company on the Environment

Assessing the impact of the companies' operations on the environment requires units of measurement in order to allow comparisons. It is thought that institutional shareholders will

³⁴ Courts in the UK follow a hierarchal system. Courts follow the decision of higher courts in the hierarchy. The UK Supreme Court is the most authoritative court in the UK.

benefit most from a monetary value attached to such measurements. Currently the Emissions Trading Scheme among businesses in the European Union deals with a similar problem by attaching a price to units of emission of Carbon Dioxide (CO₂)³⁵. However dealing with the level of CO₂ emissions by businesses is only one aspect of environmental damage caused by businesses. Therefore it cannot be said that a company taking part in carbon trading is immune from legal challenges relating to environmental damage caused by its operations.

Nevertheless participating in emissions trading schemes invariably results in the attachment of a monetary value to the amount of CO₂ produced by the company. In the case of public companies, the cost a company incurs in order to offset their CO₂ emission will need to be reported to the shareholders. In terms of short-term financial gains of shareholders, this provides an instant monetary assessment of the impact of the company's operations to the environment. There have been suggestions that the CO₂ emissions should follow a minimum-pricing scheme, whereby even in the cases of excess supply of Carbon credits, the price of CO₂ will not fall beneath a certain threshold.

In order to reduce confusion among institutional shareholders and company directors, the term 'environmental impact' should have a clear definition when it is referred to in the context of corporate governance. One definition which appears to be widely accepted is that provided by Roche, namely that "impact assessment is the systematic analysis of the lasting or significant changes— positive or negative, intended or not—in people's lives brought about by a given action or series of actions" (2000). This definition adds the aspect of immediate outputs or the effects of a project or programme. Blowfield and Murray also accommodate the view provided by Roche, while further highlighting the importance of a causal link between inputs and the outcome of a project (2008). Wood defines environmental impact assessment as "the evaluation of the effects likely to arise from a major project (or other action) significantly affecting the natural and man-made environment" (Wood, 2003).

The Environmental Protection Agency of the United States defines environmental impact as "the effect of an activity or substance on the environment", while the Food and Agriculture Organisation of the United Nations defines it as "A change in effect on an environmental resource or value resulting from human activities including project development" (EPA,

³⁵ It is to be noted that the price for CO₂ is derived through a free market mechanism.

2011, FAO, 2011). On the other hand, the online dictionary of business studies defines the term as “Possible adverse effects caused by a development, industrial, or infrastructural project or by the release of a substance in the environment” (BusinessDictionary, 2011).

It is clear therefore that the definitions given for environmental impact follow the same approach. Therefore as Roche explains, ultimately it becomes a matter of judgement about what effects are ‘significant’ for whom and to whom, depending on the context in which the contentious has arisen (2000).

The UK Companies Act 2006 does not provide such a definition, but intended to deal with impact assessment through introducing a new system of reporting, namely the KPI system. By doing so the burdensome OFR regime was replaced with one whose meaning would be more loosely interpreted and applied. The Act, while specifying the use of key performance indicators, does not specify which indicators are “*key*” and thus ought to be used to provide shareholders and potential investors with a standard set of comparable indicators. Therefore as with many new laws, the courts will be tasked with making the correct interpretations on a case-by-case basis. Nevertheless it is thought that such uncertainties will have a positive impact on meticulous director, indirectly encouraging them to report more thoroughly than they would have done had the legislation been clear about the limits of corporate environmental disclosure.

Article 2 of the European Union’s Environmental Liability Directive 2004³⁶ outlines a comprehensive list of what constitutes environmental damage. It is thought that Article 2 could be construed as encompassing the meaning of adverse environmental impact. The Article deals with damage to endangered species, water and land in separate subsections, while defining ‘damage’ as “a measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly.”

³⁶ Directive 2004/35/CE, Article 2.

Furthermore, the Environmental Impact Assessment Directive of 1985³⁷ imposes a duty on the developer of an industrial project to report the extent of environmental impact derived from that project³⁸. EIA reports aim to highlight “the direct and indirect effects on:

- human beings, fauna and flora,
- soil, water, air, climate and the landscape,
- the inter-action between the factors mentioned in the first and second indents,
- material assets and the cultural heritage”

By virtue of Article 2, Member States are responsible for assessing the environmental impact of potential projects before granting the necessary permissions for that project. EIA reports are necessary for projects which are thought to have a significant environmental impact (CLG, 2000). The Member State hosting the particular project is responsible for ensuring that the developers supply the relevant information, which should contain "at least:

- a description of the project comprising information on the site, design and size of the project,
- a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects,
- the data required to identify and assess the main effects which the project is likely to have on the environment,
- a non-technical summary of the information mentioned in indents 1 to 3.”

The Directive was incorporated into the law in UK through the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999. Schedule 4 of these Regulations states the minimum requirements for the content of EIA reports; where inclusion of the elements of Part 2 of the schedule is mandatory and the provisions of Part 1 are only necessary where they are reasonably deemed to be helpful in properly assessing the environmental impact of a potential project. Thus the necessary elements in Part 2 are:

³⁷ This Directive has been amended three times in 1997, 2003 and 2009.

³⁸ Article 1(1) of the EIA Directive 1985 (85/337/EEC).

1. A description of the development comprising information on the site, design and size of the development.
2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.
3. The data required to identify and assess the main effects which the development is likely to have on the environment.
4. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.
5. A non-technical summary of the information provided under paragraphs 1 to 4.

It is immediately recognised that these provisions are far too broad and do not prescribe a detailed reporting structure. Part 1 of the Schedule however goes further in recommending that the report should contain a description of the main characteristics of the production process and an estimate of the expected residues and emissions resulted subsequent to production. It also recommends a description of the main alternatives studied before making a decision about utilising the particular process, the aspects of the environment which are most likely to be affected, and the extent of the measures taken to mitigate these effects.

The Department for Communities and Local Government in the UK has published guidelines to complement the EIA Directive and the above Regulations. These guidelines provide a checklist of elements to be included in the EIA report, but emphasise that it “is not meant to be regarded as a prescribed framework for all environmental statements” (CLG, 2000). Although this framework lacks any legal authority, it is thought that it reflects the UK government’s interpretation of the EIA Directive. However, the latest edition of the guidelines was published in 2000. Therefore the validity of the guidelines should be assessed using the more recent frameworks provided by non-governmental organisations; one such organisation which is dedicated to the harmonisation of global environmental reporting standards is the GRI³⁹.

³⁹ Some other non-governmental institutions that promote sustainability reporting include FTSE4Good, Ethibel Sustainability Index, KLD Indexes and Dow Jones Sustainability Indexes.

3.8. Disclosure through Market Intermediaries

Beyond legislative measures, such as the requirements of the SEC and the EPA's 2010 additions⁴⁰, a number of private reporting bodies have also started representing firms and conducting sustainability reports. Among them are the CorporateRegister⁴¹, the Climate Registry⁴², the Carbon Disclosure Project⁴³ and the Global Reporting Initiative⁴⁴ (Columbia Law School, 2010, CorporateRegister, 2010, Climate Registry, 2010, Carbon Disclosure Project, 2010, GRI, 2010). It is not untenable that companies would voluntarily submit environmental reports to these independent organisations. It is thought that the leading organisation which produces reporting standards to this effect is the GRI.

The use of Sustainability Balance Score Card (SBSC) as a framework for impact assessment has also been suggested (Schaltegger, 2010). The SBSC is said to lead to strategic sustainability management, which will lead to a system of KPIs. Nevertheless the SBSC seems to focus on the more general structure of the organisation instead of focusing on performance relating to a specific aspect of the company's operations, or the effects thereof. For example, the system examines five perspectives of finance, customers, internal business process, learning and development.

Some industries, such as the insurance industry, which is a critical global player in investment management, have taken a self-regulatory approach to environmental disclosure through national trade associations. For example in March 2009 the US National Association of Insurance Commissioners (NAIC) set a standard for mandatory disclosure by insurance companies to state regulators. Under these rules, every insurer with annual premiums of

⁴⁰ The environmental Protection Agency is seeking new legislation in order to curb GHG emission from fossil fuel plants. The bill will be introduced on 2 January 2011, but it is thought that the republican Congress may oppose it (Cowan, 2010).

⁴¹ The largest online database for sustainability reports, which monitors corporate reporting for the past 15 years.

⁴² A non-profit collaboration between North American states and territories setting standards for calculating, verifying and publicly reporting GHG emissions.

⁴³ Gathers GHG emission information and climate change strategies of some 3,000 companies in 60 different countries globally.

⁴⁴ A network-based organisation focused on developing and continuously improving a sustainability framework based on consensus building between stakeholders.

US\$500 million or more is obliged to submit annual surveys⁴⁵, beginning in May 2010 (NAIC, 2009). Under these rules insurers are required to disclose to the Government the financial risks posed to their businesses due to climate change and actions they have taken to mitigate those risks (Securities and Exchange Commission, 2010). More specifically, the White Paper⁴⁶ recommended that state insurance regulators develop standard climate risk disclosures which fulfil the following questions (NAIC, 2008):

- Are insurers adequately including climate risk, and climate risk changes, in their internal risk assessment process?
- Are insurers adequately informing and incentivizing policyholders as to their risks?
- Are the insurers' governance structures sufficient to keep its board members informed about climate risk?
- Are insurers taking adequate steps to mitigate their own risks and to foster policyholder mitigation?

This move is largely seen as a response to a study conducted by Ernst and Young in 2008 which called climate change the number one risk posed to the insurance industry (Ernst & Young, 2008)⁴⁷. According to this report the other risks are demographics change in key markets, catastrophic events, emerging markets, regulatory intervention, channel disruption, integrations of technology with operations and strategy, securities market, legal risks, and geopolitical or macroeconomic risks respectively. Analysts were shocked to see climate change-related topics, which were generally seen as long term problems, as posing the greatest risk to the Insurance industry (Mills, 2009).

In the UK and Europe, the insurance industry is vastly influential in the whole of society in a positive way through their involvement in domestic treasuries. From the letter of June 2013 from the Association of British Insurers (ABI) it is clear that the Insurance industry in the UK is also preoccupied with the issue of environmentally sound investments (ABI, 2013). The ABI actively engages with the fund managers on a variety of issues such as climate change, with the aim of promoting efficient markets and long term value. Furthermore, the ABI's

⁴⁵ Insurers have to complete an Insurer Climate Risk Disclosure Survey. For a number of sample surveys: http://www.naic.org/committees_ex_climate.htm [Accessed 11 January 2011].

⁴⁶ The Potential Impacts of Climate Change on Insurance Regulation.

⁴⁷ 'Legal challenges' has been placed as the ninth serious risk in a hierarchal table in the same study.

Guidelines on Responsible Investment Disclosure provides a list of disclosures, which institutional investors would expect to see included in the annual reports of listed companies (*Ibid*). As such, the Guidelines “encourage companies to identify and manage material environmental, social and governance risks to the long and short-term value of the business, including climate change, where appropriate. The Company’s disclosures should include information on how the Board considers these risks and the policies, procedures and verification systems in place to manage them” (ABI, 2007).

3.8.1. Global Reporting Initiative

The Global Reporting Initiative (GRI) has become the leading institution producing sustainability reporting standards; in 2005 69% of the companies surveyed by the International CSR survey of KPMG used the GRI frameworks, and 77% did so in 2008 (KPMG, 2008). In a research conducted by the Governance and Accountability Institute (sole data partner for GRI) in 2012, 53% of the S&P500 and 57% of the Fortune 500 companies are reporting on their Environmental, Social, and Governance, which represents a rise from 19% and 20% respectively from 2011. The vast majority of these reporting firms used the GRI framework for the sustainability reporting (G&A Institute, 2012).

As stated previously, the GRI has no legal authority and thus companies who adhere to these frameworks do so on a voluntary basis (the voluntary aspect of GRI is both in terms of implementing the GRI framework and in terms of the extent to which the framework is implemented). The reports produced and submitted by acceding firms will then be reviewed by GRI and ranked according to the extent to which said firm has reported based on the GRI criteria. These are called Application Level Grades (GRI, 2011a). In producing these reports, GRI recommends a five step procedure: prepare (consider what the firm’s sustainability report might contain in light of the firm’s major impacts), connect (identify key stakeholders and establish communication links), define (address internal and external areas of concern with management team based on stakeholder engagement), monitor (check processes and systems to ensure the quality of information and set performance goals) and finally, report (draft the report and communicate it) (GRI, 2013b).

In order to properly report the impact of a company’s operations on its environment, the GRI framework states that sustainability reports, *inter alia*, should observe the rules of materiality

and be mindful of the extent of the requirements of different groups of stakeholders. In order to assess the quality of sustainability reports, the guidelines propose the following tests:

1. The report should provide an unbiased picture of the organisation's performance.
2. The report should provide data which are comparable through the same period of the past two or three years.
3. Data should be accurate.
4. The data should be provided in a timely manner so as to provide ample time for stakeholders to take the appropriate action.
5. The report should be aimed to be as clear as possible for all stakeholders.
6. Stakeholders should have the necessary confidence in the reliability of the report.

Moreover, according to the GRI framework, sustainability reports should consist of three main sections, namely Strategy and Profile, Management Approach, and Performance Indicators. As part of the Strategy and Profile section, a managing director of the company should provide a statement explaining the key impacts of the company's operations on sustainability and the key risks and opportunities faced by the company for the benefit of the short-term and long-term stakeholders (GRI, 2006). As part of the Management Approach, managers are required to, *inter alia*, provide a layout of the organisational structure of the company and note the significant changes occurred during the past reporting period.

For current purposes, it is the Performance Indicators which warrant the most emphasis. These have been categorised into Economic, Environmental, and Social groups. The Social category is further subdivided into Labour, Human Rights, Society and Product Responsibility. Each of the three main categories has two types of indicators, namely Core and Additional indicators. These indicators should be reported while highlighting the trends in performance, observe GRI protocols and using metric units, and presented in a normalised and aggregate form. Below is the list of GRI Environmental Performance Indicators.

Environmental Performance Indicators

ASPECT: MATERIALS

- EN1** Materials used by weight or volume.
- EN2** Percentage of materials used that are recycled input materials.

ASPECT: ENERGY

- EN3** Direct energy consumption by primary energy source.
- EN4** Indirect energy consumption by primary source.
- EN5** Energy saved due to conservation and efficiency improvements.
- EN6** Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives.
- EN7** Initiatives to reduce indirect energy consumption and reductions achieved.

ASPECT: WATER

- EN8** Total water withdrawal by source.
- EN9** Water sources significantly affected by withdrawal of water.
- EN10** Percentage and total volume of water recycled and reused.

ASPECT: BIODIVERSITY

- EN11** Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.
- EN12** Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.
- EN13** Habitats protected or restored.

- EN14** Strategies, current actions, and future plans for managing impacts on biodiversity.
- EN15** Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.

ASPECT: EMISSIONS, EFFLUENTS, AND WASTE

- EN16** Total direct and indirect greenhouse gas emissions by weight.
- EN17** Other relevant indirect greenhouse gas emissions by weight.
- EN18** Initiatives to reduce greenhouse gas emissions and reductions achieved.
- EN19** Emissions of ozone-depleting substances by weight.
- EN20** NO, SO, and other significant air emissions by type and weight.
- EN21** Total water discharge by quality and destination.
- EN22** Total weight of waste by type and disposal method.
- EN23** Total number and volume of significant spills.
- EN24** Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.
- EN25** Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.

ASPECT: PRODUCTS AND SERVICES

- EN26** Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.
- EN27** Percentage of products sold and their packaging materials that are reclaimed by category.

ASPECT: COMPLIANCE

- EN28** Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.

ASPECT: TRANSPORT

- EN29** Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.

ASPECT: OVERALL

- EN30** Total environmental protection expenditures and investments by type.

Figure 4: List of Core and Additional Environmental Performance Indicators (GRI, 2006)

Core performance indicators are assumed to be relevant for *most* organisations and are defined as those which concern every group of stakeholders in companies, whereas Additional indicators are those representing emerging practises and those which may be relevant to some organisations but irrelevant others (GRI, 2006). Despite this distinction however, there remain a number of Core indicators which are not thought to be of particular concern to some organisations; for example the amount of water saved (EN8), protection of biodiversities (EN11 and EN12) and the amount of spills (EN23) may not be relevant to Banks and other Financial institutions, but of significant importance to Oil and Agricultural companies. Therefore, placing these factors as part of Core indicators, which are thought to be of universal stakeholder concern, undermines the rule that all adhering companies should report Core Indicators.

To that end, Boysen evaluated the extent to which the companies who claimed to adhere to GRI standards actually observed the guidelines in their sustainability reports. The study is conducted on the list of companies provided by GRI in 2007 (Boysen, 2009). Firstly, it is claimed that the majority of the companies in 2007 did not report on all of the GRI environmental indicators and that they showed “significant preference towards certain indicators”, despite the clear instruction by GRI that all indicators carry equal weight. For example it is reported that only 16% of the companies utilised all the GRI Core environmental indicators, and that 10 Core environmental indicators were used on average⁴⁸. Secondly, only 27% of the reports were externally audited (6% were verified externally, while 21% were checked by GRI), leaving 73% of the reports published with no prior verification. By publishing the unaudited reports, therefore, the GRI undermines its own preamble, namely to harmonise the global sustainability reporting standards.

Another area in which the GRI guidelines seem to lack is the segregation of stakeholders. It is clear that different companies in different sectors will have different stakeholders, who will have different needs and expectations from the company. The GRI guidelines include a rule called the Stakeholder Inclusiveness, which states that the reporting organisations should “identify its stakeholders and explain in the report how it has responded to their reasonable expectations and interests” (GRI, 2006). However there is no section on possible ways of segregating stakeholders according to different industries. Once stakeholders are identified, their reporting expectations could be categorised according to their interest. This view is also supported by Blowfield and Murray, who believe that one of the main shortcomings in sustainability reports is the exact way in which the company operations affect their stakeholders, and indeed what problems their sustainability strategies are aimed at remediating (2008). In terms of shareholders, for example, it is thought that any short-term concern for the environmental impact of the company is due to the effect such impacts may have on the long-term profitability of the company, and therefore the (potential) amount of dividends receivable. Perhaps implementing such changes to the GRI framework could help organising the performance indicators according to different stakeholder groups.

One other major source of deficiency in the GRI framework and its bundled application level grades is that these can be quite misleading. It follows that it is by no means true that a firm

⁴⁸ The GRI environmental indicators consist of 17 Core and 13 Additional indicators.

which has obtained an A+ application level grade invests more in sustainable business activities and development, compared to a firm which has obtained a B+ grade. This is particularly visible in the context of Chapters 4 and 6, where Firm A and Rio Tinto Plc. are examined as the subject of respective case studies. In Chapter 4, the subject matter is an industrial case study where a waste water treatment plant developed by Firm A has been installed in a factory in China which belongs to Firm B. The Chapter shows in detail the extent of improvements in key performance indicators such as water consumption and CO₂ emission. Firm A and its subsidiary companies have been at the centre of many other breakthrough technologies and processes. Yet, the group has obtained a B+ application level grade.

On the other hand, as Chapter 6 reveals, Rio Tinto Plc. is the subject of much criticism for lack of attention to social and environmental sustainability within the communities in which they operate. The firm is also under criticism for lack of transparency and alleged corruption internationally, particularly in China. A new reputational risk assessment tool is also introduced, called RepRisk in section 6.5.1 (below) which demonstrates the high risk facing the firm as a result of their unsustainable business practices. It is thought that institutional shareholders and other stakeholders would require information to that effect in order to learn about the adverse effect of such operations on the firm, as well as its stakeholders. Nevertheless, since Rio Tinto reports fully based on GRI criteria and externally audits these reports, the firm obtains an A+ application level grade. Such an anomaly could be viewed as problematic to shareholders and other stakeholders.

It is thought that the most important rules for using the GRI performance indicators are that they should be reported in a timely manner and depict the trends of the performance for each indicator. Publishing the performance trends in a timely manner will provide shareholders with a thorough insight into the traditions and the operations of the company, so that they are in turn able to make accurate decisions with regards the fate of their company. Ultimately, this will also reduce uncertainty in terms of the correct amount of disclosure, and thereby minimise the risk that directors face for being in breach of fiduciary duties.

A clear increasing trend is evidenced in the number of companies which publish sustainability reports. According to the KPMG's 2008 Sustainability Survey, 79% of the companies in the survey published standalone CSR reports, compared to 52% in 2005. The

2010 global report by PricewaterhouseCooper also supports such increasing trends (Guardian, 2010a). Nonetheless, while it is clear that institutions such as the GRI have made a significant contribution to the way in which environmental impact is reported, it is certainly wrong to assert that environmental impact is properly assessed in all its different forms and reported correctly and adequately. For example in terms of Carbon Footprint, 41% of the companies surveyed by KPMG in 2008 do not disclose such information at all, 48% disclose only for their own internal operations, and only 8% disclose it for their own operations and their value chain (KPMG, 2008).

Ultimately, an alternative system (which could be close to an almost ideal system) is perhaps one in which the impact of a company on their business, social or natural environments were measured in a single unit, which could then be translated into monetary values. This is thought to be the best way for shareholders and other stakeholders to evaluate the performance of their company and assess the risks posed to its future profitability.

3.8.2. Adequate Extent of Disclosure

The discussion thus far has focused on the lack of adequate legal guidelines on disclosure of environmental information. But how much disclosure is sufficient? The alternative system of reporting, as described above, depends upon the initial disclosure of operational data, market data and other such information, and their subsequent integrated analysis. The burden of providing such information lies with the company. However, in the absence of clear mandatory guidelines for sustainability reporting, it is thought that directors are constantly concerned with disclosing the adequate amount of information. On the one hand disclosing no information on environmental impact will lead to a breach of fiduciary duties and may result in reputational damage, *inter alia*. On the other hand, disclosing too much information may include the disclosure of sensitive trading secrets of the company, which may jeopardise the position of the company in the market. It is not untenable to think that this situation will also lead to a breach of s.172 of the Companies Act 2006, namely failing to act in the best interests of the company. Therefore directors will seek to find the middle ground between these two extreme sides of the spectrum.

Furthermore, companies usually incur some costs in the short-term in order to become more sustainable and thereby secure their long-term economic prosperity. There are numerous examples of companies which have invested in sustainable development measures and have

reaped the results of their investments soon thereafter. Examples of such measures include becoming more environmentally friendly by utilising fewer raw materials for the production of their products (for example, Marks and Spencer, Firm A, Firm B, Coca Cola). Conversely however, allocating too much of the available funds to becoming sustainable will inadvertently follow adverse consequences. Such consequences may include class legal actions, loss of market competitiveness, and ultimately loss of market capital.

The concept of ‘Diminishing Marginal Returns’ is an economic theory which seems to be applicable to the current situation. The rule states that “as variable inputs increase, with other inputs fixed, a point will be reached where the additions to the output will eventually decline” (Sexton, 2008). In the context of sustainable business development, this point could be shown using the graph below. The x-axis represents long-term real economic success and the y-axis represents costs incurred for becoming more sustainable.

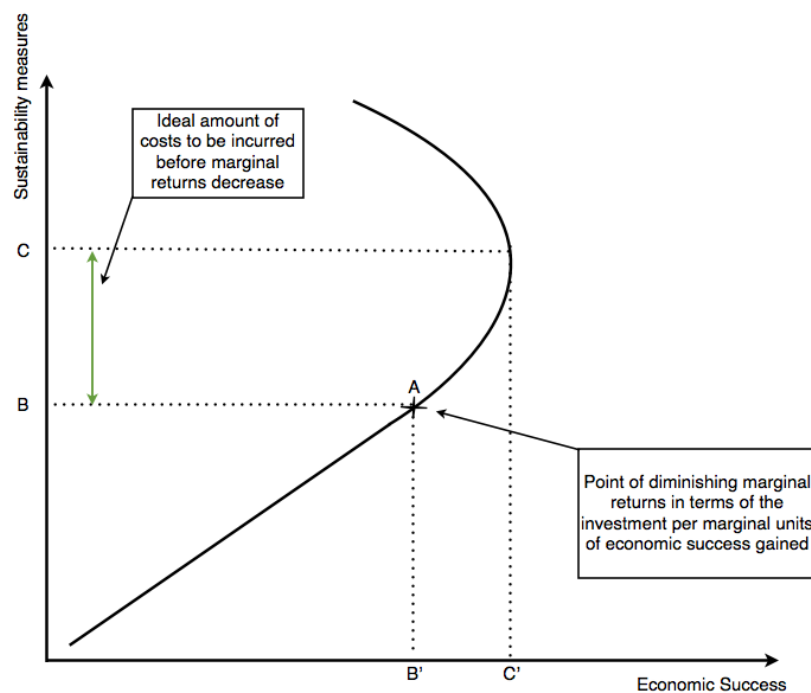


Figure 5: Relationship between investing in sustainability measures and long-term economic prosperity

The graph shows that from point A on the curve onwards, marginal long-term economic prosperity decreases the more investment is made towards sustainability measures. This will continue until point C, beyond which economic success actually falls as more investment is made towards sustainability measures. Hence investing in sustainability measures until a cost equivalent to point B on the graph will theoretically have a direct result on economic success.

From a cost equivalent to point B until point C is where marginal economic success falls per unit increase of investment.

Therefore on any point on the graph before reaching the cost level B, there remains a risk of litigation by institutional and / or majority shareholders (albeit realistically with a narrow probability), since the company will still profit from a rise in investment on becoming more sustainable. There is also a risk of litigation if the company invests more than the amount equivalent to point C, since in that case the long-term interests of the company are jeopardised (note the requirement of s.172 Companies Act 2006). Therefore it is asserted that the distance between points B and C represents the ideal amount of investment on sustainability measures. Hence a cost equivalent to point C is where the courts should draw the threshold for the amount of disclosure and sustainability measures.

It should be noted that in the above graph the exact position of points A, B, B', C and C' are not known, since they will be highly dependent on each company's individual circumstances. Furthermore, the gradient of the line leading to point B is thought to depend on the industry in which the company operates. The graph also does not account for the extent of competition in the market in which the firm operates.

3.9. Conclusions

It has been shown that there is adequate legal basis for corporate environmental disclosure in the legal systems of the European Union, the United Kingdom and the United States. It has also been demonstrated that an international tendency to require firms to publicly acknowledge and remediate environmental damage caused by their business activities is gaining momentum. Therefore there is a need for a paradigm shift in the area of corporate governance in order to include rules with regards to the disclosure of non-financial (namely environmental) information.

It follows that in order to achieve the greater objective of sustainable development through firms the corporate culture in relation to governance must be amended. Although there is evidence to this effect in the market place (as stated), it is shown that regulations must also be amended to require a greater extent of environmental information for the benefit of institutional shareholders and other influential stakeholder groups.

Clear provisions are made in the United States for corporate environmental disclosure which will place shareholders in a better position in terms of their financial planning compared to other jurisdictions examined in this Chapter. This, however, is not to say that the law in the US is clear in terms of the exact amount of information required for disclosure, and indeed the extent of their relevance.

Furthermore, the law in England and Wales, if not the European Union, lacks clear provisions with regards to disclosure of environmental impact. It is also shown that despite the apparent lack of such provisions in the newly enacted Companies Act 2006, several governing bodies were in favour of such a section in that Act. At the same time, however, the majority of the parties which were consulted by the Department for Business, Innovation and Skills were of the opinion that company directors already had adequate incentive for accurate reporting of such data and information. In absence of regulatory reform in this area it has been stated that fiduciary duties can potentially be utilised in seeking thorough disclosure of the company's environmental impacts.

Evidence of current lawsuits clearly demonstrates the utility of fiduciary duties as a feasible device for enforcing the disclosure of environmental information, where such information has been withheld from shareholders. As such, the rules created in Chapter 7, namely rules 1.1 to 1.7, have been designed in order to address these deficiencies in law and in the frameworks produced by market intermediaries. Rules 1.1, 1.2, 1.3 and 1.5 have been directly drawn from the findings of this Chapter.

Concurrently, markets should benefit from appropriate regulatory measures which actively impose a legal obligation to disclose environmental information. The Aarhus Convention is only a step away in the sense that such information must be made available, in any event, upon request where it is already a matter of record as between firms and environmental regulators. It is submitted that the future step of corporate reporting upon environmental information-related disclosures on a voluntary basis through Annual Reports (if not by even more current means on corporate web sites) may well be an appropriate outcome in the implementation of this Directive. On this note, firms should note the comfort to be derived from the clear exceptions from disclosure that are already well-established in access to information legislation as it is found in a majority of European Union Member States. The next Chapter follows from this discussion by demonstrating how the communication of

technology-based opportunities with a customer in a collaborative process provides both trust and mutual commercial advantage, and how this will ultimately provide a step closer to the objective of sustainable development by firms and associated industries alike.

4 ENVIRONMENTAL SUSTAINABILITY

Chapter 4: Sustainable Technologies for Wastewater Treatment: Case Study of Firm A and Firm B

4.1. Introduction

This Chapter is in the form of a case study which demonstrates two firms' efforts in engaging in a business transaction which involves the exchange of sustainable technologies and integrated services from one firm to another, namely Firm A and Firm B. The main objective of this Chapter is to accurately demonstrate that using the Best Available Technology (BAT, as referred to by the Industrial Emissions Directive of 2010) is a crucial step in the path of sustainable growth and development. In terms of the sustainability debate as a whole, the main benefit of Firm A's Wastewater Treatment Plant (WWTP) installed for Firm B falls within the environmental pillar of sustainability. This Chapter will examine the full benefits of said WWTP in terms of its environmental impacts.

Some of the resources relied upon for the production of this Chapter (which was originally a case study) were provided by Firm A as part of corporate information, which are unpublished and therefore cannot be accurately referenced. These include many spread sheets, graphs, charts and data logs which have been analysed for the purposes of this thesis. The Chapter illustrates that developing and applying water and carbon foot printing methodologies as part of an environmental sustainability pillar rule-based system can lead to success related to the financial performance of said firm.

In 1746 Benjamin Franklin stated that “[w]hen the well is dry, we know the value of water” (EPA, 2012a). Over the next 20 years, global demand for water is projected to rise by 40% (ERD, 2012). Water scarcity is likely to present difficult challenges for the global population and businesses in the long run. Access to fresh water could soon be the number one limiting factor to growth around the world. The statistics below present a glimpse into the extent of resource scarcity that the world is facing (WEC, 2010).

0.5% of fresh water is accessible for direct human use
40% is the projected increase in global freshwater demand by 2030
37% of the world will be in water stress by 2020
4.8 billion people will be in regions facing water limitations by 2050

Yet it is important to remember there are opportunities ahead, as well as challenges. For industry, improvements in carbon and water efficiency are a chance to reduce costs, save energy, improve reputation and become more sustainable. As explained further in Chapter 7, conducting sustainable business activities will also help to mitigate environmental and associated economic risks locally and throughout the supply chain.

This case study is an example of the achievement of such improvements in water consumption and carbon emissions on a technical scale. It demonstrates the way in which Firm B is developing a world-class wastewater treatment plant for its manufacturing base in Suzhou nearby Shanghai, China, whilst helping them improve efficiency and meet their

sustainability goals along the way. It also explains how Firm A helped in developing wastewater solutions that provided better treatment quality, which also reduced the plant's carbon footprint and its impact on freshwater resources. Furthermore the Chapter explains how Firm A's new water "foot printing" tool, namely the Water Impact Index (WII), helps in a comprehensive and pragmatic way in a decision making process for sustainability.

It is to be noted that the case study below was conducted on behalf of Firm A for the consumption of their employees, stakeholders and future customers. As such, the current Chapter is shorter than the other substantive Chapters and at times the format of this Chapter may seem out of sync with the rest of the thesis. Appropriate changes have been made to the original version of this case study for the purposes of this Chapter. The justification behind conducting an industrial-based case study for the environmental pillar of sustainability is that it will help demonstrate real (almost tangible) improvements in the environmental performance of the project involved. In this chapter, it is submitted that supplementing conventional social science methodologies with a tool-specific empirical case study yields added value.

4.2. Firm B

Firm B's manufacturing plant is located at Suzhou in Jiangsu Province. It produces multiple products such as shampoo, skincare and cosmetic products for Firm B's Asian market. The factory treats its wastewater through a Wastewater Treatment Plant (WWTP) with a capacity of 30 m³/day (Firm A). In 2010, Firm B commissioned Firm A to upgrade the design of this plant (Environmental Leader, 2011).

Upgrading the wastewater treatment plant was a chance to make substantial savings in terms of carbon emissions, water consumption, and indeed in production costs. The operation of WWTPs is energy-intensive due to pumping and aeration as well as the production and transport of chemicals. In many places, energy costs can be as high as 60% of a typical WWTP's operating cost (Tchobanoglous et al., 2003, LuxResearch, 2009). Treatment also produces sludge that needs to be treated and disposed of. What's more, in China these costs are predicted to increase due to higher quality standards, a growing population and economic growth. In the case of Firm B's plant, ageing infrastructure also meant it was consuming a relatively high amount of energy for the water it was treating (Firm A).

At the same time, despite being next to Tai Lake, China's fourth largest lake, the industrial nature of Suzhou means it is an area that already suffers from problems of water stress and water quality (Kahn, 2007). As demand for products of Firm B in Asia rises, demand for production at the plant is projected to rise (Firm A). Ensuring that the plant uses water efficiently and without compromising local water quality was another key priority for Firm B.

Firm B

"[Firm B] has been a signatory to the UN Global Compact (UNGC) since 2003 and we remain committed to its 10 principles" – CEO of Firm B

Firm B is the world's leading cosmetics group. It's rated among the world's top 100 responsible and ethical companies. It is also listed in all the major sustainable development indices, including the Dow Jones Sustainability Index, FTSE4 Good, ASPI Eurozone and Ethibel.

Firm B's Corporate Sustainability targets for 2015 are focused on a 50% reduction in energy, waste, water and carbon footprint for all their manufacturing sites, based on benchmark levels of 2005.

4.3. Reducing Carbon

Firm A

"Our vision is to be the benchmark for sustainable growth" CEO of Firm A

Firm A is the world leader in water and wastewater services, and a specialized provider of technological solutions in water treatment.

"[Firm A] has focussed on providing carbon-efficient industrial water solutions for several years. With that in mind, assessing the carbon footprint of proposed solutions is a fundamental part of our decision process when selecting and bundling the most efficient technologies. Our leadership and responsibility commitment also led us to go further than simplified volumetric water footprint approach with the launch of our Water Impact Index (WII). A sustainability decision-making tool, it provides a better understanding of the environmental and economic risks attached to the water challenge specific companies face." CEO of Firm A's Water Subsidiary Company

4.3.1. The Challenge

One of Firm B's key sustainability targets for 2015 is to reduce the firm's overall water consumption together with the carbon footprint of each of its factories by 50%, compared

with 2005 values. It was essential that Firm A would not only provide improved water treatment, but also contribute to the site's carbon-footprint reduction (L'Oréal, 2011).

4.3.2. The Solution

Firm B's existing wastewater treatment infrastructure is made up of a conventional and ageing Dissolved Air Flotation system. The sludge and high concentrated liquid waste treatment and disposal are outsourced for processing. The sludge is then burnt in the local incinerator. The result is relatively high Greenhouse Gas Emissions due to operational inefficiencies (due to the plant's age), transport of waste for disposal and sludge incineration (Firm A).

To remedy this, Firm A has been producing carbon-efficient solutions for some time. Firm A's suggested plan was to replace the existing infrastructure and add two new pieces of carbon-efficient systems (benefiting from the latest technologies) upstream of the existing activated sludge reactor. These were a *Biobulk*[®] CSTR and an *AnoxKaldnes*[™] MBBR (*Ibid*).

***Biobulk*[®] CSTR (Completely Stirred Tank Reactor) anaerobic treatment**

A Biobulk CSTR increases the anaerobic degradation of pollutants thanks to a reactor that constantly mixes the influent. This mixing increases the contact with microorganisms, which results in a higher degradation rate and higher biogas production.

***AnoxKaldnes*[™] MBBR (Moving Bed-Bio-Reactor) biofilm carrier**

This is a biofilm carrier on which microorganisms grow. The sewage is then passed over it. Thanks to the large surface area of this MBBR carrier, the growth rate of microorganisms is increased. As a result, pollutant degradation is increased. Thanks to the material of the biofilm carrier, it also resists clogging and toxicity.

This solution results in the WWTP using less energy and producing fewer Greenhouse Gas (GHG) emissions, as such:

- By increasing microbial activity, more pollutant is removed using the same amount of energy compared to the existing plant;
- Less sludge is produced; and the sludge that remains is used for creating biogas and fertilizer;
- Fewer chemicals are required for treatment, as the size of the equipment is better matched to the volume of water to be treated; and

- Biogas is an energy source with great potential given the number of possible sources available and the option to produce fuel from domestic waste. Consideration must be given to how it is produced. When biogas is produced from coal, the GHG emissions created during the gasification process and then the creation of electricity from the biogas are considerable. The air quality and health effects of coal ash are also negative aspects which merit strategic consideration, given the use of (biogas from) coal could more than cancel out any savings from the installed plant.

4.3.3. Measuring Performance

Firm A provided a carbon footprint analysis in order to show how much carbon saving the solutions would generate. To do this, a conventional carbon foot printing method that follows the GHG Protocol Initiative was used. Thus, the carbon footprint of the current wastewater plant was measured so as to obtain a baseline against which to compare the new designs. For each system scopes 1 and 2 as well as the emissions from various other operations (measured in CO₂-equivalent) were covered:

Scope 1: GHG direct emissions from the plant – mainly company-used vehicles, freight and sludge incineration

Scope 2: Indirect GHG emissions from electricity use – the most energy-intensive part of the plant is pumping

Scope 3: GHG emissions related to operations like the production of chemicals, employee travel and other indirect water consumption

The emissions from scope 1 and 2 are useful to assess responsibility against GHG emissions. The emissions from scope 3 are interesting to assess as a risk management tool for vulnerability against the carbon constraint (both climate change and hydrocarbons scarcity) over the supply chain.

4.3.4. Results

Based on the pilot test results, Firm A's suggested⁴⁹ solutions would provide 75%⁵⁰ reduction in chemical consumption and 52% reduction in sludge (because bulk waste would be treated

⁴⁹ The author does not claim to be aware of the exact methodology by which the experiments noted above have been conducted; the assumption is that said experiments are accurate and have been verified scientifically.

on site). These reductions have a significant positive knock-on effect on the WWTPs treatment efficiency and carbon footprint. The following are explanations of these benefits.

4.3.4.1. 26% improvement in quality of water output by the WWTP

It is important to remember water treatment is the primary purpose of the plant. Quality improvement is in addition to the carbon savings below, showing one doesn't compromise the other. The Chemical Oxygen Demand (COD), which reflects the amount of non-degradable pollutant, was high due to chemicals used to produce shampoo, and was reduced by 26%.

4.3.4.2. 35% reduction in GHG emissions (23% for scope 1 and 2 only)

Such reductions in GHG emissions are largely because treating bulk waste on site eliminates emissions from transporting and burning this waste in the local incinerator.

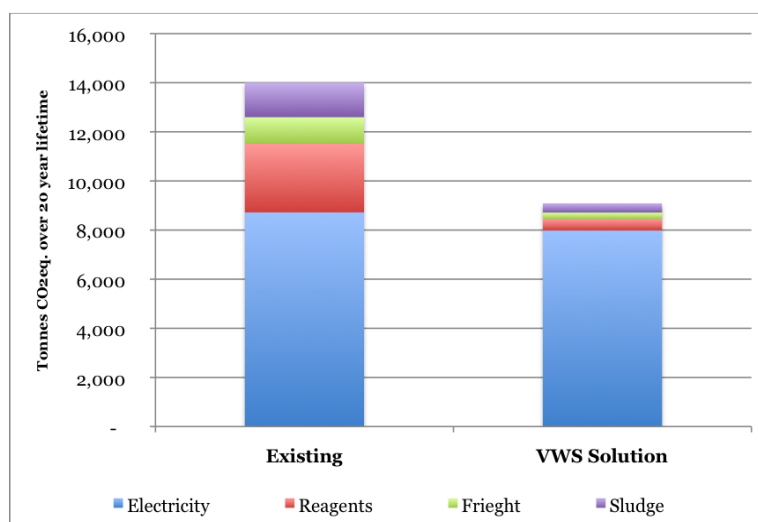


Figure 6: The installation of CSTR and MBBR technologies means the carbon footprint of Firm B's wastewater treatment plant could be reduced from 14,000 to 9,000 CO₂ equivalent

4.3.4.3. 52% improvement in the carbon efficiency of the actual water treatment (43% for scope 1 and 2 only)

This is measured by the reduction in GHG emissions required to reduce the abstracted water's COD to local quality standards. As such, one unit of COD removed emits less GHG with the new technologies compared to the conventional system (i.e. existing).

⁵⁰ At the time of drafting the current Chapter, these results had not been tested on the installed plant and thus not verified.

Carbon neutrality for Wastewater treatment: Myth or Reality?

A significant advantage of BioBulk CSTR technology is that it allows sludge to anaerobically digest in a sealed environment. The resulting biogas can then be used to generate heat or electricity, thereby reducing demand from the grid.

Biogas generation through the WWTP has been successfully produced throughout the world. Firm A has been producing biogas through such technologies for customers from different sectors and locations. One of their best references is a plant with a pulp and paper company in Germany, *Schoellershammer*. There, the emissions avoided through biogas production are equivalent to more than 100% of the plant's total direct and indirect GHG emissions (Scope 1, 2 and 3) over its lifetime.

4.4. Reducing Water Impact

4.4.1. The Challenge

Carbon-efficiency is an essential step for upgrading the existing WWTP. But in the face of growing demand for fresh water, the second-most important challenge for businesses is reducing their *water impact*. Changes in water quantity, quality and scarcity can pose serious risks to businesses, such as increasing costs, threats to production and reputational damage. This is especially true in water-stressed areas like Suzhou, China. Firm B has acknowledged this challenge by commissioning Firm A to upgrade their WWTP, and by setting the 2015 goal referred to earlier.

For responsible industries it is critical to minimise the pressure on freshwater but it is also essential to have a WWTP which meets good ecological standards as it will have a very positive impact on the water cycle and local ecosystem. In the current markets, decision making tools for water management are critical to help industries integrate all the complexity of water when assessing integrated solutions.

4.5. The Water Impact Index (WII)

The Water Impact Index is Firm A's new foot printing tool, designed to help decision-makers assess water risks. It measures the essential elements of an industry's impact on fresh water, including the quantity of water used, the level of stress on relevant water resource, resource type and the overall effect of this use on water quality.

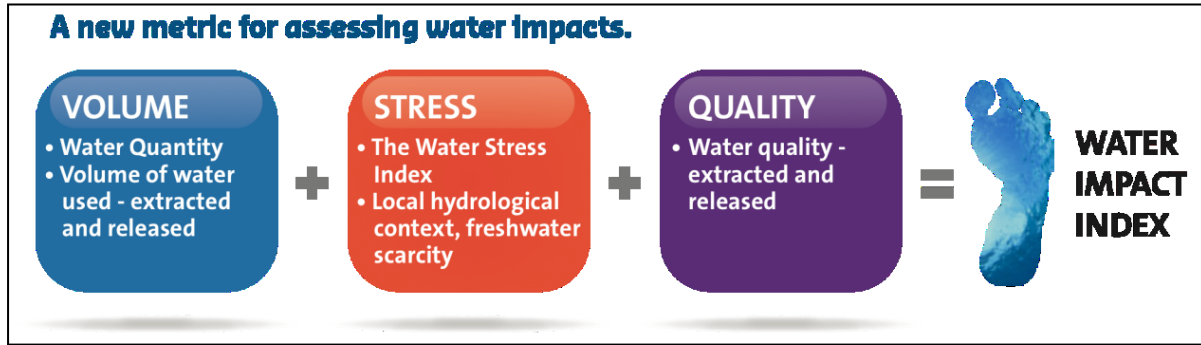


Figure 7: Diagram of the components of the WII formula (Firm A)

While WII is not the first water accounting tool to be developed, it is the first to integrate *all* these complexities, namely water quality, volume and stress levels. Factoring in all these complexities will help decision-makers develop a deeper understanding of their water impact. The hope is it will help all affected parties make informed choices about effective water management.

4.5.1. The Components of WII

The three-part WII formula takes the following factors into account:

- **Quantity:** WII compares the amount of water withdrawn from freshwater bodies and released back to the environment after use.
- **Scarcity:** WII uses Pfister's Water Stress Index (WSI) to put a plant's water use into local context. This part of the formula considers water use to availability ratio, along with the seasonality and the storage capacity of freshwater. A high WSI (minimum 0, maximum 1) means the area is an area of high water stress.
- **Quality:** WII compares water withdrawn and released, both as a ratio of the local water quality standards. A high ratio means that the quality of water withdrawn or released is very good. In a standard situation, the quality of water withdrawn is good but the quality of water released after use is altered.

4.5.2. The WII Equation

The mathematical equation of the Water Impact Index is as follows:

$$WII = \sum_j \left(W_j \times \min_1 \left(1; \frac{C_{refl}}{C_{j,l}} \right) \times WSI_j \right) - \sum_k \left(R_k \times \min_1 \left(1; \frac{C_{refl}}{C_{k,l}} \right) \times WSI_k \right)$$

Where:

- C: The concentration of the strongest identified pollutant (such as COD, BOD, TKN, Pt, SS, DS, pesticides or metals) in either the water abstracted or released (mg/l)
- Cref: The reference concentration that should be reached in the water resource to ensure a good ecological health (for example, Water Quality Standard – US EPA) (mg/l)
- W: The volume of water withdrawn from a freshwater body
- R: The volume of water released back into a freshwater body after usage
- WSI: The Water Stress Index reference (for water withdrawn and returned)

The WII formula will indicate a high result if the first part (encased by green box) of the equation is significantly larger than the second (encased by red box):

- If the first part high, the volume of water withdrawn is high, and/or the quality of water abstracted is high, and/or the area is highly water stressed; and
- If the second part low, the volume of water returned is low, and/or the quality of water returned is low, and/or the area where the water is returned is water abundant.

Ideally the formula will indicate a low result, which would be the case if the first part of the equation is only marginally higher than the second (or if both are low). It follows that:

- If the first part is low, the volume of water withdrawn is low, and/or the quality of water abstracted is poor, and/or the area where is withdrawn from is water abundant;
- If the second part is high, a high proportion of water is returned (volumetrically), and/or the returned water quality is high, and/or the area where the water is returned is water scarce.

On a scale from 0 to 1 (1 being a high scarce area), the Water Stress Index in Suzhou region is equal to 1 (Firm A).

4.5.3. Beyond Volume: The Importance of Water Stress

In a recent study the water impacts of two products were considered – Dolmio® pasta sauce and Peanut M&M's® (Ridoutt and Pfister, 2010). In terms of sheer water use, the production of peanut candies required six times more water than the production of tomato sauce.

However, taking account of water stress, the opposite was found to be true: the impact on water sources of tomato sauce is 10 times greater than that of peanuts, because tomatoes need more fertilizer and irrigation and are produced in water-stressed areas. As such, it is important to find new methods for accurately comparing products, production systems and services in terms of their potential contribution to water scarcity (*Ibid*).

4.5.4. Direct and Indirect Water Impact Index

Virtual water, hidden water, embodied water and water footprint are just a few of the expressions designated to a function that attempts to assess the volume of fresh water used directly and indirectly to produce a product over various steps of the value chain.

For instance, it is known that approximately 10,991 liters of water are required to make one pair of blue jeans (Shafer and Pinero, 2011). But the impact on a given freshwater resource, such as a reservoir, lake, river etc., is unknown.

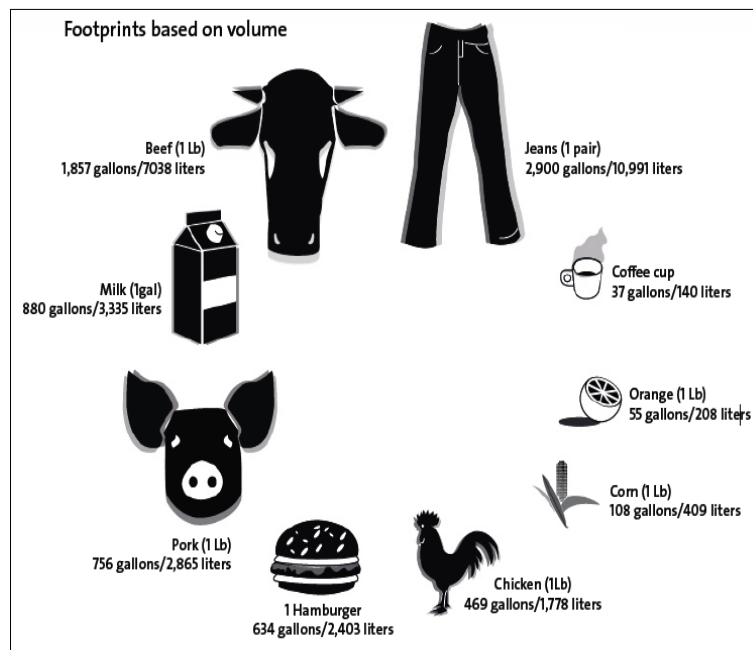


Figure 8: Water footprints based on volume (Shafer and Pinero, 2011)

As explained above, solely focusing on the volumetric measure of how much water is used in production is misleading. As such, when calculating the Water Impact Index a lifecycle perspective is used. That is to say both the direct and the indirect water consumption are taken into account. Calculating the direct water impact is done by utilizing the Water Impact Index equation, which is a simple task when data is available (Firm A). In theory this would

have to be done for every indirect process which could be very time-consuming especially during a tender process. Therefore in order to collect data, Firm A uses many databases which include information on the water consumption of different processes⁵¹ (Firm A). The figure below serves as an example to demonstrate the large effect indirect water index has when calculating the total water footprint of any given final product: the product in this example is a malt based beverage.

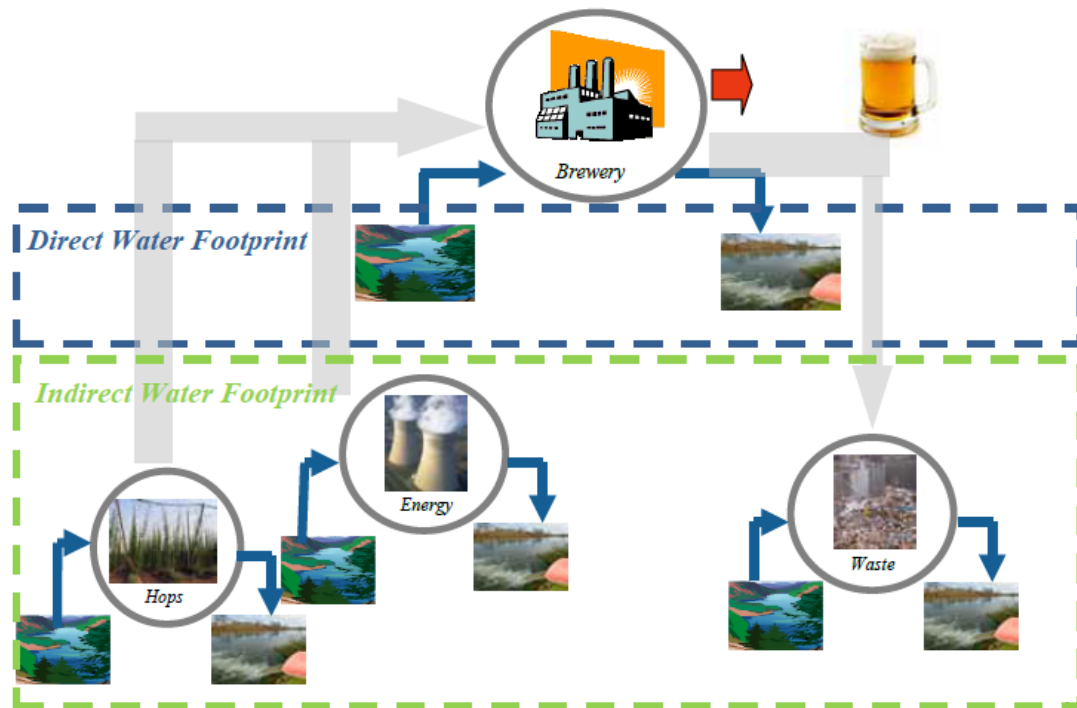


Figure 9: Direct and Indirect Water Impact Index (Firm A)

As explained above, the technologies utilised by Firm A such as Biobulk[®] enable said WWTPs to produce biogas from the residual sludge. Utilising green energy sources such as biogas in carbon-intensive industries (for example coal power plants) will have a significant impact on the indirect water use and carbon emission of power generation from coal. Taking into account the effects of indirect water used throughout the value chain in different industries is an innovative method of water impact indexing.

⁵¹ Databases include: ADEME, ICE, EcoInvent, GHG Protocol, National greenhouse accounts factors from Australian Government, European Life Cycle Database, EPA US, etc. There are difference between the data collected by these databases, but the ratio of data and the magnitude of change and the conclusions as to the sources of GHG emissions are always the same. This enables harmonisation of data.

4.5.5. Going Further With Reuse Technology

Using technology such as ActifloCarb® could have a strong impact on the reduction of the Water Impact Index. ActifloCarb® is a process which further enhances water treatment via flocculation and powdered activated carbon, in order to increase filtration efficiency and the removal of more impurities not removed via clarification, using less water and chemicals in the process, and so reducing the water impact overall (Firm A).

ActifloCarb® – the ultimate clarifier

The process involves a high-rate clarifier that uses microsand for rapid coagulation and flocculation. The weight of flocs encourages rapid settlement. This allows an attractive short-term retention time. In addition, the ActifloCarb® features a PAC (Powdered Activated Carbon) pre-contact tank for the adsorption of pollutants. PAC has a micro-porous structure that physically adsorbs water pollutants, resulting in high quality water.

This reuse technology can potentially treat the incoming wastewater and provide high quality water that can be used for any purpose, such as being fed back into the drinking water supply. Reusing wastewater will result in lower freshwater withdrawal from water bodies and reduce water scarcity. The figure below is a diagrammatic illustration of the added processes (reuse technology) to the existing WWTP through which CO₂ emissions and water consumption has decreased.

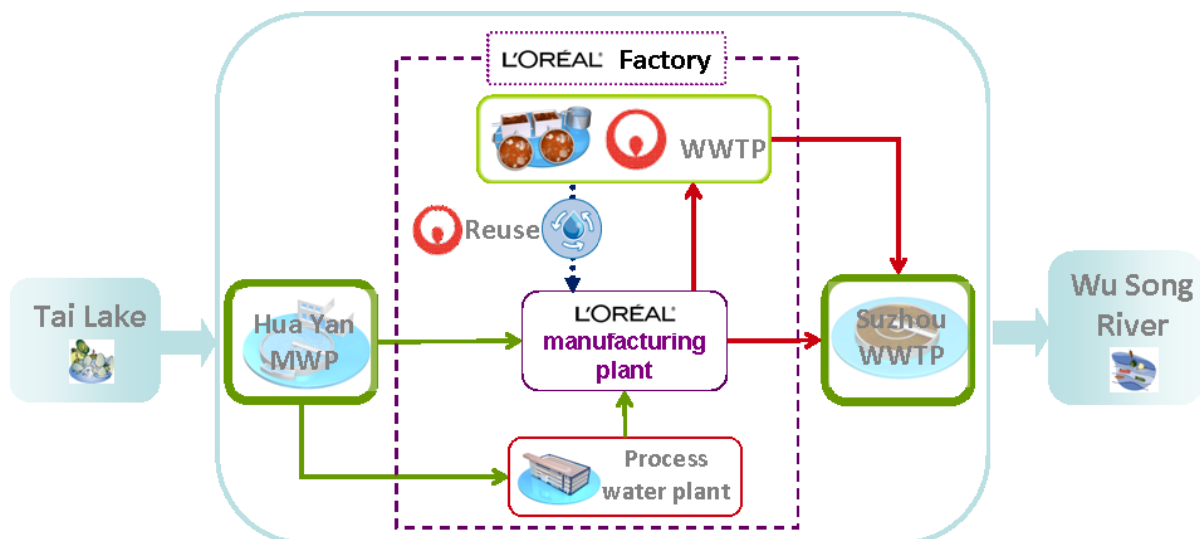


Figure 10: The full process cycle of the WWTP (Firm A)

The full water cycle starts at Hua Yan municipal Water Plant extracting Tai Lake water to produce drinking water. Firm B uses drinking water as well as pure water produced by Firm A Process Water Plant. High Concentrated Liquid Waste (high COD loaded wastewater) is treated at Firm B's upgraded WWTP. The effluent is treated at Suzhou municipal WWTP, and finally released into the Wu Song River (Firm A).

4.5.6. Multiple Applications

WII has is not solely utilised in industrial projects. The process was successfully implemented for the first time in the urban water cycle of Milwaukee municipality, which served 1 million persons a day (Milwaukee Public Television, 2010, Shafer and Pinero, 2011). The new design assessed the interaction of carbon (energy) and water and their associated economic and environmental impacts. Attributing a value to water based on quality, volume and stress led to a paradigm shift in benchmarking water and air impacts from different activities throughout the world (Firm A).



Figure 11: Industry WII assessments currently planned or in progress around the world (Firm A)

4.6. Adding Value and Risk Management

Notwithstanding the above, whilst water and carbon footprints are important, it is necessary to consider the financial implications of investing in sustainability measures. Environmental standards accompanied by financial savings are key drivers of innovation.

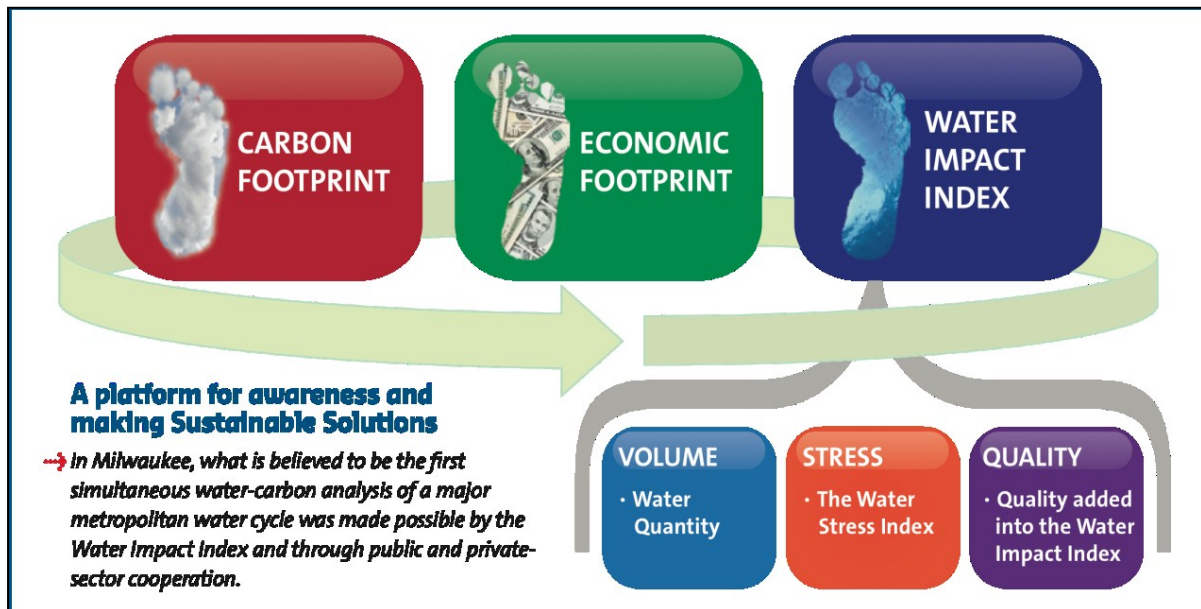


Figure 12: Financial implications of reductions in carbon and water footprints (Firm A)

It is necessary to consider future prices for the resources utilised today, especially when examining installations whose life cycle is projected to be approximately 20 years. One of the key challenges for decision makers is balancing operational cost savings in relation to the cost of installation. Net Present Value (NPV) is the main accounting decision making tool which firms take into account before deciding if a project should be initiated or not. The method looks at valuing capital expenditure options at operations by calculating the present value of an investment's future cash flows less the cost of the project itself.

Improvements in operational efficiency are expected to result in a reduction of operating costs, such as those associated with water consumption. As a result of installing MBBR and CSTR technologies, the total operating costs in BeautyCos' WWTP were reduced by 35% - excluding the costs associated with reuse technology (which significantly increases chemical usage), water price and carbon price. If the cost of water and carbon are taken into account the overall reduction in operational expenses will reduce by 25%. If however, the original WVS proposal together with the reuse technology is utilised, the operational cost of the plant

(excluding water price and carbon cost) will increase by 46%; whereas if water price and carbon costs are included, the overall operational costs will only increase by 26% (Bachelay and Laget, 2010). This suggests that if the reuse technology were added to the original WWPT design, overall operation costs would rise by 20%, which represents the costs resulting from the plant's inefficiencies.

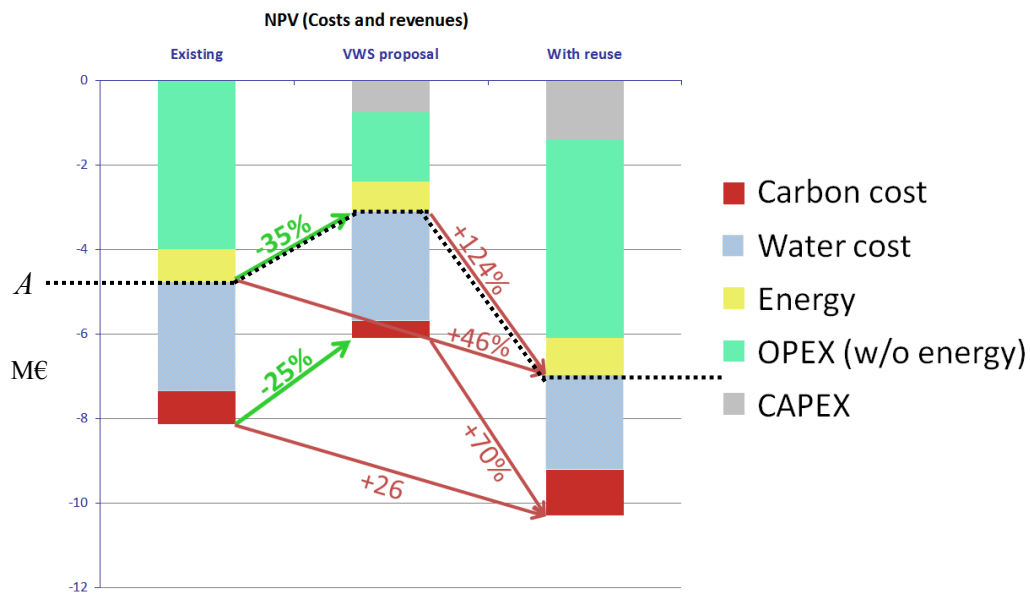


Figure 13: Comparison between different changes in Net Present Value (Bachelay and Laget, 2010)

The figure above depicts the difference in NPV change when excluding projected and actual water price and carbon cost to the three projects. The values above the dotted line 'A' represent the exclusion of water and carbon costs from the NPV calculations, and below the dotted line is where they are included in the calculations.

MBBR and CSTR technologies improve the efficiency of the plant in terms of material and energy use. Therefore, non-water operational costs are reduced by as much as 79%. When the ActifloCarb technology is also included, chemicals requirements increase dramatically and as a result the non-water operational costs increase by 11%; although this increase is counterbalanced by the reduction in the expenditure on water.

4.6.1. Energy and Carbon

In 2008 Firm A performed a full carbon footprint analysis of its portfolio of technologies and products showing that the main sources of emissions are mainly from the energy and

chemicals consumptions. It therefore follows that investing in carbon efficient solutions would significantly reduce the operating expenditures.

Carbon footprint analysis is not only a method to assess corporate responsibility in relation to greenhouse gases emissions and climate change; it also allows for the evaluation of vulnerability of said firm against hydrocarbon scarcity, especially when integrating indirect emissions. Firm A's new WWTP has been estimated to benefit from a life cycle of 20 years. During these 20 years, Firm A predicts that the price of hydrocarbon energy sources such as oil will increase up to US\$250 per barrel (Clere and Laget, 2011). Such predicted rises in the price of oil, if true, will significantly increase the costs of production for energy-intensive firms (exacerbated when considering costs associated with carbon tax levy).

4.6.2.1. Energy Price Forecasts

Forecasting the price of energy is difficult due to market volatility and increasing number of innovations aiming to provide an alternative source of fuel (for example, the revolution in shale gas in the US and Europe in late 2012 and early 2013).

Firm A estimates that the price of oil will increase by average 4% annually. Based on the current price of oil and its associated carbon emissions Firm A has modelled a carbon price. Using current knowledge of the GHG emissions of BeautyCos' operations, this price was extrapolated over the lifetime of the project. This method highlighted improvements in energy efficiencies. However the effect of changes in energy price was not included in the factory's Scope 2 emissions.

4.6.2.2. Water Price Forecasts

A water price forecasts has not been made by Firm A for the plant in Suzhou. In the absence of these forecasts, Firm A calculated how quickly water prices would have to increase for the NPV of the upgraded project to be the same over the plant's lifetime.

If this calculation is made with the reuse proposal, water prices would have to increase by approximately 65% over the 20 year lifetime of the plant, which is equivalent to an annual growth rate of 3.25%. This figure is realistic given the trends seen in OECD countries: in the first half of the 1990s, household water prices in OECD countries grew by an average of 4.06% annually (in Hungary it increased by almost 19% every year over a ten-year period)

(OECD, 2010). Over twenty years, this is the same as an overall growth in water prices of over 81%.

Environmental Externalities and Shadow Pricing

One of the key challenges with driving sustainable water use is that the price of water does not reflect its true value as a good. Shadow prices provide a suitable index of a resource's value by not only reflecting the arbitrary price of the resource but also revealing its demand and supply situation – the market equilibrium price (Economist, 2013). It provides an opportunity to calculate a resource price when its market price does not reflect its true opportunity cost.

Only recently have academics tried to include environmental opportunity costs in shadow prices. Doing this requires placing a monetary value on the opportunity lost in the use of water, a complicated issue. Even so, this field of resource valuation is coming on in leaps and bounds.

4.7. Conclusions

Many large and multinational enterprises, especially manufacturers are seeking to incorporate sustainability strategies into their overall corporate strategies. As stated and explained in other Chapters of this thesis, sustainability requires a holistic approach coupled by a process of continuous improvements. As such, it is important to heed the requirements for reducing carbon emissions, though not at the expense of water resources. The solutions created by Firm A aims to provide integrated solutions that help companies manage their environmental challenges as a whole.

As this case study shows, these solutions can help forward-thinking companies improve the quality of their water treatment plants, reduce pressure on water scarcity, cut greenhouse gas emissions, while reducing their operational costs as well. However it is noted that the message that the current Chapter is attempting to convey is not that environmentally sustainable strategies are limited to those implemented in this case study; rather, this case study merely provides an example of such strategies. It follows that the corporate collaboration above is taken as evidence of good practice, and that other similar collaborations would also benefit the firms involved in terms of conducting business activities in line with the inherent rules of sustainability. The successful examples created in the collaboration between Firm B and Firm A can be replicated in other industries, provided that adequate investment is made into research and development. In doing so, it has been

shown that both of the firms involved have also benefited financially from incorporating best available techniques in their operations. This shows the benefits of implementing rules-based systems by both regulators (i.e., BAT - Industrial Emissions Directive, Water Framework Directive, Carbon Reduction Commitment schemes) and companies (Firm A – Firm B).

The findings of this Chapter are taken as evidence of good practice in the manufacturing and industrial utilities sectors; to that end, this Chapter is used to derive rules pertaining to environmental sustainability in Chapter 7. In line with the findings of this Chapter, rules 2.1, 2.2 and 2.6 in Chapter 7 focus specifically on water management; whereas the remaining rules in relation to environmental sustainability can be applied more broadly. Nevertheless, it is stipulated that all of said rules (i.e. 2.1 to 2.9) can be applied to industries where other aspects of environmental management are more pressing compared to water management (for example, water scarcity and management may not be a prevalent matter in firms within the financial sector).

This Chapter, which was originally conducted as a case study in summer of 2011 is the first document to explain the technical aspects of the biological wastewater treatment plant installed in Firm B. Since then, Firm A has increased its investment into publicising the success of said plant. Most of such publication has occurred during 2013 in specialised conferences and establishing new websites containing video presentations. A newly produced video presentation of the application of WII in Milwaukee and in Suzhou has been produced by Firm A and posted online. Chapter 5 follows from this Chapter in discussing the positive economic implications of clarifying environmental regulations whose objectives are to protect human health and the environment. In this case, the Waste Framework Directive of the European Union is discussed in line with the company's risk reduction strategies; the company in question is Firm C.

It is noted that the author was not involved in conducting the experiments stated above and as such cannot verify their accuracy. However, given the international reputation of the firms involved and the results achieved in other industrial plants elsewhere, it is assumed that said experiments and the results thereof are accurate.

5

ECONOMIC SUSTAINABILITY

Chapter 5: Legislative guidance on the new Waste Framework Directive

5.1. Introduction

Section 172 of Companies Act 2006 (England and Wales) states that directors of a publicly listed company in England and Wales should act in the way which they consider, in good faith, would be most likely to promote the success of the company for the benefit of its members as a whole. In doing so, they should have regard, *inter alia*, to the impact of the company's operations on the community and the environment (Companies Act 2006, s.172(1)(d)). It is inferred from the general language used in this subsection that "success" of a company as a whole is not solely dependent on the economic and financial aspects of said firm; that economic sustainability should be taken into account alongside environmental and social sustainability and corporate governance (Dyllick and Hockerts, 2002).

To that end, it is established that in order to successfully avoid unforeseen financial problems, firms (especially those in the manufacturing sector) should pay particular attention to environmental and social sustainability. Attention is drawn to the case of British Petroleum's Deepwater Horizon oil rig disaster, where cost-cutting measures led to circumventing safety measures on an oil pipe, which eventually resulted in the eruption of between 3.2-4.9 million barrels⁵² of oil into the sea and the Gulf of Mexico in Florida in 2010 (Crooks, 2013b). The legal settlement costs which BP is likely to pay are estimated at US\$7.8 billion, whilst the US government officials and the Attorney General seek to impose a maximum penalty of US\$21 billion on the firm (Crooks, 2013d, Crooks, 2013b). On top of that, the number of BP's claimants and their respective claims seem to be increasing on a daily basis (Crooks, 2013c).

The extent of adverse financial and reputational consequences that BP has endured subsequent to the Deepwater Horizon explosion has highlighted the importance of business sustainability and the interdependent nature of its constituent parts. As such, it is crucial that firms in the same sector or those involved in manufacturing seek to avoid such disasters by, for example, following a rule-based system which firms would be able to follow on a continuing basis. This rules-based system is the topic of the final substantive Chapter of the current thesis. Two of the rules within said system, namely 3.2 and 3.3 are exactly based upon such principles: to clarify applicable law and to create a bespoke decision-making tool for complex situations, respectively (see Chapter 7 for further details and analysis).

One such complex situation is presented in the current Chapter, which concludes with the creation of a bespoke decision-making tool for classification of objects, materials or substances as waste/product/by-product, and thereby clarifying the applicable law in this regard. On the other hand it is well known (and somewhat expected as a commercial phenomenon) that waste management firms often seek to convince manufacturing firms that almost any object, material or substance whose legal status is unclear should be classified as waste. This behaviour is against the spirit of sustainability and the objectives of Directive 2008/98/EC in relation to encouraging efficient resource management through recycling and the introduction of the end of waste status. Therefore this Chapter provides a clear example of a situation where ineffective legal drafting has led to an unsustainable state of affairs in

⁵² BP argues that the spillage was at most 3.2 million barrels, whilst the estimate of the US government is as high as 4.9 million barrels (Crooks, 2013a). The author recognises that these figures may be controversial and as such does not claim that any of these figures are accurate.

relation to economic and environmental issues. This is also a testament to the extent of interrelationship between the three pillars of sustainability.

The research conducted in this Chapter was commissioned by Firm C, with the overarching objective of minimising the risk of environmental damage from their manufacturing activities pertaining to the creation of waste material (Schurmans, 2011).

It seems that *economic sustainability* attracts the least analysis and scholarly thought among academic and other types of literature compared to environmental and social sustainability pillars⁵³. Even though this Chapter focuses on economic sustainability, it is important to realise that none of the different aspects of sustainability should be viewed in isolation. To that end, economic sustainability does not drive the overall sustainability of a corporation alone (Gladwin et al., 1995). Short term success is not unheard of based on a single-minded focus on economic sustainability; however, all three dimensions of sustainability should be satisfied simultaneously for sustainability in the long run (Elkington, 1997, Crane and Matten, 2007, Dillard et al., 2008). The three dimensions are inter-related: for example in the current Chapter, a firm focuses on its economic sustainability, which is directly dependent on environmental sustainability – i.e. waste management; if not clarified by the work in this Chapter, the ambiguities within Directive 2008/98/EC would have led to an unsustainable rate of resource use by Firm C, since the firm would have assigned most of the objects, materials or substances as waste and would therefore discard them. This action would have been against the spirit of environmental and economic sustainability (in terms of resource depletion and operational inefficiencies within the firm).

In modern theory one of the implicit foundations of good corporate citizenship, especially in the realm of economic sustainability, is that the business activities of firms should enhance the economic and political framework in which they are embedded (Crane and Matten, 2007). A narrow vision of economic sustainability (perhaps somewhat a traditional view) would suggest that emphasis should be placed on the economic performance of the organisation itself, including ensuring a long-term rise in share prices, and increasing revenues and market share while using resources with the view on their long term viability (*Ibid*).

⁵³ Much to the disagreement of Dillard et al., who believe that social sustainability has received the least academic attention (Dillard et al., 2008).

The current academic school of thought suggests that former view of economic sustainability, namely that the concept should be viewed from a macro-economic perspective, is how this pillar of overall business sustainability should be interpreted (Schaltegger and Wagner, 2006, Figge and Hahn, 2004, Crane and Matten, 2007). The financial data of a firm is often produced in detail voluntarily or by virtue of legislation; what is important to sustainability-orientated stakeholders is the organisation's contribution to the sustainability of a larger economic system, which is reported to a lesser extent (GRI, 2011b).

Therefore the questions to ask pertaining economic sustainability should be on a national (or even international) scale and not restricted to the financial performance of the firm itself. One vastly important environmental issue which is closely tied to national interests and industrial activity is that of waste management (Hultman and Corvellec, 2012). The statistics provided by the European Commission attests to this claim: 19% in 2012 and 22% in 2011 of all environmental infringements were related to waste (Europa, 2013, Europa, 2012).

The link between the interests of policymakers and those of businesses is rather complex. On the one hand, the modern mass production, based on the demands of contemporary urban consumers has made waste an environmental problem in terms of its growing amounts and its increasingly complex nature – for example, hazardous materials hidden in products resurface with problematic consequences when the products reach the end of their commercial life interests (*Ibid*).

On the other hand, there is overwhelming argument for firms to be able to conduct business as much as possible with the objects, materials and substances which are made as a result of the production of their main products. The basis of these arguments is that ultimately and in a perfect competition market scenario, all objects, materials and substances will be of value to someone and that person or firm would be willing to purchase it – thus, theoretically, there is a demand for all objects, materials or substances (Kramer, 2011, Hultman and Corvellec, 2012).

By way of an example, tangible assets in a company's balance sheets have monetary values assigned, which depreciate according to a certain rate in time. However when an asset is completely depreciated it is not to say that the market value of that product is zero, but that the asset has been fully utilised in relation to the market value at which it was purchased.

That is to say that the same asset will have a monetary value in the free market, but that the company does not need to sell that asset in order to make a profit out of it. This will entail that the company could discard that asset and leave it on the street or abandon it on dumping sites, while an engineer could find that asset or components of it useful in another project. Thus, in terms of accounting, it is false to treat that asset strictly as a waste.

However, a large amount of such objects, materials and substances contain properties which are deemed hazardous to the environment and human health; alternatively, they do not contain hazardous materials but components of said objects can be used in the creation of further products instead of being fully discarded. The legislative body regulating waste management in the European Union strives to find the correct balance between these business needs and the need for the protection of the environment and human health (Directive 2008/98/EC).

However, that is not to say that EU policymakers and regulators have been able to accurately find the balance between these conflicting interests in the new European Waste Framework Directive. Over the years there has been growing concern about the clarity of legislation enacted by the European Union, particularly those affecting hard industries such as manufacturing. Directive 2008/98/EC is one such example (Feliziani, 2012, Eloneva et al., 2010).

One of the objectives of the new Waste Framework Directive (2008/98/EC) is to encourage a sustainable use of resources (natural resources, *inter alia*) and production residues; the former through the establishment of the waste hierarchy and the end of waste criteria, and the latter through the introduction of by-products (Pajunen et al., 2013). However, in doing so, the legal definitions of terms used within said legislation were somewhat ambiguous to the extent that firms, such as Firm C were unsure about the correct classifications of a number of objects, materials or substances.

With the correct application of this Directive, firms such as Firm C would be able to reuse some of the substances, which under the old regime would have been classified as waste and would, thus, be confined to landfill sites. Furthermore, classifying an object, material or substance as waste will necessitate either further processing (in order to reuse said object, substance or material) or being discarded as waste. In both instances, said object, material or

substance would be classified as *waste*, which entails that extra diligence is required during transportation or further processing; these extra precautions will lead to significantly increased overhead costs to said manufacturing firm (in this case, Firm C). This type of operational inefficiency, which is a direct result of unclear legislation, is against the spirit of corporate sustainability.

Another objective of this Directive was to address business needs in terms of greater clarity and flexibility for the classification of waste and products. The market required a new and clear classification for objects, material or substances which were not a manufacturer's intended product, but yet would qualify as a non-hazardous sale after minor modifications due to the existence of market demand (Eloneva et al., 2010, Apitz, 2010).

As such, the new classification of By-product was created in the new Directive in order to create legal clarity in relation to the definition of waste, encourage a sustainable use in production residues, and meet business needs in creating legal flexibility. Nevertheless, the new category created further confusion within the market due to lack of adequate legal clarification with regards to a number of key terms within Articles 3 and 5, where Waste and By-Products were defined (Scotford, 2008). Furthermore, the Directive fails to provide a definition of a *product* in order to clarify the natural boundaries between these classifications.

This Chapter clarifies the current regulatory position with regards to the legal definitions of Waste, Product and By-product through analysing case law, Commission reports, White Papers and academic scholarship. It has been written with the knowledge that it would be read by both lawyers and non-lawyers. The Chapter is useful in respect of its specific purpose, to know the "waste/non-waste" status of particular materials that form part of the activities of multinational corporations. As such, it is important also to provide a comparative analysis of Waste Management Law based on the law of the European Union and that of the United States of America pertaining to the distinction between "waste" and "(by) products".

The Chapter will then produce a framework for corporate decision-makers to correctly classify said objects, materials or substances correctly as waste, product or by-product. This is in the form of a standardised table, which will take the reader through a number of questions and will ultimately help in deriving a conclusion as to the legal status of an object,

material or substance. The reader is strongly advised to visit Appendix IV to view this framework.

5.1.1. Methodology

Relevant existing law in respect of the range of legal sub-issues have been explained. In addition, selected observations have been made in an industrial context. The methodology also enables for industrial operators to take example substances and analyse their waste status by reference to detailed tables that in part reflect the analysis in this Chapter (see Appendices II, III and IV). Thus, manufacturers will have clear worked examples for substances that are of specific interest. The remainder of the main evidence is structured as follows:

- There is an analysis of the definition of waste, holder and waste criteria;
- There is detailed analysis of the “waste” versus “by-products” distinction;
- The “Waste versus By-Product Decision Tree” is introduced;
- The “Waste” versus “Product” distinction is explained;
- “End of Waste” criteria are analysed; and
- A wrap up conclusion with relevant caveats is provided.

This Chapter has been written in light of the difficulties faced by manufacturers and other economic actors in the heavy industries, *inter alia*, when dealing with the new Waste Framework Directive (Directive 2008/98/EC). Thus, often reference will be made to ‘a manufacturer’ in order to provide pragmatic solutions to such issues.

5.2. Summary of the EU Waste Management Law Framework

In order to discuss the legal definition of waste it is important to understand the layout of the regulatory framework of the European Union surrounding waste management. Each Member State of the European Union is required to draft and regularly update waste management plans as an overall implementation strategy for waste management (European Commission, 2003). Several Directives focus on specific waste streams aiming mainly at the implementation of the waste hierarchy and producer responsibility, such as various legislations pertaining to waste oil, packaging and packaging waste, waste management and disposal methods, and so on.

Other Directives, such as the Incineration of Waste Directive⁵⁴ and the Landfill of Waste Directive⁵⁵ also address waste management operations. Different types of detailed permits are required for establishments conducting waste recovery, waste disposal (incineration and landfilling) and transport. For larger installations they are drawn from the Integrated Pollution Prevention and Control Directive⁵⁶, though the permitting of the non-IPPC installations in the waste sector is also recommended. It is worth noting the role of permitting in addressing guidance upon and management of “waste” and “products” as regulatory authorities have specific responsibilities (and even liabilities where there is regulatory negligence) to firms in that regard.

Records (an important feature of solid and hazardous waste management) should be retained by the establishments as well as by transporters of waste and hazardous waste which is regulated in detail, too, and both, waste disposal and waste recovery establishments are subject to appropriate inspections by competent authorities (European Commission, 2000). Through Decision 2000/532/EC⁵⁷, the EU established a detailed list of wastes and repealed the former European Waste Catalogue and Hazardous Waste List⁵⁸. This regularly amended list of wastes still distinguishes between hazardous and non-hazardous waste.

As well, Regulation 1013/2006 regulates in detail the supervision and control of shipments of waste within, into and out of the EU in accordance with self-sufficiency and proximity principles and in line with the Basel Convention requirements.

5.3. Definition of Waste

Directive 2008/98/EC (hereinafter “the Waste Framework Directive”, or “the Directive”) is currently in force and determines what materials fall under the scope of “waste”. It is

⁵⁴ Directive 2000/76/EC of The European Parliament And of The Council of 4 December 2000 on the incineration of waste

⁵⁵ Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste.

⁵⁶ Directive 2008/1/EC of The European Parliament And of The Council of 15 January 2008 concerning integrated pollution prevention and control.

⁵⁷ This is the latest version of the European Waste Catalogue.

⁵⁸ *Ibid*, Article 5.

important to know the scope of the Directive (and other key EU waste legislation) since it triggers obligations applicable to waste⁵⁹.

The 2008 Waste Framework Directive was preceded by the Waste Framework Directive (2006/12/EC) and the 1975 Directive on Waste (75/442/EEC). Directive 75/442/EEC was passed in order to protect human health and the environment from the harmful effects caused by the collection, transport, treatment storage and tipping of waste. In April 2006, Directive 2006/12/EC was passed in order to consolidate and clarify the several amendments that were made since 1975 to the original Directive⁶⁰.

The 1975 Directive defined waste as ‘any substance or object in the categories set out in *Annex I* which the holder discards or intends or is required to discard.’ The 2006 Directive maintained the same definition of waste as it was given in the 1975 Directive. The definition is consistent of two criteria, namely that a substance has to fit within one of the categories in Annex I, and secondly that the bearer of that substance must intend or be required to discard it. It is interesting to note that the final category, Q16 in Annex I of said Directive seems to have been added in order to include any new materials that have not been contemplated by the drafters of the Directive.

It is not untenable to assume that this definition could potentially be insufficient and not applicable to every eventuality; one’s ‘waste’ may well be useful to another, albeit if that product needs to undergo some change in order for being reused. Technically, every substance will have some monetary value somewhere in the world and every object that could be burnt will produce heat and thereby is a potential energy source (Kramer, 2011). In light of that the objectives of the 1975, 2006 and 2008 Directives include the encouragement of preservation of natural resources and the reuse of products. Nevertheless the choice of words in the definition of waste according to these Directives remains explicit. Such inadequacies in the legal definition create uncertainties among the businesses. Such ambiguities have led to disparities in the decisions of the European Court of Justice in recent years, resulting in a further “erosion of legislative clarity” (Nash, 2009).

⁵⁹ For example, trans-boundary movements of waste as defined in the Waste Framework Directive are subject to the strict procedural requirements of the EU Waste Shipment Regulation (EC) N° 1013/2006.

⁶⁰ Recital 1.

By way of exclusions, the definition is also crucial in that it clarifies which objects, materials or substances are not waste through not meeting the criteria set in the definition, or because the material meets the criteria of by-product. The Waste Framework Directive defines waste as “*any substance or object which the holder discards or intends or is required to discard.*” Thus the key terms required to define waste are “substance or object”, “waste holder”, and “discard”.

Under certain circumstances, materials recovered from waste can cease to be waste (see ‘end-of-waste’ criteria below). In that case, the obligations derived from Regulation 1907/2006 and Regulation 1272/2008 for the substance or mixture will need to be met⁶¹.

The large number of decisions with regards to the definition of waste shows the complexities involved in providing an exclusive definition of waste. The many stances that the European Court of Justice (ECJ)⁶² has taken over the years together with the court’s reluctance in setting a clear test for inclusion within the definition has resulted in a wide definition of waste, and have been unhelpful in achieving a less ambiguous legal position (Eloneva et al., 2010, Bell and McGillivray, 2008). Of course, to a large extent this is due to the inherent complexities associated with the individual characteristics of cases that the court is faced with, leading the court to make purposive interpretations of the successive Waste Framework Directives. Hence it is best to break down the different components of the definition of waste and explain them in detail. In doing so, it should be noted that the decisions of the European Court of Justice which are referenced below do not directly determine the national law of Member States, but only affect the organisations involved (i.e. parties to the case). Still, it would be wrong for Member States to ignore the said decisions when applying EU law in a national context.

5.3.1. Any Substance or Object

The terms “substance” and “object” are not to be understood in the sense of EU chemicals legislation, but as autonomous terms of waste legislation which are to be understood broadly, making clear that the concept of waste is not restricted to the shape of the object (European Commission, 2012).

⁶¹ For example, registration, Safety Data Sheet, update internal REACH SID database.

⁶² Officially the Court of Justice, post Lisbon Treaty (Treaty of Lisbon amending the treaty on European Union and the Treaty establishing the European Community, 2007).

It is noteworthy that the Waste Framework Directive no longer makes a link to *Annex I* categories of waste (which was non-limitative) as the previous Directive did (under the Directive “any” substance or “object” can be waste), but the definition of waste itself has not been modified compared to previous legislation. As such, the case law that has developed since 1975 can still provide industries with implicit guidance about whether an object, material or substance is a waste.

The European Waste Catalogue (EWC) classifies waste types and lists several different categories of waste. One of the examples of waste categories is “Off Specification Products”. It might be argued that objects, materials or substances which are placed in the EWC should be characterised as “waste”. However, since Article 3(1) of the Waste Framework Directive does not refer to the Catalogue when defining “waste”, the EWC will not play a significant role in the interpretation of the current waste law of the European Community.

In principle, it is worth noting that raw materials, secondary products, by-products and production residues are likely not waste unless there is an intention to discard them. Consumption residues (i.e., the residue that arises after the use of products such as scrap metal from machines or vehicles) generally are wastes and should be reviewed against the “end-of-waste” requirements of the Directive. In the *Antonio Niselli* (2004a) case⁶³ the court stated that “[the] concept of waste is not to be interpreted as excluding all production or consumption residues which can be or are reused in a cycle of production or consumption, either without prior treatment and without harm to the environment, or after undergoing prior treatment without”.

It is, therefore, stipulated that any substance can be a waste if discarded. The fact that an object or substance is listed on the European Waste Catalogue is not decisive in characterising an object, substance or material as waste.

5.3.2. The Holder

A “waste holder” is defined as either the producer of waste or the 'natural or legal person' who possesses it (Sub-Article 3(6) of the 2008 Waste Framework Directive). At a practical level, this definition allows both “waste producers” and “possessors” of waste to be legally

⁶³ 2004a. Criminal proceedings against Antonio Niselli. *ECR I-10853*. ECJ.

responsible for it. Thus, in that specific instance the manufacturer also becomes a waste producer and thereby possibly liable for the costs of waste management. Taking account of these points, when a manufacturer is demonstrated to be in a position of control over an object, substance or material as it becomes a waste then that manufacturer may well have responsibility for relevant waste management costs.

In respect of waste management costs and liabilities, as a general rule, the reasonable regulator will, in the first instance, look to the “holder” that caused the waste-related environmental damage⁶⁴ (in accordance with the polluter-pays principle⁶⁵). However, even then, any holder (including the waste producer) may in principle be liable for waste management responsibilities. Article 14 of the Waste Framework Directive is the relevant legislation in this regard. In summary, Article 14(1) provides that waste management costs shall be borne by the original waste producer or the previous or current waste holders and that a Member State has the discretion to hold producers (and distributors) fully or partially responsible for these costs. Article 14(2) specifically allows regulators to attribute some or all of the waste management costs to producers of products (i.e., manufacturers). According to Article 14(2) Distributors may also be required to provide for a share of these costs.

In practice, it is not likely that Member States will resort to charging product manufacturers for the waste management costs of their petrochemical products when the waste producer or holder is/are available to address such costs (in accordance with the polluter-pays principle). For example, where a manufacturer is the owner of a product which becomes a waste while in the possession of a third party (for example, a transporter or customer), the polluter-pays principle becomes relevant. This principle would dictate that the holder of the waste - who has also caused it to become a waste (through an act or omission) and is thus the waste producer - would be the likeliest party to take on the relevant waste management costs in the eyes of the regulator.

⁶⁴ This is so mainly because the term ‘holder’ has traditionally appeared in the European Waste Framework Directives as key to the definition of waste. In many judicial cases the court has begun by evaluating the circumstances of the holder and whether or not those circumstances have led to an object, material or substance becoming a waste.

⁶⁵ As enshrined in Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage.

The case of *Paul Van de Walle and Others v Texaco Belgium SA*. (2004c) involved a petrol filling station leased by Texaco and operated by a management company under a contract with Texaco. Hydrocarbons leaked from the underground tanks and led to the contamination of soil and groundwater. The ECJ decided that by its conduct, Texaco was the waste producer (and therefore the holder of the waste) since the leakage of the hydrocarbons from the storage tank was due to a fault on the part of Texaco. In this regard, it also looked at Texaco's contractual obligations under the filling station lease. As such, where a company is in position of control of an object, substance or material and there is disregard for a contractual condition or an act or omission that creates a waste management cost or liability, then that company can be found partially or fully liable.

The *Van de Walle* decision implies that where there is a breach of broad prohibition on the abandonment, dumping or uncontrolled disposal of waste whether intentional or not, the waste producer and/or holder of waste is/are legally responsible in terms of potential prosecution and related remediation costs.

In *Commune de Mesquer v. Total France* (2008b), the ECJ argued that in case of the accidental spillage of hydrocarbons by the shipwreck at sea causing pollution of the coastline of a Member State, the national court may regard the seller of those hydrocarbons (Total France) and the charterer of the ship carrying them as a producer of that waste, as "previous waste holders" insofar the seller or charterer contributed to the risk that the pollution caused by the shipwreck would occur, in particular if he failed to take measures to prevent such an incident, such as measures concerning the choice of ship.

In the same case, the ECJ also mentioned that if it happens that the costs of disposing the waste cannot be borne by the International Oil Pollution Compensation Fund, or cannot be borne because of a ceiling in compensation, and according to national law (limitations or exemptions) the costs cannot be borne by the ship owner and/or the charterer, the national law has a provision for that cost to be borne by the producer of the product from which the waste thus spread came. In accordance to "the polluter pays" principle, however, such a producer cannot be liable to bear that cost unless he has contributed by his conduct to the risk that the pollution caused by the shipwreck will occur.

Taking this all into account, this means that reference can be made to a product manufacturer, as a result of whose manufacturing activities waste may be produced. In that specific instance the manufacturer may also become a waste producer. Therefore, manufacturers should be aware that where their products become waste then they may be seen as a “waste holder” (as producer) and thus may be liable for the costs of waste management. Taking account of these points, when manufacturers are demonstrated to be in a position of control over an object, substance or material as it becomes a waste then they may well become responsible for relevant waste management costs.

In the context of off-specification products for example, as it is possible that more than one party may be a “holder” of waste, it is reasonable for the relevant firm to have arrangements with its customers or transporters such that said firm is notified by the customer or transporter as to when a product is off-specification. This is suggested because it will alert the customer or transporter not to “discard” the waste. This leaves firm with the opportunity to maintain the non-waste status of the product. Under such an arrangement, the customer or transporter that does not so notify the manufacturing firm is more likely to be left with the relevant waste management costs as it may well be deemed to accept that it has control over the product.

In summary, therefore, waste producers and possessors of waste both are potentially “waste holders”, and as such may be found liable for waste management costs when products become waste. Producers of products that are in a position of control over or are otherwise seen to have caused pollution from said product waste are potentially liable for all of the relevant consequences. Wastes in the possession of manufacturers are also their responsibility to manage in accordance with applicable legislation.

5.3.3. Discard

The overarching position with regards to the discard discussion is that if an object, material or substance is being discarded then it is “waste”. There are three alternatives:

- i. the holder discards (describing an action or activity of the holder);
- ii. the holder intends to discard (describes an intention of the holder); or
- iii. the holder is required to discard (there is a legal obligation).

According to the judgement in *Van de Walle* (2004c), discarding can be intentional/deliberate on the part of the holder or unintentional/ involuntary/accidental or, can even occur with or without the awareness of the holder. According to *Palin Granit Oy v. Vehmassalon kansanterveystyön kuntayhtymän hallitus* (2002) the location of storage of a material does not have an effect on whether it is a waste or not⁶⁶. This can be different for certain Member States. Though it is not consistent with the Directive, some Member States determine that when a material, object or substance is moved off-site then it becomes a waste. Other Member States do not make this location-based conclusion.

Therefore, it is clear that it is not enough for a manufacturer to simply say that objects, materials or substances have not been, or are not intended to be discarded. The surrounding factual circumstances will determine whether a regulator or court can construct the act or intention of discarding. This is why it is important to look at a criteria-based approach (provided below). It is also worth noting that a good-faith intention not to discard an object, material or substance may well constitute some evidence that it is not going to be discarded. However, according to *R (on the application of OSS Group Ltd) v. Environment Agency and others* (2007a), it must be noted that the concept of waste cannot, according to the trend in case law, be interpreted restrictively. The Court of Appeal emphasised the need to take a purposive approach to legal interpretation in such cases.

It is important to note that the ECJ has established that almost all processes of recovering waste material fall into the ambit of ‘discarding’. Thus, it is important to briefly examine the activities which are interpreted as “recovery”. For that, it is instructive first to look at Annex II of the 2008 Waste Directive, which identifies 13 types of recovery operations. Nonetheless, it is important to recognise that according to *ARCO Chemie Nederland Ltd v. Minister van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer* (2000a), the fact that a recovery operation listed in Annex II is being applied does not establish conclusively that a discard has taken place. For example, manufacturers may argue that if a recovery activity is a normal industrial processing activity then the object, material or substance is not a waste. To make this point clear, even though Annex II, “Recovery Operations” identifies item “R9 Oil re-refining and other reuses of oil” as a recovery operation, other reuses of unused oil on site

⁶⁶ Per paragraph 28/29.

(for example, as a raw material) may well mean that said oil is not a waste provided that its reuse is part of a normal industrial process.

Though “normal industrial practice” has no legal definition in EU waste law, it is worth noting that according to *Commune de Mesquer v. Total France SA* (2008b)⁶⁷ and the *Antonio Niselli* (2004a) case, an object, material or substance that is processed through a conventional waste treatment process will be seen as a waste⁶⁸ (i.e. a recycling process). Equally, it is easier to characterise an object, material or substance that has gone through a relatively simple process (for instance, the removal of water from toluene) as a non-waste when compared to a multi-step complex process akin to recycling (European Commission, 2007).

It is important to note the court in many cases has ruled that discarding does not have to be intentional (*Saetti and Frediani* (2004b), *Van de Walle* (2004c) and *Thames Water Utilities v. South East London Division* (2007b)); it can also occur as a result of an accident, such as fuel spillage or waste water leakage. Therefore accidental spillages probably cannot be characterised as normal industrial operations.

Apart from the factual scenarios surrounding actual discarding, it is also worth noting that a simple legal requirement (on national or Community levels) to treat an object, material or substance as a waste will render the substance as a waste (Article 3(1) of 2008/98/EC refers to the requirement to discard).

Whether a substance is likely to be classified as waste will depend, to a considerable extent, on the behaviour of the holder of that substance (of course, unless there is a legal requirement to discard). The characteristic of the substance cannot by itself determine whether or not it is a waste. In *Palin Granit* (2002) left over stones were considered to be waste since immediate use was deemed unlikely, whereas in *AvestaPolarit* (2003a) the leftover rocks were deemed not to be waste since firstly, the immediate use was certain (in the same production process) and second, that reutilisation would have been economically advantageous to the holder. In both cases the composition of the leftover materials was the same as the primary product, but in the latter case, a possibility of future use had already been established. On this point, where

⁶⁷ Per paragraph 23

⁶⁸ Per paragraph 39.

objects, materials or substances can be seen or characterised by manufacturers as raw materials or feedstock for normal industrial processes, then this is evidence that they are not intended as waste. A change in intended use does not by itself negate this claim. However, long term storage provides evidence that there is no intended use at all.

It is noteworthy that the ECJ has also stated that the definition of waste is not to be understood as automatically excluding substances and objects which are capable of economic reutilisation; it does not presume that the holder disposing of a substance or an object intends to exclude all economic reutilisation of the substance or object by others (per *Zanetti* (1988) and *Tombesi* (1997b)). Technically, every substance will have some monetary value somewhere in the world and every object that could be burnt will produce heat and thereby is a potential energy source. However, if the Waste Framework Directive were to exclude all substances which have economic value for the holder from being “waste”, then the objectives of the 1975, 2006 and 2008 Directives would have been significantly undermined. One of the aims and objectives of the Waste Framework Directive is to control the recovery as well as disposal operations in order to protect the environment and human health from potential adverse effects of otherwise uncontrolled waste management activities.

On the matter of ‘economic value’, where an object, material or substance has value beyond its value as a waste or as an avoided waste management cost then this can provide evidence that it is not being discarded. In respect of “product value”, market and spot market values should be treated relatively indistinguishably as spot markets do not - by and large - exist to tell sellers that their products are worthless. They merely give buyers and sellers the opportunity to agree product prices in varying conditions and at varying times. The fact that products are sold using spot markets is an indicator of their contracted value. Such value is an indicator that such products have a certain use and are thus not waste. Ideally, it has a product value or brings value as a by-product (for example a raw material, feedstock or a secondary product that can be sold as such).

Such a line of argument may well be persuasive in avoiding the characterisation of an object, material or substance as a waste. This argument would be made stronger still if it can be demonstrated that said “non-waste” status achieves another objective of the Directive, namely the encouragement of preservation of natural resources and the reuse of products.

It is clear from the above that factual circumstances play an important role in determining whether an object, material or substance has been discarded. As such, the following considerations have been drawn from case law, legal reasoning and best practice in order to determine whether if the legal act of discarding has taken place. A positive response for these questions provides evidence that the object, material or substance is being discarded and thus is a waste:

1. Will the material be next used in a disposal or recovery operation by anyone (*ARCO Chemie*)?
2. Does it have hazardous properties beyond its properties as a product? (*ARCO Chemie* and *Palin Granit*)?
3. Has the substance already been addressed as a waste by industry practice or by regulation or legal order (*ARCO Chemie* and *Spanish Manure*)?
4. Is it a discarded secondary raw material (for example scrap) (*Mayer Parry* (2003b) and *Niselli*)?
5. Is there indefinite storage of the material (*Palin Granit*)?
6. Does the substance contain contaminants that are beyond those found in it when the substance forms part of its intended product (*Commune de Mesquer* and *Van de Walle*)?
7. Has the substance been consigned to an operation conventionally regarded as recycling, recovery (for example, discard of solvents for regeneration) or disposal (for example, spreading of material on land for a beneficial purpose is not disposal) (*Euro Tombesi* and *ARCO Chemie*)?
8. Is the substance being recovered rather than undergoing an ordinary industrial use such as grinding or crushing⁶⁹ (European Commission, 2007)?

Whilst, irrelevant factors for determining if discarding has occurred include:

1. How and where the substance was stored;
2. Its composition;
3. Whether it posed any real risk to human health or the environment.

⁶⁹ Note that the 2008 Waste Framework Directive Annex II, a recovery operation may also be an ordinary use and hence a “waste” conclusion is not automatically reached.

5.4.3.2. Practical examples from the above mentioned criteria

To give selected examples of whether discarding has taken place the following must be considered:

- Gasoline and diesel that are by error mixed or spilled are to be treated as discarded and are generally wastes⁷⁰ unless they will be used as fuel for another purpose (i.e., marine fuel) without further processing other than normal industrial processing;
- Petrochemical products that are contaminated with water or detergents are to be treated as discarded and are wastes unless a normal industrial practice can be used to remove the contamination and the other elements of the by-product definition can be met;
- A feedstock, raw material or residue (i.e. off specification lubricants) with an uncertain market or which will be stored for a considerable time without an intended use shall be treated as discarded and is therefore a waste;
- Used oils that may be put to a beneficial purpose (as feedstocks for biofuels) are nevertheless wastes because they are legally required to be treated as discarded (Article 21 of the Waste Directive).

The definition of waste does not automatically exclude objects, materials or substances which are deemed to have an economic value.

In summary, the crucial test for a waste classification is the ‘discard test’. Accordingly, once it is determined that a substance has been discarded by its holder, then that substance will be classified as a waste. The discard test largely depends upon the actions of the holder, though a regulator or court has the ultimate power to decide. Thus, the holder must seek to sell or reuse the substance in question with minimal reprocessing (as a general rule) as part of a normal industrial practice.

⁷⁰ Accidental spillages of products that pollute soil or water are to be treated as discarded and are therefore wastes (*Van de Walle* decision). The Court held that such hydrocarbons, although not inherently waste while contained on board the shipping vessel, once spilled at sea and mixed with water and sediment did constitute waste on the basis that they were to be regarded as substances which were not intended to be produced and which were, albeit involuntarily, ‘discarded’ since they were no longer capable of being exploited or marketed without prior processing.

5.3.4. Waste Criteria

Even though it is advantageous for manufacturers (or otherwise *waste holders*) to deny that a discard has taken place leading to a simple finding that the object, material or substance is not a “waste”, the European Commission may seek to enquire about further ‘waste criteria’.

It is learnt from *Euro Tombesi* (1997b) that when objects, materials or substances are consigned to a recovery procedure they are likely to be categorised as waste. However as discussed above, this is not necessarily the case and depends on the factual circumstances. In *ARCO Chemie* (2000a) a procedure which would technically have been a recovery process, was also deemed to be normal industrial practice. In this case, a by-product of a manufacturing process was recovered as a fuel in an environmentally responsible manner without substantial treatment and was thus found not to constitute a waste.

In *Palin Granit* (2002) the future use of leftover stones was unclear which led to the eventual ruling of the ECJ that they amounted to waste. A similar argument would apply to objects, materials or substances that are at a manufacturing site where their future use is not completely “certain” (the court has emphasised the requirement of certainty of future use and it is also enshrined in sub Article 5(1)(a) of the 2008 Waste Directive).

It would also appear to be the case that a customer receiving off-specification products, who would otherwise discard them (if a return of the products to the manufacturer were not possible), may have effectively changed its categorisation from a product to a waste. However, if a return to the manufacturer is possible⁷¹ and the product can be re-introduced as a raw material or feedstock to a normal industrial process for producing products or by-products then it is possible not to treat it as “discarded”⁷².

As such, not posing a threat to human health or the environment are not, on their own, to be sufficient for avoiding a ‘waste’ classification; though having certainty as to future use constitutes strong evidence that such objects, materials or substances are not intended to be

⁷¹ Though the Directive has no such requirement, some Member States consider objects, materials or substances that are not treated on one site to be wastes.

⁷² The definition of waste extends beyond the “discard test”. After analysing the Directives together with the Commission Communication on waste and by-products (2007) and the many conflicting decisions of the ECJ, 15 factors have been identified in a table in Appendix IV, which will help industrial actors decide whether an object, substance or material should be classified as waste.

wastes. The same applies where objects, materials or substances are used as raw materials or feedstocks as part of a normal industrial practice.

Broadly, it is suggested that the ECJ has stressed three themes in end of waste decision making; these are firstly, that the definition of waste must be interpreted widely, since a high level of environmental protection is the leading objective of EC environmental policy; second, that materials and processes which are involved in industrial practices are widely varied and as such, waste/non-waste decisions should be taken by the competent authority on a case-by-case basis, focusing on the factual circumstances; and last that even if objects, materials or substances satisfy the criteria created by ECJ case law and would therefore not be considered waste, factual circumstances could change this presumption (Eloneva et al., 2010). These will be explained in further detail below.

5.4. By-products

As it is clear from the case law, the status of residues of a production process has been subject to controversy and debate. As such, according to Kramer, residues are left over when cutting steel and gold, while in both cases the residues are melted and reused in new projects, particularly when dealing with gold (2011). However when chemicals are processed in order to create new chemical preparations, one of these cannot be considered as the residue of the other; in such cases they are both considered as products (*Ibid*).

The legislative position prior to the 2008 Waste Framework Directive was similar to that of the US, where objects, materials or substances were either “products” or “waste” with no direct consideration of “by-products”. The European Commission conducted a Communication in February 2007 on the interpretation of the then New Waste Framework Directive, Directive 2006/12/EC. In 2007 the overriding legislative position, as also confirmed by the tone of the 2006 Directive, was that substances were either products or waste, with no flexibility shown towards by-products. Thus, any ancillary substances produced as a result of the main manufacturing process would have been either a by-product or residues, in which case the former (by-products) would legally be called a product and the latter (residues) called waste (European Commission, 2007). In the United States, according to the Resource Conservation and Recovery Act of the United States (RCRA), objects or materials are categorised into wastes and non-wastes, where the waste category is divided

into two principal classes, namely Solid Wastes and Hazardous Wastes (the latter being a subset of the former category).

The difficulties arising through the classification of residues has been addressed in Article 5 of the 2008 Waste Framework Directive by creating a four part cumulative test for “by-products” in Article 5(1).

According to Article 5(1), “A substance or object, resulting from a production process, the primary aim of which is not the production of that item, may be regarded as not being waste [...] but as being a by-product only if the following conditions are met:

- (a) further use of the substance or object is certain;
- (b) the substance or object can be used directly without any further processing other than normal industrial practice;
- (c) the substance or object is produced as an integral part of a production process; and
- (d) further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.”

There is ambiguity in the legal meaning of terms such as “further processing” or “normal industrial practice” in the sense that they have not been conclusively defined in the 2008 Directive; nor have they been the subject of authoritative judicial interpretation that clarifies their meaning and scope. This is the reason why the European Parliament opposed the creation of a new category called by-products (see the Draft European Parliament Legislative Resolution of 18 April 2008 in reference to then Article 4 – now Article 5 of the 2008 Waste Directive (European Parliament, 2008)). The European Parliament also objected to what it perceived as an attempt to reclassify wastes as products. Given that this European Parliament opposition was effectively ignored and that the 2008 Waste Directive sought to encourage preservation of natural resources and the reuse of products it is right to conclude that the addition of the by-products definition probably extends the opportunity to characterise substances as non-wastes.

As the meaning of some of the terms in sub Article 5(1) is subjective, they are discussed further in this section. Here, the objects, materials or substances that result from a production

process that is not primarily aimed at their production are discussed. This requirement follows the ruling in *Palin Granit* (2002) that a residue of production can be an object, material or substance that results from a production process but is not in itself a production outcome. As such, this production residue can be a by-product.

It is thought that ultimately the exact scope of these terms remains to be determined by the Courts. Nonetheless the meanings of each of the subsections of Article 5 will be discussed in order to attempt to clarify the relevant legal trends thus far.

5.4.1. Further Use is “Certain”

The judgements of the ECJ have varied when considering further re-use of materials. This could, of course, be due to the changing nature of the European Waste Framework, where for example, the 2006 Directive added significant changes to its predecessor by introducing a waste hierarchy system along with measures to encourage waste recovery.

To that end, in *ARCO Chemie* (2000a), the ECJ ruled that the fact that a substance is made ready for re-use through an environmentally responsible manner is irrelevant in deciding whether it is waste.

In *Palin Granit* (2002), where stones were left over after a quarrying operation, it was ruled that the stones constituted waste even though they posed no danger to human health or the environment. The underlying reason for this decision was that the stones had been abandoned while the responsible entity was in search of a project where the stones would have been used in the future. But since that project was not imminent, the further use of the stones was deemed unclear. Nevertheless the Court maintained that:

“[In] addition to the criterion of whether a substance constitutes a production residue, a second relevant criterion for determining whether or not that substance is waste for the purposes of Directive 75/442 is the degree of likelihood that that substance will be reused, without any further processing prior to its reuse. If, in addition to the mere possibility of reusing the substance, there is also a financial advantage to the holder in so doing, the likelihood of reuse is high. In such circumstances, the substance in question must no longer be regarded as a burden which its holder seeks to ‘discard’, but as a genuine product.” (*Palin Granit* (2002), Para. 37)

Ultimately, the Finnish Government argued that “the only foreseeable reuses of leftover stone in its existing state, for example in embankment work or in the construction of harbours and breakwaters, necessitate, in most cases, potentially long-term storage operations which constitute a burden to the holder and are also potentially the cause of precisely the environmental pollution which Directive 75/442 seeks to reduce” (*Ibid*, Para. 38). Therefore, reuse was not certain and was only foreseeable in the longer term, with the result that the leftover stone can only be regarded as extraction residue which its holder ‘intended or was required to discard’ within the meaning of Directive 75/442, and thus fell within the scope of Q 11 of Annex I to that directive. It was held that where the future use of stones resulting from a quarrying operation was uncertain then they were waste.

Naturally, the opposite position holds that where a future use is certain then this part of the by-product test is easily satisfied, as was the case in *AvestaPolarit* in 2004. In *AvestaPolarit* even though the facts were similar to those in *Palin Granit*, the outcome of the case was different. In this case the substances in question were leftovers of rock and ore-dressing sand, which resulted from a mining operation. The holder of the substances claimed that the ore-dressings were needed in their current form for supporting mine galleries, and leftover rock also for landscaping the mine after it has ceased operation. It was also argued that minerals may in future, with the development of technology, be recovered from ore-dressing sand for utilisation. The Court made the following distinction between *AvestaPolarit* and *Palin Granit*:

“In this respect, a distinction must be drawn between residues which are used without first being processed in the production process for the necessary filling in of the underground galleries, on the one hand, and other residues, on the other.

The former are being used in that case as a material in the industrial mining process proper and cannot be regarded as substances which the holder discards or intends to discard, since, on the contrary, he needs them for his principal activity.

Only if such use of those residues were prohibited, in particular for reasons of safety or protection of the environment, and the galleries had to be sealed and supported by some other process, would it have to be considered that the holder is obliged to discard those residues and that they constitute waste.” (Para. 36-38)

Following judicial reasoning, therefore, a manufacturer will wish to demonstrate that any object, material or substance that is produced (but is not the product in itself) will be required for another purpose. Otherwise, following the reasoning of the ECJ, as holders of an unwanted substance that manufacturer may be seen as holding a discardable “waste”⁷³.

Interestingly, *Palin Granit* also held that where there is a financial advantage out of the reuse of an object, material or substance then this is evidence that it is not a waste. Hence, manufacturers should be prepared to make this point and should account for a financial value beyond the mere avoided waste management cost.

In *Antonio Niselli* (2004a) the court reaffirmed the position that the definition of waste as provided in the Directive does not automatically exclude residues capable of reuse in a cycle of production or consumption, either with or without prior treatment and with no harm to the environment, or after undergoing treatment. Importantly, this decision was taken before the creation of the 2008 Waste Directive. The 2008 Directive does not contemplate residues capable of reuse save for their consideration as by-products. As such, the test for such residues has changed to the Article 5 by-products exception and should be implemented accordingly.

In *Saetti* (2004b), the ECJ ruled that where a substance is created which is ancillary to the main product, which could be utilised for the same purpose as the main product with no more of an adverse environmental impact than the main product, then that substance would not be categorised as a waste. This would remain true even where the substance will be used in another industry or otherwise sold on to a third party for that use. If the substance was created as a result of a technical choice it would be taken as evidence for its imminent reuse.

By way of an example, one should consider the following scenario. A manufacturer has produced an object, material or substance (P_B) which is ancillary to the main product (P_A) of said manufacturing process. The manufacturer is aware of the production P_B during the normal production process of P_A , but continues to produce P_A using the normal

⁷³ In this regard, as existing product lines are replaced by new product lines it is still important that existing product lines are sold as such and their market value is thus recognised. Existing product lines will have a value unless the market indicates that they are worthless as products. Consider the analogy of television sets. As LCD TVs are technologically overtaken by LED TVs, this does not mean that the LCD TVs on retail shelves have become waste. They merely have a diminished market value.

manufacturing process. The manufacturer continues to do so due to their belief that there is market demand for P_B . The very fact that the manufacturer has made a conscious choice to continue producing P_B can be taken as an unequivocal intention to produce it. Moreover, it is also a valid assumption that the manufacturer has continued with the present production process for P_A involving the creation of P_B , since a market has been discovered for P_B , where a demand exists for it either in its current form or after minimal processing.

In summary, a “technical choice” can be made or inferred where a manufacturer knows that a substance has been produced and does nothing to alter the production of that substance. In effect, by a conscious omission it is making a technical choice to produce that substance. As such, this argumentation supports the position that P_B is a by-product.

In *EU Commission v Spain (Spanish Manure)* (2005), the ECJ in a ruling consistent with *Saetti* stated that it is possible for a substance to be regarded as a non-waste if it is certain to be used to meet the needs of economic operators, other than those which produced the substance. As such, if a utility can be envisaged for an off-specification product then this satisfies the “certainty of use” test so long as they meet any required industry specification for the said use. The court followed the same line of analysis when it came to heavy fuel oils in *Commune de Mesquer v Total France* (2008b). Accordingly, it was decided that heavy oil fuels do not constitute waste when they are sold as combustible fuel, are marketed on economically advantageous terms and are capable of being used as fuel without any further processing. This ruling may well apply to off-specification products where they were originally intended to be used as fuels.

Thus, in summary, the holder has to prove that the substances in question will be re-used within a reasonable period of time (for example, at most, months not years). In doing so, three characteristics may be used as evidence to that effect; these include:

- i. further use being clear from the outset;
- ii. said usage will be for the same purpose as the main product or another specified purpose is known; and
- iii. usage has economically advantageous terms for the producer beyond the avoided waste management cost for the object material or substance.

5.4.2. “Processing” and “Normal” Industrial Practice

The question that arises here is as follows: Are there any circumstances where “further processing” does not form part of “normal industrial practice”? To that end, large market players in heavy industries possess technical expertise about the nature of “normal industrial practices” pertaining to the substances and materials that they handle in the relevant sectors. Thus they are in a strong position to demonstrate whether further processing constitutes normal industrial practice. Therefore, the more market share an entity enjoys, the more influence they have on what practices are seen as “normal industrial practice” among other the industry/market players. This is an extension of the same analogy as that used in economic theory pertaining to market price-makers and price-takers.

It is also noteworthy that “further processing” could include both simple and relatively complex activities so long as they are not solely related to waste management. Waste management processes typically address hazardous properties that have arisen in an object, material or substance *beyond normal industrial practice* that need to be controlled due to their potential for environmental or human harm. Contamination of a product or production residue with hazardous material that is not part of the production process is an example.

In a recent request for preliminary ruling in *Lapin elinkeino-, liikenne- ja ympäristökeskuksen liikenne ja infrastruktuuri –vastuualue v Lapin luonnonsuojelupiiri ry* (2013a), a Finnish court (Korkein hallinto-oikeus) asked for clarification of the requirements of Directive 2008/98/EC, as to whether the use of old and decommissioned telephone poles treated with CCA (copper-chrome-arsenic) solutions for underlay for hiking trails. In doing so, the court, *inter alia*, asked the following questions:

1. Is it possible to deduce directly from the fact that waste is classified as hazardous waste that the use of such a substance or object has overall adverse environmental or human health impacts within the meaning of Article 6(1), first subparagraph, point (d), of the Waste Directive? May hazardous waste also cease to be waste if it fulfils the requirements laid down in Article 6(1) of the Waste Directive?
2. In interpreting the concept of waste and, in particular, assessing the obligation to dispose of a substance or an object, is it relevant that the re-use of the object which is the subject of the assessment is authorised under certain conditions by Annex XVII as

referred to in Article 67 of the REACH Regulation. If that is the case, what weight is to be given to that fact?

The court ruled that, as a matter of principal, EU law does not exclude the possibility that waste regarded as hazardous may cease to be waste, upon a recovery operation which enables it to be made used without endangering human health and without harming the environment. However, for said hazardous waste to be excluded from the waste classification, the holder of the object at issue must not have discarded it, intended or been required to discard it. Determining whether discard has occurred falls back to the court in question to ascertain.

A further issue at hand was the legal requirement of objects in question to be discarded within the REACH Regulation⁷⁴. The ECJ stated that this is a question to be addressed by the referring court, where it has to be determined whether such a possibility remains within the normal use of these objects.

Furthermore, manufacturers do not have to be engaged in normal industrial practice if there is evidence in the relevant sectors that a particular processing is often undertaken by third parties and/or off site. Third party expert firms that regenerate spent catalysts or provide toll blending services are examples of firms that play an integral role in industrial processes and their third party status does not adversely affect the “non-waste” status of the materials and substances that are part of multi-party normal industrial practices.

So when is this “further processing other than normal industrial practice” test not met? There is no case law to date that limits the application of this test to objects, materials and substances that might be characterised as by-products as part of normal industrial practices.

In *Commune de Mesquer v. Total France* (2008b), spilled oil and contaminated soil were found to be waste on the basis that they required prior processing before use. In *ARCO Chemie* (2000a), the same requirement was articulated as it was in *Palin Granit* (2002). However, this case law-based restriction on the non-waste status of objects, materials and

⁷⁴ Annex XVII provides that wood treated with a ‘CCA’ (copper-chromium-arsenic) solution must not be used in any application where there is a risk of repeated skin contact).

substances pre-dates the exception found in sub Article 5(1)(b) which allows further processing provided that it is part of normal industrial practice.

As an illustration of an expansive interpretation of normal industrial practice, in addition to the production process itself, cutting and packaging of blast furnace slag (a by-product of iron and steel production) is also accepted as constituting part of normal industrial practice (European Commission, 2007).

Further guidance is provided by reference to the following list of processing activities that can be considered to be part of “normal industrial practice” as long as they occur as an integral part of a production process: washing; drying; refining; homogenising; adding materials necessary for further use; and, modifying characteristics for further use.

Therefore, in summary, the correct interpretation of sub Article 5(1)(b) is likely⁷⁵ that:

1. Further processing is only acceptable if it is necessary to turn the existing substance into a marketable form.
2. So long as there is evidence of existing norms in the industry for dealing with a contamination, spillage, a recovery operation or any type of “(further) processing” then the requirements of this sub Article will be met.
3. It is important to demonstrate that said further processing (as part of normal industrial practice) is lawful and does not materially increase environmental or human health impacts [Art 5(1)(d)] (*Niselli*).
4. Sometimes certain activities are potentially processing activities or waste management activities (for example, recovery operations). It is important that where by-products are concerned, manufacturers can demonstrate that the object, material or substance is being used as a by-product (rather than being discarded as a waste) by reference to normal industrial practice.

⁷⁵ The term “likely” is used because some regulators are looking to have “regulatory position statements” in place as a means of securing a definitive legal position for a given object, substance or material.

5.4.3. “Integral Part” of Production Process

In order to tackle this requirement, sub Article 5(1)(c) will need to be examined on whether an object, material or substance will be produced as an “integral part” of a production process. In *Saetti* (2004b) the ECJ ruled that where a substance was the result of a technical choice then that substance would not be seen as a production residue and therefore would not be a waste. The substance in question was petroleum coke (a carbon-based material created in crude oil refining). The petroleum coke was produced as a result of a technical choice to use it as a fuel. Further to *Saetti*, other possible but not mandatory evidence that the production of the material concerned was a technical choice could include a modification of the production process in order to give the material concerned specific technical characteristics.

It was also found that if the coke would be used mainly for the same purpose as other substances produced in the refining process then it could be considered to be a manufactured product. Further to this point, according to the Commission Communication on waste and by-products, “if the manufacturer could have produced the primary product without producing the material concerned but chose to do so, then this is evidence that the material concerned is not a production residue” (2007).

It is also worth noting that an object, material or substance that is known by the manufacturer to be present in a production process, which the manufacturer does not eliminate prior to the production process, may be seen as an integral part/residue/by-product of that process, provided that it is otherwise compliant with the terms of the 2008 Waste Directive. Substances that amass and amalgamate on machinery/pipe work during the production and which need to be removed at various intervals could be presented as an example (see the example in section 5.4.1. above, on products P_A and P_B).

On the other hand, where accidents occur after production and a substance (or combination of substances) is created as a result of such an accident (for example, diesel and petrol are mixed together off-site), it is difficult to characterise it as a by-product because the new substance was not an integral part of the initial production process. However, as long as this combination of substances can be put to another use soon after the accident (and before the possibility of causing harm to human health or the environment) then it may avoid the “discard” requirement.

As such, it is stipulated that an active decision to continue producing a secondary substance is strong evidence that its production was an integral part of the production process. A new substance (or substances) that is/are created as a result of an accident is/are not integral to the original production process so therefore the “by-product” definition cannot be satisfied. However, as long as the substance(s) is not “discarded” (according to the legal definition) then a “waste” characterisation can be avoided.

5.4.4. Further Use is “Legal”

Further to sub Article 5(1)(d) this does not mean “legal” according to all legislation: the legal requirement applies only with regard to relevant legislation pertaining to standard-specific products and adverse impacts on human health or the environment only as concerns the specific use of the by-product.

In this regard, satisfaction of the Article 5(1)(a) “certainty of use” requirement will be an important one as any uncertainty as to use-related standards and impacts could give rise to an equivalent uncertainty about product use and environmental and human health protection legal compliance. On the other hand, establishing certainty in relation to use will narrow the applicable legal requirements and impacts accordingly.

5.4.5. Waste v By-Product Decision Tree

Two decision tree flow charts are shown in Appendices II and III in order to assist in determining the “waste” versus “by-product” categorisation.

In respect of the cumulative four-part test in Article 5 of the Waste Framework Directive, for practical reasons it is most appropriate to start with the fourth test concerning compliance of the intended use with applicable law. This is because the intended use is either legal or not. If it is not, then there is no reason for progressing to the other three tests. As such, this decision tree differs from that produced in the Commission Communication on By-Products to the extent that the order of the questions is different (European Commission, 2007).

5.5. Products

It is also possible that an object, material or substance may be seen as a product rather than a waste or a by-product. There is little in the way of specific legal or regulatory analysis of the

potential waste status of petrochemical industry products beyond what has already been discussed above. Therefore, there is a need to look at a definition for ‘product’ that contains product characteristics and then, finally, the product related legal criteria.

The Oxford Dictionary defines the term ‘product’ broadly as “a substance produced during a natural, chemical, or manufacturing process” (Stevenson, 2011). It is thought that the production of a specific product (or a number of specific products) is the primary objective of the existence of a firm. The more advanced and sophisticated the product is the more technical decisions need to be taken in order to manufacture it. If all goes to plan, the final product is generally produced with the intention to market it and make a profit out of its sale. Thus the holder or producer of the product does not intend to discard it, nor will they discard it. In the vast majority of cases a holder or producer is not legally obliged to discard that product. Thus, since manufacturers attach a market value to their products, this is evidence of their intention not to discard them. European Union law is consistent with these ideas.

A production process may well consist of several stages of production. At each stage, it may be the case that a different substance or object is created. Each substance created from individual stages of the production process may have different demands in the market. However, it is likely to be the case that the final product, the substance for which the whole of the production process has been set up, has the most added value created by the manufacturer. For an illustrative example, in a cement manufacturing plant firstly, a mixture of the grinded rocks and minerals is produced. Whilst this mixture is indeed marketable, they are not in high demand since the technology for their production is comparatively common. These are then processed in mills and are cooled in order to produce clinker. Clinker is a specialised product and faces a much higher rate of demand compared to the initial amalgamated rocks and ores. Therefore, clinker can also be seen as *a product* of a cement plant, even though it can be further processed in order to produce a product which is of a much higher market value. As such, clinker is processed in cement kilns in order to produce cement, which is usually the final product of a cement plant. The demand for the powder-like cement is highest amongst the other two *products* since it has the highest value added.

However, that is not to say the rest of the products are waste, or merely raw materials for the next step in the whole of the manufacturing process. None of the other substances, objects or materials, which are produced as ancillary products to cement are to be treated as waste since

they are used as raw material or feedstock for the next stage of production. They are an integral part of production, even though they are not the final objective of the manufacturing plant.

When applied to the matter at hand, in *Saetti* (2004b), the Court commented that even if petroleum coke had automatically resulted from the refined process it would still be regarded as a petroleum product and not a waste residue if it is certain to be used mainly for the same purposes as the other substances produced in the refinery. The Court also noted that when the material concerned was a result of a “technical choice” it could not be a production residue (i.e. a waste).

The common characteristics of products are: 1) Produced intentionally with the aim to be presented into a market; 2) Planned and a clear production/assembly line will have been engineered; 3) Of clear future utility; 4) Sold in a manner that is economically advantageous to the holder of the product and their sale is not a mere reduction of loss. Of course, this is not an exhaustive list of elements and is not aimed at producing a legal definition for “products”. Such a definition cannot be found in one place. Therefore, the case law is a useful end point.

Evidence that an object, material or substance is a product rather than a waste includes:

1. Whether the use of the material in the future is certain and not a mere possibility (per *Palin Granit* and *Saetti*);
2. Whether the use or sale of the substance is economically advantageous to the holder/producer (per *Palin Granit* and *AvestaPolarit*) – even though the mere fact that the substance has economic value is not a sole determinant that it is not a waste (per *Tombesi* and *Zanetti*);
3. Whether the production of that substance has been part of a continuing process of production in which case it is a non-waste (either as a product or production residue) (*Spanish Manure Case*);
4. Whether a technical choice was made to create the product (*Saetti*).

The most important characteristic of a product, which distinguishes it from a waste, is that it has been produced intentionally with a financial benefit in mind.

5.6. End of Waste

The concept was introduced in 2005 by the Thematic strategy on the prevention and recycling of waste, and was adopted as part of Directive 2008/98/EC (European Commission, 2005). It has been argued that the introduction of the end of waste criteria together with by-products are the two most important reformed aspects of the new Waste Framework Directive (Eloneva et al., 2010).

The new Directive introduced the concept of End of Waste into the realm of legislation, such that certain waste streams having undergone a recovery operation and fulfilling certain criteria can cease to be waste. The objective of defining End of Waste criteria was to clarify the definition of waste, since there had been repeated reports of market confusion in several material streams traded in the EU (Villanueva et al., 2010). Such attempts at clarifying the definition of waste helps in the creation of transparent market conditions and promotes recycling and reducing the consumption of natural resources and ultimately the amount of waste sent for disposal (*Ibid*). In the circumstances where an object, material or substance is found to be a waste, there are important commercial reasons why it is essential to determine when it will no longer be considered a waste. When an object, material or substance is no longer a waste then relevant waste notification, reporting, permit, shipment and other management regulations no longer apply. Hence a discussion of the “end of waste” provisions of Article 6 of the 2008 Directive is required.

According to Article 6 of the 2008 Waste Framework Directive, certain wastes shall cease to be waste when they have undergone a recovery operation (including recycling) in accordance with the following conditions:

- (a) The substance or object is commonly used for specific purposes;
- (b) A market or demand exists for such a substance or object;
- (c) The substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and,
- (d) The use of the substance or object will not lead to overall adverse environmental or human health impacts.

Furthermore according to Article 6(1), specific criteria that regulators should use in satisfying this provision are to include limit values for pollutants where necessary, and shall take

account of any possible adverse environmental effects of the relevant substance or object. In this regard, end of waste criteria must be designed by regulators with a high level of environmental protection in mind (Recital 22 of the 2008 Directive).

The first two above-mentioned criteria ((a) and (b)) are relatively easily satisfied by reference to a trading arrangement as between a supplier and user of the object, material or substance. Evidence of a market price for the object, material or substance and/or the existence of standards or specifications for trading purposes will also likely satisfy these tests. In respect of criterion (c), compliance of the object, substance or material with such standards or specifications, as applicable to comparable virgin materials for the same (or other similar) purpose constitute relevant evidence (*Mayer Parry* (2003b), Para. 67-68). In reference to criterion (d), as long as applicable product legislation can provide sufficient guarantees that the object, material or substance will not lead to adverse environmental or health effects then it is not likely that regulators will feel the need to maintain its more stringently regulated status as a waste.

Beyond these criteria, it is noted that the waste status of the relevant object, material or substance ends when the holder that is putting the non-waste material on the market for the first time can provide evidence of compliance with the above-mentioned criteria. In such a case, the waste status of the object, material or substance is removed at the point of transfer from said holder to another person.

To provide an example, in *OSS Group Ltd v. Environmental Agency* (2007a), the UK Environmental Agency argued that oil residues should be considered as waste, up until the time when that residue is burnt as a new source of energy. OSS, on the other hand, argued that the residue ceased to be waste following its treatment into a new energy source and prior to being utilised as a new energy source, which would have the same environmental effects as the original product. Carnwath LJ established that oil lubricants ceased to be waste following treatment with a waste recovery procedure. A test was established that “the holder has converted the waste material into a *distinct, marketable* product, which can be used in exactly the *same way* as an ordinary fuel, and with *no worse environmental effects*” (emphasis added).

On the basis of this case, in 2011, the UK Environment Agency took a further step, declaring that “the test set out in the *OSS* case is directly applicable to any waste-derived fuels, not just waste lubricating oil. It is also believed it likely that any other waste derived product meeting similar criteria (i.e. a distinct and marketable substance used in the same way as its virgin equivalent and with no worse environmental effects) would also cease to be waste” (Environment Agency, 2011).

In *OSS* the Court of Appeal of England and Wales recognised that a purposive approach was required in order to interpret the language of the Directive accurately. This purposive approach takes into account the fact that waste cannot be defined in isolation and that the holders of substances are required by the Waste Framework Directive to deal with substances in different ways depending on the Courts’ interpretations (Bell and McGillivray, 2008). Following this point, used waste oils or used vegetable oils can be used as raw materials to contribute to biofuel production providing that they satisfy the four criteria found in Article 6.

In the case *Van de Walle and ors* (2004c) the focus of the ECJ reverts to the question of intention, ruling that even if the holder of a substance accidentally discards it then that substance will become waste. In that case, petrol was spilled on soil accidentally and thus dissipated; the court ruled that both the petrol and any soil, where contaminated by hydrocarbons are treated as waste even where the soil had not been excavated following the spillage. This decision is thought to widen the latitude of cases which may fit the requirements of the definition of waste.

It should be noted however that Directive 2008/98/EC has excluded ‘*land (in situ) including unexcavated contaminated soil and buildings permanently connected with land*’ from the scope of the Directive by virtue of Article 2(1)(b). Similarly, if it is reasonable to assume that if a customer in receipt of off-specification products were to discard a portion of them, then according to both the 2008 Directive definition of waste and the sub Article 5(1)(a) requirement of certainty might have led to the off-specification’s characterisation as a waste.

However, there are two useful counterarguments to the effect; firstly, the holder of said off-specification product continues to be the manufacturer (thus, if the customer asks the manufacturer to deal with it then it is within manufacturer’s remit to decide the fate of the

product); and secondly, as such, if it does not intend to discard the off-specification product but to process it for a defined use then it may well not be treated it as a discarded waste.

The ECJ is the final arbiter in terms of the definitions of waste and specifying the dividing lines between waste, products and recycled products. The court has already begun stating its authority in the cases above, even though it has not always followed the same line of approach. *Van de Walle* could be seen to be in contradiction with *OSS*, but of course in the former case, petrol had been dissipated and soil was contaminated.

By way of a second example, in relation to iron and other metals for which the European Commission recently published Regulation 333/2011 (2011a), which entered into force on 8 October 2011⁷⁶. This Regulation focuses solely on scrap iron, steel and aluminium, and requires that these materials cease to be called waste upon conforming to a set of quality criteria and standards. On this point, the need to satisfy industrial specifications is of paramount importance in maintaining the argument that substances or materials are products and not wastes.

5.7. Waste Management in the United States of America

The Resource Conservation and Recovery Act (RCRA) sets the framework for the management of non-hazardous wastes in the United States of America (USA). The term *RCRA* is often used interchangeably with waste management regulations and the mandates of the US Environmental Protection Agency (EPA) (ORCR, 2011).

One of the differences between Waste Management regimes in the US and the European Union is in the subjects of such legislations. RCRA addresses every private or public enterprise irrespective of their size and seeks to engage every citizen. Whereas in comparison to EU's Directive 2008/98/EC in the latter instance, the very nature of the EU legal system requires the legislature to engage and address Member States, and to require them to incorporate the Directives into national laws and implement them subsequently.

⁷⁶ Council Regulation (EU) establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council, 2011. No 333/2011. European Union: Official Journal of the European Union.

As per section 1002(a)(4) of USA's Solid Waste Disposal Act, waste management activities and regulations are largely the responsibility of individual states, which enforce domestic waste related regulations (with the exception of Iowa and Alaska). The regulations enforced by states may be more stringent than those of the Federal government, but cannot be more lenient (Kolikkathara et al., 2009).

RCRA is an amendment to the Solid Waste Disposal Act (1965), which authorises the EPA to control hazardous waste from "cradle-to-grave" (EPA, 2012b). RCRA was first enacted in 1976 but has since been amended several times, the most significant of which being the Hazardous and Solid Waste Amendments (HSWA) of 1984. The HSWA amendment expanded the scope and requirements of RCRA (ORCR, 2011).

The Act is comprised of 10 Subtitles, where Subtitles C and D contain the two major programmes that comprise RCRA. These are the hazardous waste management programme and the solid waste programme.

5.7.1. Solid Wastes

Section 1004(27) of RCRA defines Solid Wastes as "any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities". The Act also explicitly excludes "solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923)."

It is interesting to note that the definition of Solid Wastes in RCRA allows for gaseous materials to be included, whilst the Directive 2008/98/EC of the European Union explicitly excludes them from the scope of that Directive.

The Solid Waste programme of RCRA is contained within Subtitle D of the same Act. The approach adopted by RCRA is similar to the European Waste Framework Directive's Waste

Hierarchy. As such, RCRA promotes “environmentally sound waste management practices that maximize the reuse of recoverable material and foster resource recovery” (ORCR, 2011).

5.7.2. Hazardous Wastes

Section 1004(5) of RCRA defines Hazardous Wastes in the following terms:

A solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may—

- (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
- (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Subtitle C of RCRA aims to ensure that hazardous wastes are handled and managed in a way which protects human health and the environment. The focus in this subtitle is to create a federal “cradle to grave” system for hazardous wastes. RCRA directly regulates generation, transportation, treatment, storage and disposal of hazardous waste. Therefore it is thought that the provisions in RCRA influence the majority of hazardous waste handlers, and have allowed the EPA to establish the most comprehensive hazardous waste regulations ever developed (ORCR, 2011).

5.7.3. Discard and Dispose

In the US, as with the case in the EU, much of the definition of a waste depends on the idea of discarding or disposing of an item (‘object, material or substance’ in EU Law). Extensive analysis surrounding the meaning of ‘discard’ is provided in section 5.3.3 above. In RCRA, the definition of Solid Wastes, which is the principal category in which the majority of wastes fit, is based on “any garbage, refuse or sludge” and “other discarded material”. Only one of these keywords, namely sludge, has been defined within the Act⁷⁷, while the rest seem to

⁷⁷ Sludge is defined as any solid, semi-solid or liquid waste generated from a municipal, commercial, or industrial waste-water treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effects (Section 1004(26A), RCRA).

have been left open to interpretation according to their common utility. This will inevitably give rise to ambiguities regarding the exact definition of Solid wastes.

Nevertheless, it will be attempted to decipher the language of the Act with the tools at hand. There are two aspects to the terms ‘garbage’ and ‘refuse’, namely when a product or item reaches the end of its life cycle, or when the holder of that particular item does not intend to utilise it any longer. By using the phrase “and other discarded material”, it seems that the Act focuses on the latter scenario and not particularly at the point where a product reaches the end of its useful life. Thus the Act seems to indicate that the scope of the definitions of ‘garbage’ and ‘refuse’ depends on the definition of ‘discard’.

On the other hand, it is questionable whether ‘using’ a material or substance can constitute it becoming a waste. In other words, will a substance or product which has reached the end of its life cycle automatically constitute waste? As far as municipal waste (a subset of Solid wastes) is concerned, it seems that this assertion is correct. Municipal waste has been defined by the Office of Resource Conservation and Recovery as durable goods, non-durable goods, containers and packaging, food waste, yard trimmings, and miscellaneous organic waste from residential, commercial, and industrial non-process sources (ORCR, 2011). Therefore, the definition seems to imply that when goods which fall into the stated categories reach the end of their respective life cycles (i.e. after being fully utilised), they constitute wastes. Furthermore, Table 3 below, which has been derived from RCRA and tabulated by the RCRA Manual, shows that in all seven possibilities, used material will indeed constitute waste.

The same analogy applies to Industrial Wastes, which are also a subset of Solid wastes. The RCRA Manual provides examples of wastes which may arise from a non-exclusive list of industrial activities. These are electric power generation; fertilizer or agricultural chemicals; food and related products or by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products; nonferrous metals manufacturing or foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment (ORCR, 2011). It is noteworthy that wastes resulting from mining activities or oil and gas production are excluded from the scope of industrial wastes but are included in the definition of solid wastes, whilst they are excluded from hazardous wastes.

In recent years there has been more attention being brought onto the issue of electric and electronic wastes. Europe and Japan have initiated “take-back” laws that require electronics manufacturers to recycle their products. However, in America only a handful of states have passed such legislation. This lack of consistency among the states has caused problems for companies that specialise in recycling, especially those that recycle plastics from complex waste streams and depend on take-back laws for getting the necessary feedstock (Anon, 2007).

5.7.4. Exclusions from RCRA

Subtitle D, which contains the regulations pertaining to the Solid Waste programme also provides details about the exclusions of Hazardous Waste within RCRA. Chapter III of the RCRA Manual also provides details of the exclusions enshrined in RCRA (ORCR, 2011). The EPA has also provided a full list of exclusions made by RCRA, which contains a collection of notes in relation to the full extent of exclusions which apply to hazardous wastes (EPA, 2012c). Generally however, there are five categories where the strict RCRA regulations do not apply. These are:

1. Exclusions from the definition of Solid Waste;
2. Exclusions from the definition of Hazardous Waste;
3. Exclusions for waste generated in raw material, product storage, or manufacturing units;
4. Exclusions for laboratory samples and waste treatability studies;
5. Exclusions for dredged material regulated under the Marine Protection Research and Sanctuaries Act or the Clean Water Act.

Some types and categories of hazardous wastes have been excluded by RCRA due to pragmatic reasons in relation to their implementation. For example, even though household washing liquids are hazardous when released into the environment, regulating them with the strict standards of RCRA will pose several practicality problems.

On the other hand, objects, materials or substances cannot be categorised as hazardous wastes if they do not meet the requirements of solid wastes. Therefore it is also important to examine which conditions will need to be met in order to exclude materials from being classified as solid wastes. Table 3 below depicts these exclusions.

These materials are solid wastes when...				
	Reclaimed	Used in a manner constituting disposal	Burned for energy recovery, used to produce a fuel, or contained in fuels	Accumulated speculatively
Spent Materials	√	√	√	√
Listed Sludges	√	√	√	√
Characteristic Sludges		√	√	√
Listed By-products	√	√	√	√
Characteristic By-products		√	√	√
Commercial Chemical Products		√*	√*	
Scrap-Metal	√	√	√	√

* If such management is consistent with the product's normal use, then commercial chemical products used in a manner constituting disposal or burned for energy recovery, used to produce a fuel, or contained in fuels are not solid wastes.

√ Material is a solid waste

Table 3: Solid waste exclusions (ORCR, 2011)

A full list of the exclusions to the definitions of solid waste and hazardous waste can be found in Appendix V below⁷⁸.

It is interesting to note that Scrap-metals⁷⁹ fit within the definition of solid wastes, but not necessarily meet the requirements of hazardous wastes; to that end, if scrap metals are reclaimed they will be classified as hazardous wastes, but if they are processed they will not satisfy the requirements of hazardous waste (ORCR, 2011). In light of that, the European Union's Regulation 333/2011, has also called for scrap metals and iron to be ceased to be waste upon meeting specific quality control criteria after undergoing treatments. It is likely that new EU regulations will be enforced in 2012 pertaining to the End of Waste status of scrap copper, paper and glass (Environment Agency, 2012b).

⁷⁸ Exclusions from the definition of hazardous waste are provided with a brief narrative in the 2011 RCRA Manual, page III-13. For a full list of the exclusions to solid wastes followed by short elaborative comments, refer to the 2011 RCRA Manual, page III-9.

⁷⁹ Scrap metal is worn or extra bits and pieces of metal parts, such as scrap piping and wire, or worn metal items, such as scrap automobile parts and radiators (ORCR, 2011, page III-7).

One of the differences between the approaches taken by RCRA and the Waste Directive 2008 is in relation to recycled materials. According to the approach taken by Directive 2008/98/EC, when materials are recycled the holder of those objects, materials or substances has already acknowledged that they have been classified as waste. Thus when the materials have been subjected to a recovery process, they will either meet the End of Waste criteria (as set out in Article 6) or not. If they do not meet those criteria then they will be treated as waste. Whereas according to the RCRA manual, after recycling, the material that has not been recycled fully will be subjected to a less stringent regulatory control, as the extent of regulation on recycled materials depends on the material and the type of recycling (ORCR, 2011).

This is due to the differing effects of recycling types on human health and the environment. Thus, RCRA has established three types of recycling which will fall outside the ambit of Solid Wastes, and four types where said materials are classified as waste. The flowchart below depicts these conditions.

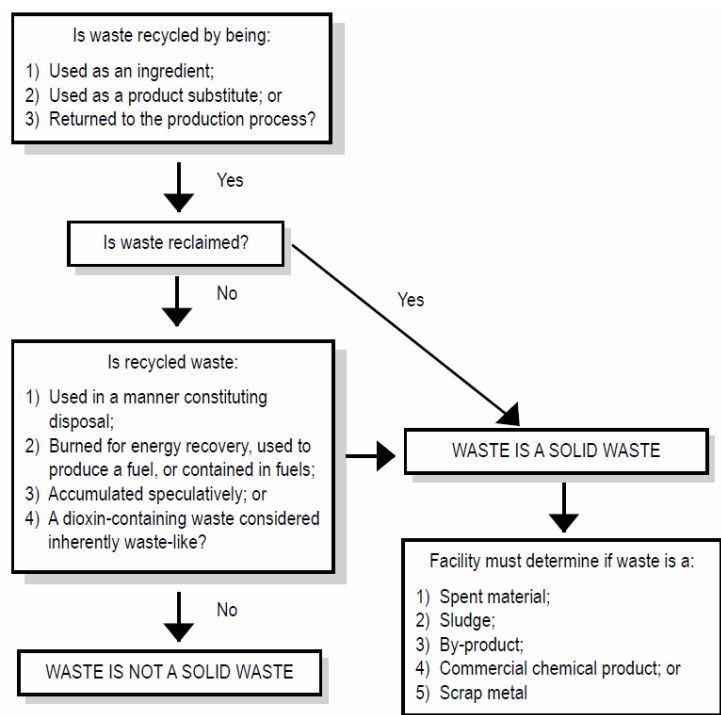


Figure 14: Flowchart indicating what falls into the Hazardous Waste criterion and what is excluded (ORCR, 2011)

5.8. Conclusions

As stated above, one of the objectives of the new Waste Framework Directive (2008/98/EC) is to encourage a sustainable use of resources (natural resources, *inter alia*) and production residues; the former through the establishment of the waste hierarchy and the end of waste criteria, and the latter through the introduction of by-products. However, in doing so, the legal definitions of terms used within said legislation are somewhat ambiguous to the extent that firms, such as Firm C were unsure about the correct classifications of a number of objects, materials or substances.

The creation of the new classification of by-products could potentially be a significant improvement to the old European waste management regime. However, the inherent lack of clarity may discourage firms from investing extra resources only in order to clarify the legal situation. Small and medium size firms may not even be able to internalise such costs and rely on the old regime, which would entail that any object, material or substance that is not produced intentionally (but which still can be of use in other circumstances) would automatically be labelled as waste. This would be completely against the philosophy of corporate sustainability, and more importantly against the objectives of Directive 2008/98/EC. Through benefiting from the legally defined by-product classification, more of objects, materials or substances can be reused in other areas of industrial activity as opposed to being confined to waste regulations; in which case, the operational and overhead costs to firms will increase even further.

As such, it is submitted that in contrast to Chapter 4, this Chapter demonstrates a company with a sustainability commitment regarding waste, though a Directive that is not well designed from a sustainability perspective hinders said firm's attempts of achieving its sustainability objectives.

By way of summarising the learning from this Chapter, at the European Union level, much of the analysis around the “waste” versus “(by-)product” analysis revolves around the interpretation of the 2008 Waste Directive Article 3(1) definition of “waste” and the Article 5 “by-product” conditions which, if met, will exclude substances, materials and objects from consideration as “waste”, therefore avoiding the application of Waste Directive requirements. It is noteworthy that Article 21 of the Waste Directive provides rules for the treatment of

“waste oils” but these rules are not directly on point in a “waste” versus “by-product” and “product” analysis.

Whether an off-specification product or by-product meets an industry standard is an important consideration as this is an indicator of its utility as a product and may establish certainty in respect of its use. Equally, following the 2007 Commission Communication, if the treatment method for the substance, material or object is a conventional waste management method then it is probable that the substance, material or object will be seen as a waste (sometimes, however, recovery activities that are part of a normal industrial production practice do not lead to this conclusion) (European Commission, 2007).

The same applies if a manufacturer perceives that a substance, material or object in their possession is a waste. Finally, if the manufacturer seeks to limit the production of said substances, materials or objects then this also may give the sense that it is a waste. In summary, though none of these are definitive tests, a positive response to any of the four questions below will incline a regulatory authority to perceive that the relevant substance, material or object is a waste:

- Is it treated with a conventional waste management method?
- Does the manufacturer (or the producer of the substance in question) perceive it to be a waste?
- Does the manufacturer limit production quantities?
- Is compliance with industrial standards absent?

In respect of the 2008 Waste Directive Article 5, namely the “by-product” exclusion, the response to each of the following five main questions must be affirmative. The sub-elements refer to evidence gathering which, according to the relevant case law, might be useful in determining the response to the main questions.

- Is further use of the subject or object certain?
 - Consider whether market demand equals or exceeds production levels;
 - Consider whether market demand is sufficiently robust to require imports.

- Can the substance or object be used directly without any further processing other than normal industrial practice?
 - Note that “further processing” concerns situations where additional “recovery” processes are required;
 - Hence, “product” characterisation is more likely where additional “recovery” processes are not required.

- Is the substance or object produced as an integral part of a production process?
 - Consider whether a chain of tasks forms an “integral” part of the production process;
 - Consider as well, whether the substance, material or object is required as part of the primary activities of a manufacturer (i.e., whether it is a standard part of the product lines). This establishes when the production of the substance, material or object is “integral” to the production process.
 - Evidence of substance, material or object compliance with industrial also demonstrates the qualities and characteristics of a “product”. High levels of quality control are thus demonstrated.

- Is the further use of the substance or object lawful in respect of product, environmental and health protection requirements for the specific use?
 - Here is important to consider both EU and national legislative requirements.

- Will said use *not* lead to overall adverse environmental or human health impacts?
 - Consider potential chemical reactions related to environmental and human health exposure;
 - Consider storage, use and disposal phase implications for greenhouse gas emissions;
 - Consider applicable European Norms (EN numbers) and how they might apply in relation to environmental protection guidance;
 - Consider a human health risk assessment in respect of the storage, use and disposal phases;
 - The respective remaining environmental impacts consider: odour, spillage, exposure effects, run off, releases to air and combustion potential.

Turning to the role and likely response of regulators, as is unwarranted, if said manufacturers are to apply a regulatory risk reduction strategy, the following observations are worth noting in addition to the two sets of bullet points immediately above:

- The default position of the regulator will be to characterise the substance, material or object as a “waste” not least because this preserves the 2008 Waste Directive “priority order” to apply the waste hierarchy (i.e., “prevent” and if not “prepare for reuse” and if not “recycle” and if not “recover” and if not “dispose”);
- A decision not to characterise a substance, material or object as a waste will likely require that an explicit decision be taken by a national regulator (or delegated regulatory authority);
- A decision not to characterise a substance, material or object as a waste will likely have to take into account, market and other conditions pertaining to that substance, material or object across much of the European Union;
- The environmental risks to be considered in each decision making process may well be unique to each substance, material or object and as such, must be addressed on a *case-by-case* basis. Said effects may not be confine to the three traditional environmental media (i.e., air emissions, run off to land, contamination of water) but these three tests constitute a good start noting that there must be *no* adverse environmental effects associated with the relevant substance, material or object; and,
- Where environmental offences lead to adverse environmental effects, said effects might be excluded by regulators to the extent that such circumstances would be subject to prosecution with associated remediation orders.

In the circumstances where products are known to be “off specification” after their production, every effort should be made to avoid “discarding” them so as not to run afoul of the 2008 Waste Directive definition of waste. The same applies to “off specification” products that have been received by the customer or are in the transport process.

To the extent that “off specification” products can be reintegrated into the production process, this is helpful in avoiding their characterisation as waste.

In respect of both “off-specification” products and objects, materials or substances that may be categorised as waste or not, as the case may be, it may be a useful strategy to negotiate

permit conditions with the regulator such that the regulator consents to their status as not being waste.

By way of an overriding conclusion, against the backdrop of the thorough responses required to the questions and considerations raised above there are clearly challenges involved in seeking to categorise any substance, material or object as a by-product or product rather than a waste.

Notwithstanding some conflicting trends in the ECJ judgements given above, this Chapter intends to help manufacturers and industrial operators to arrive at and justify practical conclusions as to whether certain objects, materials or substances that they handle are indeed “waste” according to European Union law or not. In this regard, the observations about how said economic operators should treat legislation and case law are important in building evidence as to why certain objects, materials and substances are not waste. To that end, the decision trees in Appendices II and III are straightforward and can be used as an additional tool for making waste/non-waste decisions.

There are three key caveats that apply to this Chapter. Firstly, the case law to date is based upon legislation and cases that pre-date the 2008 Directive that are still binding. Second, the surrounding circumstances that concern any waste/non-waste decision are both determinative and superseded the hypothetical examples given in this Chapter. Finally, in at least some jurisdictions, legislative uncertainty in respect of the Waste Framework Directive has caused Member States to take the pre-caution of issuing substance-by-substance regulatory position statements in relation to the waste/non-waste status of substances (Environment Agency, 2012a).

Given the potentially significant adverse risk that attends the legal uncertainty surrounding selected materials or substances, manufacturers should consider that in selected instances they should seek greater legal certainty (and therefore potentially reduced commercial and regulatory risk) directly through interactions with relevant Member State regulators (directly leads to rule 3.4). This, together with the recommendation that firms should compile a decision-making framework similar to that produced in Annex IV are part of the Rules produced in Chapter 7 pertaining to Economic Sustainability. The findings of this Chapter have also helped drafting the rest of the rules in relation to economic sustainability, such as

limitation of regulatory risks pertaining to environmental matters and climate changes, and designing decision making tools for the firm in question.

Rules 3.1 to 3.6 in Chapter 7 (on economic sustainability) have been drawn in the view that confusion and uncertainty within the business community leads to increasing risks to operational risks. If not contained, these risks could be against the spirit of corporate sustainability.

After clarifying the current Waste regulations of the European Union as it applies to Waste, Products and By-Products, Chapter 6 will examine the significance of social sustainability as part of a given firm's overall corporate strategy. In doing so, examples are provided pertaining to adverse consequences of lack of adherence to social sustainability (or corporate social responsibility).

6

SOCIAL SUSTAINABILITY

Chapter 6: Sustainability in the Mining Industry: case study of Rio Tinto Plc.

6.1. Introduction

Aspects of Corporate Governance in relation to corporate environmental disclosure, Environmental Sustainability in relation to technological advancements in wastewater treatment plants, and Economic Sustainability in relation to waste management legislation have been discussed thus far. This Chapter intends to examine the aspects of business sustainability, in particular Social aspects, in the mining sector in relation to human rights, human capital and the broader effects of unsustainable corporate activities on the business of firms. In particular, this Chapter focuses on Rio Tinto Plc. as a case study. To do so, a brief outline of the academic debate surrounding the concept of Social Sustainability is provided.

It has traditionally been commonplace for economic entities solely to focus on the economic viability of their business operations, while a recent movement has led such entities to also

heed the environmental effects of their business operations. It has been suggested that in light of the traditional focus on economic viability and environmental sustainability, the social aspect of sustainability has been overlooked and thus, attracted least attention from business organisations and academics (Hutchins and Sutherland, 2008). However, to the contrary it is found that social sustainability and its affiliated subject areas have been more vigorously debated than economic viability within a sustainability context. Hutchins and Sutherland believe that social sustainability has received little attention in the literature, and when discussed, has emphasised legislative issues or human health and safety rather than the cultural and ethical ramifications of decisions (2008). The main problem, in the author's opinion is not the lack of attention to social issues within academia, but rather that the pillar associated with the social dimensions has not been defined to a sufficient extent within the overall sustainability debate; though it is argued that this is due to the very nature of this discipline, and that the definition of *social sustainability* is no vaguer than those of environmental and economic sustainability (McKenzie, 2004).

The author, however, accommodates the view that the social aspect of sustainability should become a major source of strategic overhaul for large and multinational firms; this is so in particular due to the adverse financial implications (for firms) which can arise from adverse relationships with external stakeholders. In many respects, it has been argued that social sustainability is the basis of the discipline of corporate sustainability (Dillard et al., 2008). To that end, Dillard et al. seem to believe that the concept of sustainability is in fact a subset of social sustainability. As such, according to their definition, the social aspect of sustainability should be understood as both (a) the processes that generate social health and well-being now and in the future, and (b) those social institutions that facilitate environmental and economic sustainability now and for the future (Dillard et al., 2008).

A narrower definition of social sustainability was provided, as “a socially sustainable system must achieve fairness in distribution and opportunity, adequate provision of social services, including health and education, gender equity, and political accountability and participation” (Harris et al., 2001). McKenzie defines social sustainability as “a life-enhancing condition within communities, and a process within communities that can achieve that condition”, while advocating that a number of factors are indicators of said condition, and steps towards their establishment and implementation are aspects of the process (McKenzie, 2004). These factors include equity of access to key services, generational equity, a system of cultural

relations in which the positive aspects of disparate cultures are valued and protected and cultural integration is supported and promoted, political participation of citizens, a system for transmitting awareness of social sustainability and a sense of community responsibility for maintaining that system of transmission, and other similar factors (*Ibid*).

In 2003 a major study by the Academy of Social Sciences in Australia measured social capital and sustainability in six rural centres using a framework which divided ‘capital’ into five subsets (Cocklin and Alston, 2003). The aim was that these ‘capitals’ would provide a framework within which to categorise, measure and assess community and social change. The suggestion was that sustainability could be measured in terms of the change in each capital stock. These five subsets (capitals) are as follows:

1. Natural (natural resources, ecosystem services and aesthetic value)
2. Human (knowledge and skills of individuals)
3. Social (productive networks and shared values)
4. Institutional (institutional structures in the private, public and third sectors)
5. Produced (the built environment, harvested or manufactured goods and monetary resources).

It is deemed that one of the main intangible assets of firms is their human capital, which is central to the five capital model presented by Cocklin and Alston – more discussion about this will follow shortly.

There is little contention about the necessity for the overarching debate of sustainability and the objectives it aims to achieve. However this does not seem to be the case when the debate is refined to focus on social sustainability in particular. Thus, notwithstanding the above, it is asserted that the concept of social sustainability is not yet crystallised within academic or business domains, and as such the list of possible component elements is non-exhaustive (Dempsey et al., 2011, Dillard et al., 2008). For example, it is unclear what ‘social matters’ really means, whilst the suggested components seem to consist of “selection of assumptions, goals, and indicators of socio-political provenance” (Littig and Griessler, 2005).

At its core, however, the concept of social sustainability inherently deals with the interpersonal aspect of the effect of business operation of a firm. There are many aspects, as

examined above which social sustainability theorists believe firms should promote in order to reach a sustainable state within communities. However, central to all of those conditions and factors is adherence to basic human rights by corporations and by those within the value chain of firms. In fact, academics such as Gary Larsen believes that “at the heart of the concept of social sustainability is the notion of greater equity in access to resources and the realization of basic human rights for all, across space and time (Dillard et al., 2008).” Human Rights are also of particular importance in the business operations of multinational firms whose operations are labour intensive (for example, in the case of the mining industry). As such, a significant portion of this Chapter will look into the importance of adherence to human right to corporate sustainability as a whole.

Human Rights is a technically oriented legal term which has a distinct meaning depending on the applicable jurisdiction, which in turn depends on one’s geographical location, their nationality and the location of an accident. The legal scope and definition of Human Rights has clear boundaries and is not open to subjective interpretation by individuals or other entities alike.

In recent years there has been a global shift in the way that business is perceived, which has led to concerns about the sustainability and social responsibility of firms in many industries and countries; this is none more so than in the mining industry (Jenkins and Yakovleva, 2006, Hamann, 2003). The importance of the mining sector in the global debate on sustainability can be attributed to the industry’s potentially significant negative social and environmental impacts as well as the inherent finiteness of the resource body (Hamann and Kapelus, 2004). The exploration, extraction, exploitation and processing of mineral resources is widely regarded as one of the most environmentally and socially disruptive activities undertaken by business (Hilson and Murck, 2000). As such, many environmental catastrophes and human and labour rights abuses which have led to the global debate surrounding the urgency for sustainable businesses have their roots in the mining industry (Warhurst, 2001). As such, it is thought that the mining industry would provide an excellent basis for exploring the topics in the debate surrounding the social aspect of corporate sustainability.

Sustainability strategies differ from one firm to another based on said firms’ operating sector, business challenges and many other criteria. As such, the issues which will be highlighted in

evaluating the sustainability efforts of firms in the mining sector will differ from those examined in other sectors, such as banking and finance. To that end, it is stipulated that environmental management, adherence to human rights and labour conditions and a firm's human capital are paramount to the issue of sustainability within a mining firm. These are the issues which will be examined in this Chapter.

To do so, the first step is to embed Human Rights within the ambit of a sustainable business strategy. This will be done through a thorough examination of the academic and practical definitions of both terms. Examples of large and multinational mining companies who have embraced this idea through good practice are provided. This will help in understanding the practical aspects of Human Rights as a form of sustainable business strategy. After explaining the value of human capital (a term that is not meant to undermine the intrinsic value that all human beings possess) and providing a statistical analysis of mining accidents, the Chapter takes account of the Human Rights perspective in the determination of sustainability in such firms. Evidence of good practice will follow examples of mismanagement, resulting in ground control failures leading to the loss of human capital. The Chapter concludes by providing a demonstration of the economic importance of adhering to Human Rights laws in all underground coal mines where accidents caused by rock falls can potentially happen.

This Chapter examines the way in which the term sustainability has been viewed and what sustainable strategies have been adopted in the mining industry (by global market players). The focus of this Chapter is Rio Tinto Plc., while examples of Vale and BHP Billiton are also provided to compare and contrast the theme of sustainable development in the context of said mining companies. These firms are the three largest mining firms and all operate on a global scale. As such, it is thought that an evaluation of these firms' sustainability agendas will provide a fair representation of the global mining industry.

6.2. Human Rights in Public International Law

'Human Rights' is an area of international law that, like many other legal terms, can potentially be highly contentious and cause political problems. This is due to the sensitive nature of the law in this area, in that it deals specifically with the basic needs and rights that are internationally agreed to be necessary for all human beings, irrespective of the country in which they reside. Of course, there is an inherent limitation to this notion, such that a country

which has not ratified the Human Rights Convention has not explicitly agreed to afford the same level of protection to its citizens as the ratifying States have. Nevertheless, customary international law, as one of the principal sources of international law plays a significant role in such circumstances. Article 38(1) of the Statute of the International Court of Justice (ICJ), which is widely regarded as the most authoritative and comprehensive statement as to the sources of international law specifically refers to custom as one of its sources.

International law scholars tend to agree that there are two broad sources of international law, namely customary and conventional, of which, the latter is the only universal source (D'Amato, 1995). *Custom* in international law can be referred to as a dynamic source of law in the light of the nature of the international system and its lack of centralised government organs (Shaw, 2008). There are many arguments for and against customary international law, especially regarding its diminishing role in the international sphere due to its inherent imprecision; however, one ought to note that this ambiguity reflects flexibility as well as ambiguity (*Ibid*).

Due to the existence of the Universal Declaration of Human Rights (UDHR), the European Convention on Human Rights (and measures provided in other international treaties alike) and the incorporation of their rules and principles in national and municipal legislative bodies, it is difficult to exclude human rights from the boundaries of customary international law (D'Amato, 1995). This means that even when a country/state has not ratified a Convention or a Treaty, that State will still be held liable to its provisions due to international consensus. The Universal Declaration of Human Rights, generally agreed to be the foundation of international human rights law, was devised by the United Nations (UN) in 1948, when the UN had only fifty six Member States (United Nations, 2013). All current members of the United Nations are thought to be ratifying parties of the UDHR.

It is important to note that the law pertaining to health and safety at work and those regulating working conditions could be seen as emanations of human rights. As such, there is often a significant extent of overlap between the provisions of the said three bodies of legislations. However, that is not to say that all breaches of health and safety regulations or those pertaining to working conditions are tantamount to a breach of human rights. In the former case, local legislation often is capable of addressing injustices occurring towards labour, whilst in the latter scenario the state in questions will become liable under international law.

6.2.1. Economic and Business Significance

In almost all jurisdictions the legal personality of entities is recognised and is actionable at law (Shaw, 2008). Thus, an individual may initiate criminal proceedings against another for assault while a company may bring claims (or indeed be sued) for breach of trust or contract. These are all possible by virtue the recognition of legal personalities. In the same light, international law also recognises the standing of entities, which in turn allows these entities to invoke the provisions of international law. However, unlike national law, international law generally only provides standing to States and does not recognise individuals or companies. Therefore in international law, rights and responsibilities are given to states as opposed to individuals, and international bodies such as the International Court of Justice will not hear the claim of an individual. However, there are a few exceptions to this rule, in that some non-state actors have attained legal standing in recent years.

There is unending debate about the rights and obligations of international and multinational companies *vis-à-vis* international law. The status of such enterprises and their rights and responsibilities in the international arena is important due to the trans-boundary nature of their business operations and the impact they have on the citizens of several states. One of the most contentious questions in this debate is the legal effect, if any, of a framework specifically made for multinational firms (Shaw, 2008). To that end, there is yet to be a conclusive, legally interpreted set of responsibilities for such enterprises. That is not to say that public international law has no effect on firms in the private sector; international law has an indirect effect on private sector firms since international and European regulations are initially incorporated into national law and subsequently, depending upon their subject matter, can require regulatory compliance or induce other changes in the activities of firms.

Efforts have been made to impose responsibilities on large and multinational companies, particularly in the area of Human Rights. As such, the UN Sub-Commission on the Promotion and Protection of Human Rights unanimously passed the “Norms on the Responsibilities of Transnational Corporations and Other Business Enterprises with regard to Human Rights” in 2003 (NRTC). The NRTC represented the first set of comprehensive international human rights norms specifically aimed at and applying to transnational corporations. Together with the interpretative commentary, the document has been seen as an authoritative guide to corporate social responsibility (Hillemanns, 2003).

The NRTC sets out the responsibilities of companies with regard to human rights and labour rights and provides guidelines for companies in conflict zones. The basic system of enforcement for this document is stated in its Article 18, in that “[transnational] corporations and other business enterprises shall provide prompt, effective and adequate reparation to those persons, entities and communities that have been adversely affected by failures to comply with these Norms through, inter alia, reparations, restitution, compensation and rehabilitation for any damage done or property taken.” The drafters of the NRTC assigned a legal duty to the obligations stated therein, which were later revoked by the UN Commission on Human Rights in 2004, due to heavy criticism by business representative bodies (Ruggie, 2007).

Though the NRTC did not evolve into either a binding document or an industry standard for human rights behaviour, the subsequent 2011 Guiding Principles for Business and Human Rights (2011 Guidelines) may rightly be seen as the progeny of the NRTC. Like the NRTC, the 2011 Guidelines (which really just feature nuanced rather than major differences compared to the NRTC) constitute *soft law* with the possibility that the 2011 Guidelines may someday evolve into hard law.

Putting the soft versus hard law benefits and disbenefits of these instruments to one side, it is important to recognise the potential disconnection or discontinuity that may arise should the evolution of international human rights law pertaining to corporations occur in a manner that offers nations (i.e., the fundamental units of public international law) a basis for ignoring or otherwise failing to meet the requisite standards of human rights protection that their citizens deserve. Consider the scenario in which a transnational mining firm provides such human rights-related protections and the host mining country (i.e., in a least-developed country) does not. Such a state could argue that it is being left to the transnational firms operating within the host state jurisdiction to uphold human rights norms. Hence, the incentive provided to the host state to relax its approach to human rights. This situation is exacerbated should the relevant firms choose to withdraw such protections (noting their soft law status as regards the firms themselves in the absence of national law) as this implies the absence of an apparatus in the host state for the protection of the said rights.

Multinational corporations are defined loosely by The Organisation for Economic Co-operation and Development (OECD) as “usually comprising companies or other entities

established in more than one country and so linked that they may co-ordinate their operations in various ways” (OECD, 2008). Accordingly, the world’s largest and most influential mining companies, such as BHP Billiton, Rio Tinto and Vale all fit well within this definition. Thus, it is stipulated that NRTC has been drafted with the likes of these corporations in mind and thus should be applicable to them.

Due to the private/shareholder ownership structure of the large mining companies (and indeed most large companies) they are not seen as world players in public international law. However, there are indeed companies which can be subject to international litigation by the ICJ. These are companies which are state-owned and thus will be seen as direct emanations of the state. This will in turn mean that the state is responsible for their activities, which will make them accountable in international law and to the International Court of Justice.

The authority in case law pertaining to a state causing (or allowing to be caused through omission) damage to another state through the territory of the former is the Corfu Channel case (1949). The case concerns sea mines within the territorial waters of Albania which exploded and led to the death of 45 British sailors and personnel and significant damage to the ships involved. By holding Albania responsible, the ICJ established a principle in its first ever hearing that every state has the obligation not to knowingly allow its territory to be used for acts contrary to the rights of other states (Mendis, 2006).

Another noteworthy case in this respect is the arbitration that took place between the United States and Canada in 1941, where Canada (based on this principle) assumed responsibility for the actions of a private company in the Trail Smelter case (1941). Canada was found liable to the United States for damage and injury caused by fumes carried by the winds from a privately owned company of a smelter in Canada and was later required to prevent such damage in the future (Verma, 2004). In the Trail Smelter case Canada was held liable even though the entity in question was a private company. This was primarily due to Canada’s responsibility as a state to control pollution being transferred from within its borders to the state of Washington in the US. Therefore there was limited or no control by Canada over the private company and how it operated. This case is, therefore, good legal precedent for states in public international law being held responsible for the actions of private companies. Perhaps the best known statement within the judgement of the Court was that “under the principles of international law, no State has the right to use or permit the use of its territory in

such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence” (Sands et al., 2012, p. 196).

There are also cases where liability would more easily be attributed to the state, by virtue of state-ownership of companies. For example, Shenhua Energy, the world’s largest coal mining and energy company and the National Iranian Copper Industries Company (N.I.C.I.CO), Iran’s largest copper mining company are both state-owned/controlled companies in China and Iran respectively (Company Profiles, 2012, Mehrabian, 2011). In such cases transboundary pollution or other offences under public international law attributable to the activities of these two companies (and of other state-owned firms) would be seen as shortcomings of the state involved.

In respect of the world’s largest mining firms, it is common that their headquarters are registered in developing countries such as the UK, US and Australia. For example, Rio Tinto is an Anglo-Australian company with operations in many third countries, which are conducted under the auspices of subsidiary companies of Rio Tinto. It is a general legal understanding that should a miner fatality or serious injury occur in a third country in which a given mining firm has a subsidiary company, then the subsidiary will be liable for the reparations arising of the fatality or other such legal claims. As such, in the case of fatalities, many developing countries have statutory or other limitation rules with regards to compensatory payments, which can be far lower than what an equivalent court in a western country would order. This would, therefore, result in a calculated reduction of risk of such legal claims by multinational mining companies.

However, in *Connelly v. R.T.Z Corporation Plc. and Others* (1997a) the plaintiff, an employee of Rio Tinto’s subsidiary company in Namibia claimed that the parent company in the UK, not the subsidiary company in Namibia, was liable for the negligence which caused the plaintiff’s illness. The House of Lords not only recognised the legal standing of the plaintiff in a UK court but also granted him ‘legal aid’ in order to initiate the legal proceedings. In his dissenting judgment, Lord Hoffman stated that “[if] the presence of the defendants, as parent company and local subsidiary of a multinational, can enable them to be sued [in the UK], any multinational with its parent company in England will be liable to be sued here in respect of its activities anywhere in the world” (para. 41). Therefore, there is a

clear possibility that breaches of human rights by subsidiary companies of a multinational firm will be heard in the courts where the parent company is based, in which case the settlement costs could be much higher than those attained in the courts where the subsidiary company is based. This possibility becomes that much more likely if it can be established that the parent headquarters was reasonably understood to be the source of the guidance, practice, authorisation, act or omission that led to the harm caused to the individual.

In *Lubbe and Others v. Cape Plc.* (2000c) the House of Lords again allowed a group action by some 3,000 plaintiffs of Cape Plc., whose headquarters were in the UK but its South African operations were controlled by a local subsidiary company. This was a case on the lack of health and safety measures in place which resulted in the rising level of asbestos dust above the legal limit in the UK.

In addition to the case law of England and Wales, consider the further example of a national statutory instrument that applies to the overseas activities of transnational firms. That example is the United States Alien Tort Claims Act (ATCA) a section of the United States Code (the section originated in 1789 as part of the Judiciary Act of 1789) which offers the remedy of damages for violations of international human rights law. ATCA is used in part to provide tortious remedies to alien persons to the United States of America for breaches of international law including by companies. Many of its cases litigated over the past 15 years concern alleged cooperation between a host state and a company which leads to the death or severe injury of plaintiffs. Examples include financial incentives offered to governments by companies that are not granted in accordance with law (i.e., that can be seen to be corrupt in some way) or cases where damage is occurring to a firm's assets and a request by the firm is made to national enforcement authorities to become involved and this leads to the merciless application of force against people.

It is not difficult to conceive that tortious conduct (i.e., breach of a duty of care to people) can be synonymous with the breach of a human right. As such, this court's rulings are relevant to the subject matter at hand. Though there is evidence of a certain ambiguity about the application of ATCA to American firms for their activities abroad, a number of cases stand for the proposition that firms are in principle liable for damage that arises in their overseas activities. The case of *Filártiga v. Peña-Irala* (1980) cemented the notion that foreign citizens could seek remedy from US-based firms for Human Rights abuses. Cases such as

Bowoto v. Chevron (2008a) and *Romero v. Drummond Company* (2008d) (a mining case with Columbia as the host state) confirmed the liability in principle of American corporations related to their overseas activities. *Kiobel v. Royal Dutch Petroleum* (2012) stands in opposition to these judgments on the matter of corporate liability under the ATCA but it does not overrule them.

As the abovementioned cases have the United States and England and Wales as their *national* jurisdictions it is right to observe that a clear gap in the *international* legal framework is apparent in holding multinational firms accountable to human rights and their stakeholders in relation to business sustainability. Therefore, in the absence of such measures, market forces have somewhat succeeded in altering the behaviour of the world's largest firms. Market forces refer to the changes made to the customers' (and consumers') perception of the end product in light of the 'enlightened stakeholders' principle and market competition. Currently, there is clear evidence that mining companies have committed to human rights policies and voluntarily submit reports on improvements of adherence to such policies to professional and regulatory bodies (ICMM, 2012, Mining Weekly, 2012). However, as it is explained below, these efforts fall short of an adequate corporate sustainability strategy. In the more developed economies, such as the United States and the European Union, this movement is driven by non-governmental organisations (NGOs), consumer groups, and in some cases by companies who wish to change/improve their reputation and brand awareness by market leadership in sustainability.

It has become clear from literature and market activities that companies in most industries have become aware of the consequences of their business operations on their stakeholders and the environment. One of the most valuable stakeholder groups for a labour-intensive company (such as mining firms) is their employees, also referred to in economic parlance as Human Capital. In developed countries (such as the US and UK) adhering to human rights is seen as the minimum accepted standard for those engaged with physical and manual mining operations. Furthermore, mining is considered as a hazardous occupation by the International Labour Organisation (specialised agency of the UN), where remuneration reflects the risks labourers face during their daily activities (ILO, 2010). Nevertheless, in many developing and least-developed countries working conditions are not only poor but also fall below the accepted standards in the same country (Dreyer et al., 2006, Oraee et al., 2010). Articles 5 – 9 (Section D) of the NRTC oblige multinational companies to provide a healthy and safe

working environment and to provide such remuneration that would ensure an adequate standard of living for said employee. It also prevents said companies from employing child labour and imposing work against an employee's will. The value of Human Capital and its importance to mining companies will be discussed further in the subheading below on Business Sustainability.

6.3. Corporate Sustainability in Mining

Actions of large and multinational companies have a more significant effect on a global scale compared to those of small or medium sized businesses. Therefore, it is of crucial importance for the society in which companies operate that said company abides by a sustainability strategy, be it environmental, economic or social sustainability. Many corporations adapt such strategies as a means to differentiate themselves from competitors or otherwise reduce overhead costs or other general costs of conducting business (Schaltegger and Burritt, 2006).

Sustainability can come in many ways depending on the industry in which a company operates. For example, in the Oil and Gas industry and manufacturing, environmental protection is of crucial importance whereas in the banking and finance industry, appropriate corporate governance mechanisms may be more helpful than environmental or social activities for the entity's long term viability. As such, the traditional three pillars of sustainability (i.e., the economic, social and environmental pillars) may not be given the same weight across all industries and sectors. To that end, even Milton Friedman's suggestion that "the social responsibility of business is to increase its profits" could very well form part of a business sustainability strategy, in the view of corporate accounting and financial sustainability (Friedman, 1970). However, a more modern approach to business sustainability could be summarised by Nobel Laureate Joseph E. Stiglitz who states that "we should think about how we can create a global economic architecture which works better, for more people, in a more sustainable way" (UN, 2009).

Many academics argue the three pillars of sustainability are as important as one another whilst others believe depending on the industries, the nature of the business, or simply the issue at hand for a given firm, different weights are given to each of the pillars (Pope et al., 2004, Slaper and Hall, 2011). The analysis in this Chapter is based on the latter theory. For example when dealing with the internal mechanisms of a company and its corporate

governance, one tends to highlight the Economic pillar, albeit that the implications of the problem at hand (i.e. lack of appropriate environmental accounting and disclosure of information) stems directly from the Environmental pillar (See Chapter 3). The focus of this Chapter is the business components of mining companies which directly affect their economic sustainability. This is done through employing the widely used indicators called the Global Reporting Initiative (GRI) and the inter-relationship between the components of said indicators. As a variation on the GRI, there is a tendency to conceive of these indicators when applied with appropriate metrics designed by the authors, as the basis for judging the sustainability of firms.

6.3.1. Human Capital

According to Theodore W. Schultz, a pioneering scholar of the theory of Human Capital, valuing the amount of utility or worth of a labour force was frowned upon by American society in the early 1960s (Schultz, 1961). As such, it was only in the late twentieth century that economists and business scholars began to appreciate that people, not cash, buildings, or equipment, are the critical differentiators of a business enterprise (Fitz-Enz, 2000).

In economic theory, labour is considered as one of three production factors (Sexton, 2008). Companies invest heavily in training and skills development of their labour force in order to increase labour productivity and efficiency. This is exacerbated in the case of labour-intensive companies. For example, modern cement manufacturing plants or electricity power plants rely on highly skilled and trained technicians and engineers but in lower quantities compared to mining or car manufacturing companies. As such, it becomes clear that a firm's collective labour force is a valuable 'capital', in which said firm deliberately invests in the long term (Schultz, 1961). The following example was given by Jac Fitz-Enz in *The ROI of Human Capital* on the leverage that Human Capital brought to companies (2000):

“In April 1999, investment bank Goldman Sachs launched an initial public offering (IPO) that drew a market value of [US]\$36 billion on its opening, a value four times that of its hard assets. If we subtract the book value from the [US]\$36 billion and divided that by the number of employees at the time of the IPO, we would see a dramatic example of the market's appreciation for human capital leverage.”

To that end, a study in 2005 by Corrado (et al.) examined the relations between human capital, productivity, and market value, where strong positive links were found for measures of human capital and productivity. As such, it was found that human capital is related to market value even after controlling for total physical assets. Furthermore, the component of skill with factors that are unobservable (quantitatively) is most closely related to market value (Corrado et al., 2005).

Therefore, it seems to be a sensible approach to invest in training and skills development of the employees, given that it is clear that ‘people’ make money for companies (Fitz-Enz, 2000). Many firms nowadays understand the value of Human Capital and invest appropriately therein in the form of training and development of required skills. For example, in 2011, Rio Tinto recorded some 870,000 attendances for training in leadership and environment (for managers), and technical and operational skills, health, and safety courses (for manual workers/miners) (Rio Tinto, 2012). In BHP Billiton, non-executive Directors participate in structured training and development programs to build knowledge of specific business and market, environmental, social and governance issues (BHP Billiton, 2012). BHP Billiton also offers a wide range of training and flexibility in working conditions as needed by their employees (although their Annual Report is apparently shy of producing quantitative data in this regard).

The focus here is on the appreciation of the value of the firms’ human capital by mining companies. It is noteworthy that Vale, Rio Tinto and BHP Billiton use the GRI framework in their sustainability reporting. As such, all three firms look at areas of training and development for their employees and adhere to human rights standards in the GRI framework. However, they seem to miss the link between the positive effects of good management of Human Capital (i.e. in Labour relations and Human Rights aspects of GRI) and the subsequent economic benefits to the company. As such, all three companies briefly explain their strategies on employee welfare and human rights, as well as their separate philanthropic advances in the society, without noting the related economic value brought to the company. Although it is clear that the companies in question have initiated a path towards sustainable development, it is stressed that at least in the case of Rio Tinto, there is much room for improvement.

However the situation in mining companies in developing countries such as China and Iran is much worse than those in the large international firms. These two countries have been chosen due to the importance of their respective mining sectors to their entire economy. China is the largest consumer of minerals in the world and as such there is great domestic demand for the products of China's mining industry. This is especially the case as the Chinese Government in 2011 decided to decrease its mining exports by 35% in order to meet domestic demand (BMI, 2013). Whereas in the case of Iran, it has been stipulated that a third of the national economy is dependent on the activities of the mining sector (Oraee, 2009).

Both countries also have an appalling fatality rate in their respective mining sectors, where China has the most hazardous mining conditions in the world, followed by Iran's fourth global rank (Feng and Chen, 2013, Mehr, 2011). The table below shows a comparison of Coal production between China, Iran and the US and their respective fatalities.

Country	Coal production (thousand short tonnes)	Fatalities	Death per short tonnes of production (%)
China	3,844,942	1,973	0.0513
Iran	1,294	25 (in 2010)	1.9320
US	1,094,336	21	0.0019

Table 4: 2011 Coal production statistics and corresponding fatalities by country (EIA, 2013)

In 2011 the number of fatalities in China's coal mines fell to a record low of 1,973, while in the same period in the US there were 21 deaths (Feng and Chen, 2013, WCA, 2012). This is despite China producing more than three times more coal than the US (Table 4). Therefore, if Chinese domestic mining firms implemented the same level of health and safety safeguards as is common in the US coupled with using equally advanced technologies, their fatality rates should be approximately 73 deaths. Separately, in the period of March 2009 to March 2010 (Iranian calendar year), some 25 fatalities occurred in Iran's coal mines, which when extrapolated to the same level of coal production of China, it will be as high as 74,284 fatalities in that period (Jahan News, 2011, EIA, 2013).

Loss of life (loss of labour as a source of production) at such a high rate represents high costs to the employers of said miners. These costs arise from several sources, such as the amount the employer has invested in training and development of said miners, legal costs, insurance payments, loss of earnings as a result of mine closure, repairing the damage caused to the

roofs and walls of the mines concerned, repairing or replacing machinery, re-training new employees and so on.

Accordingly, the US Department of Labor has produced an online tool for calculating the cost of mining fatalities (MSHA, 1998). Given sufficient data, the tool will calculate the estimated annual accident costs and the impact of accidents on profits and sales. The tool estimates that the cost of one death (only the cost of death, not subsequent costs) as a result of a mining accident in the US was US\$910,000 in 1998 (1998 has been used as the index year). Calculating the nominal value of US\$910,000 using the average Consumer Price Index in the US, the value reaches US\$1.28 million (US\$1,281,782.45) in 2013. As such, it is a valid assumption that the cost of 21 fatalities in 2011⁸⁰ in US coal mining would have reached US\$27 million. This figure only represents the cost of losing those employees, and not the overall cost resulting from individual accidents.

Assuming that the same level of costs are valid for China and Iran⁸¹, in 2011 in China the cost of losing 1,973 miners would be US\$2.5 billion, while in Iran in 2009-2010 it would be around US\$32 million (25 fatalities). In order to view these figures in the correct context in China and Iran, the Purchasing Power Parity⁸² (PPP) data provided by the World Bank is a useful tool (World Bank, 2013). As such, in China the cost of 1,973 deaths in the mining sector in 2011 would be US\$1.5 billion and in Iran in 2009-10, the cost of 25 mining fatalities would be US\$12.8 million.

However, Iran's annual coal production is negligible compared to that of China. Therefore, with the same rate of fatalities per tonne of coal production in Iran, if Iran produced as much coal as China, then, *ceteris paribus*, fatalities would have reached 74,284 deaths. In that case the cost of such fatalities would have reached around US\$95.2 billion, which after taking account of the PPP indicator will be US\$38 billion (in 2009-2010)⁸³. Costs as high as this will not only dissolve any given mining firm, but will also have devastating effects on Iran's current economy as a whole.

⁸⁰ Figures and calculation adjusted for 2011 inflation rates, fatalities and production values.

⁸¹ The Author recognises that the cost of mining fatalities in China and Iran is likely less than those in the US, due to lower operational investment and costs of training and health and safety provisions, *inter alia*.

⁸² Measured against the United States, where for China PPP is 0.6 and for Iran it is 0.4.

⁸³ 73,400 deaths at a cost of US\$1.28 million each.

Whilst there should be no tolerance to a single fatality in mines, it would be incorrect to assume that Chinese and Iranian state-owned mining firms invest as much as American mining companies (or multinationals such as Rio Tinto and BHP Billiton) do in addressing fatalities. In fact, with China being the most dangerous mining country and Iran following as the fourth most dangerous, it is not an untenable assumption that health and safety, emergency health training, human rights adherence and general working conditions fall well below the standards of international mining companies and those in the US. Table 5, below, demonstrates how costs of miner/employee training would compare, hypothetically, among the three given countries. For this, the global price of coal as of 05 February 2013 has been taken as US\$58.25 (InfoMine, 2013). The costs of fatalities in Table 5 represent the costs which have been calculated using the PPP data provided by the World Bank.

Country	Coal production (1,000 short tonnes)	Revenue (US\$)	Fatalities	Cost per revenue (with PPP)
China	3,844,942	223 billion	1,973	0.67%
Iran	1,294	75 million	25 (in 2010)	17.1%
US	1,094,336	64 billion	21	0.04%

Table 5: Comparing the cost of fatalities to revenue in each country, with the cost of each fatality being fixed to that of the US

Of course no industry will be able to survive when the costs of fatalities alone reaches 17.1% of the respective revenue generated by the industry. Even in the case of China, costs as high as 0.67% of the annual revenue on loss of life is a fairly large amount. Given that the US has the least cost of fatality compared to revenue and the fewest number of fatalities per tonne of production, then it will be assumed that the cost of fatalities in the US when compared to revenue generated is an efficient and comparatively sustainable model. Retrospectively, this also means that US firms spend 0.04% of the cumulative revenue generated by the industry on training and skills development of miners. As such, if Iranian coal mining firms spend 0.04% of their total industry's revenue on training and skills development, then the death of each miner would cost US\$30,000 and in China it would cost US\$90,000. Thus, it is stipulated that in all probability, mining firms in China and Iran do not invest as much as the firms in the US on training, skills development and implementing health and safety measures.

Whatever the relevant cost will be in the case of China or Iran, there is no doubt that they will represent a significant amount for a given mining firm. This is more so the case if the plaintiff

succeeds in bringing their claim in the country of the headquarters of the parent mining company in question, as demonstrated in *Connelly v. RTZ* (1997a) and *Lubbe and Others v. Cape Plc.* (2000c). However, regardless of the amount of indirect investment a firm makes in training a given miner/employee, the more experienced and skilled said miner/employee is the more they add to the market value of the relevant mining corporation (Corrado et al., 2005). As such, it is of crucial importance to implement adequate safety measures in mines in order to avoid such costly losses. In this regard, the US Mining Safety and Health Administration's guidelines are seen as pioneering in the improvement of safety and the reduction of fatalities (Feng and Chen, 2013). The term 'cost' is used interchangeably to refer to the components of social costs to communities and the direct economic costs to firms. In both cases these *costs* will have a significant adverse impact on the sustainability agenda of firms involved.

6.3.2. Reputational Risk and Damage

Aside from obvious financial costs derived from lack of adherence to the component factors of social sustainability, there are also other types of damages, which though intangible, result in a direct impact on a firm's balance sheet. These are factors such as corporate reputation among consumers and suppliers and other stakeholders. Some of this reputational significance is translated into the value assigned to good will in the balance sheet. However, adverse corporate image (reputation) among consumers is visible in financial statements of a firm only as a causal effect in the context of, say, a reduction in cash flow, operating profits or equity.

The sustainability reporting framework of GRI has been examined earlier and in other parts throughout this thesis and requires no further introduction. However, a new framework, namely RepRisk has not been examined thus far, which helps in providing an insight into the reputation (and associated risk) of institutions in relation to environmental sustainability, community relations and corporate social responsibility.

RepRisk is a private organisation whose task is to quantify environmental, social and governance risks posed to firms and other such organisations (RepRisk, 2013a). It does so by gathering information on a daily basis from governmental agencies, online media, social media and other outlets, and subsequently feeding the data to an algorithm which categorises the theme of said data. The data is gathered in relation to 27 issues (see table 6) that fall under

specific environmental, social and governance headings (RepRisk, 2013d). By doing so, a report is made which contains the level of the risk posed to a given firm from their environmental footprint, community relations, employee relations, corporate governance and product portfolio related risks.

RepRisk evaluates the reputational risks posed to companies by taking account of international standards, such as the Universal Declaration of Human Rights, International Labour Organisation Conventions, the UN Convention Against Corruption, the Equator Principles, World Bank Group Performance Standards and Environmental, Health and Safety Guidelines, and the OECD Guidelines for Multinational Enterprises (RepRisk, 2013g). The components of Table 6 are made specifically in order to reflect the components of the United Nations Global Compact (UNGC). The UNGC is a guiding initiative for firms who wish to align their operations with the ten universally accepted principles in human rights, labour, environment and anti-corruption issues (UNGC, 2013).

Environmental Footprint	Community Relations	Employee Relations	Corporate Governance	Product-Portfolio Related Risks
Global Pollution and Climate Change	Human Rights Abuses, Corporate Complicity	Forced Labour	Corruption, Bribery, Extortion, Money Laundering	Controversial Products and Services
Local Pollution		Child Labour	Executive Compensation	
Impacts on Ecosystems and Landscapes	Impacts on Communities	Freedom of Association and Collective Bargaining	Misleading Communication, e.g. "Greenwashing"	
Overuse and Wasting of Resources	Local Participation Issues	Discrimination in Employment	Fraud	Products (Health and Environmental Issues)
Waste Issues	Social Discrimination	Health and Safety Issues	Tax Evasion	
Animal Mistreatment		Poor Employment Conditions	Anti-competitive Practices	
Violation of International Standards				
Violation of National Legislation				
Supply Chain (Environmental, Social, and Legal Issues)				

Table 6: Scope of criteria considered in the RepRisk framework (RepRisk, 2013g)

RepRisk assigns risk levels to an institution's reputation based on the criteria above. These risk categorisations are later translated into an index, namely RepRisk Index (RRI), which produces a quantitative risk measure taking account of the criticisms found within the report (RepRisk, 2013c). The index ranges from zero for least controversial companies to 100, for the most controversial companies. RepRisk Index is classified according to the following intervals:

- 0-25: low exposure
- 25-50: medium exposure
- 50-75: high exposure
- 75-100: very high exposure

In reality, only a very few firms have RRI of over 70. Thus, a firm with RRI of 50 is still considered to be highly exposed to risk. Following a personal communication with one of RepRisk's representatives, the Author has learnt that RRI of 100 has never been attributed to a company (RepRisk, 2013b). Furthermore, the highest RRI score ever assigned to an organisation was 91 in May 2008. This was assigned to the Sanlu Group (石家庄三鹿集团股份有限公司), a formerly popular producer of dairy products in China. The company received a judicial order for bankruptcy in December 2008 following a scandal which led to the death of 6 children and grave health complication to some 300,000 infants and children in China due to a contamination in the firm's products (Lilley, 2008). The second highest RRI score of 86 was given to Tokyo Electric Power Company (TEPCO) of Japan⁸⁴, following the Fukushima nuclear disaster in 2011.

6.3.3. Business Un-Sustainability

It is important to explore the adverse effects resulting from lack of sustainable corporate practises in the context of real industrial and market examples. As such, focus will turn to cases where lack of adherence to human rights has resulted in direct or indirect economic losses to companies.

⁸⁴ The nuclear power generation plant in Fukushima, Japan, which was struck by a strong earthquake and subsequent tsunami in 2011, belongs to TEPCO and is operated by the same.

Comparing the rate of mining fatalities in the US with those of China and Iran creates the perception that American and multinational firms adhere to the highest standards of social sustainability. That is likely the case for the mines operated by these firms in the US, given strict regulations pertaining to safety and health in mines. Whereas, this is certainly not the case for mines that they operate elsewhere in less developed countries, as evidenced by the history of human and labour rights abuses and environmental exploitations which are often synonymous with the term ‘mining industry’ – more will be explained through examples below.

The largest three mining firms also abide by the GRI reporting standards and often attract the highest application level grades (i.e. A+). However it is not sufficient that, firstly, these firms publish such reports to the extent that they are legally obliged to, and secondly, that they report according to the GRI standards (since reporting fully using the GRI standards is by no means to say that said firm conducts business according to sustainability principles). These arguments, namely, that firms should actively take steps which are expected by consumers and stakeholders beyond what is required by law or leading reporting bodies, form the basis of Chapter 7. They also have a history of human and labour rights abuses and environmental exploitations.

For example, BHP Billiton and Rio Tinto both feature in the list of top ten most controversial mining companies globally in 2011 (RepRisk, 2012). In 2011 BHP Billiton attracted much criticism from NGOs for alleged widespread environmental destruction and human rights abuses. Rio Tinto also attracted negative attention from NGOs in 2011 for alleged environmental mishandling and human rights abuses. Uranium mining has been among the most controversial activities of Rio Tinto, with NGOs claiming the company produces radioactive waste in Western Australia which is known to cause intergenerational sickness, while radioactive water is also in danger of spilling from the Ranger Uranium Mine into an Aboriginal community area and Kakadu’s World Heritage-listed wetlands. Furthermore in 2011, Rio Tinto was accused of not allowing for proper public consultation, a lack of transparency, failing to deal with waste properly, and health and safety issues regarding its workers in African countries (RepRisk, 2012). Both BHP Billiton and Rio Tinto were also

internationally recognised for their severe lack of transparency⁸⁵. As such, simply producing a report based on GRI indicators does not show that said company is sustainable.

Alpha Natural Resources Inc. was one of the most controversial mining firms globally in 2011 after the company acquired Massey Energy. Massey has been criticised for mountaintop removal mining, pollution, safety problems, poor employment, and fraud issues, as well as its role in the explosion of Upper Big Branch coal mine in April 2010 (RepRisk, 2012). Since that incident there have been more than 1,000 citations from the US Mining Safety and Health Administration. Furthermore, far from exercising a transparent reporting regime, the company was accused of hiding evidence on lack of adequate safety measures from the authorities. Alpha agreed to pay US\$210 million in order to settle relevant civil and criminal penalties arising thereof. Moreover, Massey's subsidiary companies were accused by residents of West Virginia for causing the spillage of 1.2 billion gallons of toxic slurry and thereby wide-spread contamination. Consequently, the companies set aside some US\$35 million in settlement fees (*Ibid*).

In terms of Environmental sustainability, in 2006 the Norwegian Finance minister excluded the Arizona-based international mining company, Freeport-McMoRan Copper & Gold Inc. from the Norwegian sovereign Oil Fund, a US\$240 billion governmental pension fund, for using a natural river system for tailings disposal. This was deemed to pose the risk of severe environmental damages which would later be attributable to the Fund. The value of this divestment was around US\$18 million (Ministry of Finance, 2006). Freeport was also accused of paying US\$14 million in bribes to local police forces in Papua New Guinea for masking its human rights abuses (RepRisk, 2012).

As the largest private sector employer operating on the global scale, the US-based international retail firm Wal-Mart's lack of adherence to the human rights of its employees attracted widespread criticism. These resulted in a social scandal for Wal-Mart in 2006, which in turn led to the withdrawal of a major institutional shareholder (Acher, 2006, Gogoi, 2007). The firm was found to have breached the human rights of its employees in the United

⁸⁵. The above list of allegations are all made by NGOs which who focus for the most part on environmental and human rights issues. It is noteworthy that business activities may transgress other types of sustainability indicators. In this context, it is noted that in cases where NGOs claim that a breach of human rights has occurred, said breach may for the main part be linked to labour rights or equity, and as such, may not be tantamount to a legal claim on the ground of human rights (solely or otherwise).

States by repeatedly assaulting them and forcing them to work overtime with minimum or no remuneration. There were also cases of physically locking up employees in the form of punishment (Ministry of Finance, 2006). Furthermore in 2007 the Human Rights Watch, an entity which usually looks for human rights abuses in countries as opposed to corporate firms, accused Wal-Mart of going into extreme lengths to prevent its employees from forming labour unions. As a result, the Norwegian Oil Fund (above) sold its stock holding in Wal-Mart worth some US\$430 million (at the end of 2005). The then Norwegian Finance Minister stated that “[Wal-Mart was] excluded because, in view of their practices, investing in them entails an unacceptable risk that the fund may be complicit in serious, systematic or gross violations of norms” (*Ibid*, Para. 2). This decision was reached in light of Wal-Mart’s business operations in the USA and Canada, and at its suppliers in Nicaragua, El Salvador, Honduras, Lesotho, Kenya, Uganda, Namibia, Malawi, Madagascar, Swaziland, Bangladesh, China and Indonesia.

Lack of transparency and sacrificing long-term economic prosperity in favour of short-term financial gains are both antonymous to the theory of business sustainability and indeed the spirit of GRI reporting frameworks⁸⁶. Notwithstanding this point, it will be shown later on that most of the firms highlighted above have attained the highest Application Level grade from GRI for their sustainability reports. This Chapter focuses on Rio Tinto, which has an A+ Application Level grade but is subjected to a vast array of public criticism in terms of corporate social responsibility and business sustainability. As evidenced from the recent examples above, in many cases where companies’ businesses have had detrimental effects on the environment and the health of their surrounding inhabitants, said firms have been found liable in the court of law and made to pay appropriate damages and fines. Corresponding reputational damage can be significant indeed and may become worse as the digital world shines its increasingly broad, laser-like light on the overseas activities of mining firms.

6.4. Rio Tinto

Rio Tinto, whose headquarter is in London, UK, was established in 1873 as The Zinc Corporation in New South Wales, Australia. The company is today one of the world’s best known mining companies, employing some 71,000 persons globally in 2012 (up from 68,000

⁸⁶ Transparency and Long-term corporate planning are dealt with in more detail in Chapter 7 where they are introduced as autonomous rules.

in 2011), with total assets worth US\$23.7 billion. The company employs 26,000 employees in Australia and New Zealand, 13,000 in Europe, 9,200 in Africa and 8,900 in Europe, *inter alia* (Rio Tinto, 2013). Rio Tinto supplies iron ore, coal, aluminium, copper, silver, gold, borates, and titanium dioxide, as a result of its global mining operations (MarketLine, 2012). The sheer size of the firm and the wide ranging geographical scope of its operations have helped increase employment in many countries and supported many related industries globally.

Over the years Rio Tinto has become one of the major players in product design and technological innovation, which have helped the advancement of the global mining industry (Hume, 2013a). In 2012, the group invested US\$129 million into research and development. Moreover, the company has invested some US\$100 million to date in research and development on technologies for the reduction of carbon emissions (Rio Tinto, 2013). However there is constant pressure from various stakeholders demanding that an increasing share of large industrial firms' revenues be invested in research and development aimed at carbon reduction measures (Sullivan, 2012).

Rio Tinto is in the top three largest mining companies globally, together with Vale and BHP Billiton. The company's earnings have been increasing on average during 2003-2011, totalling an annual average of US\$5.9 billion. In 2012, however, the company recorded a loss of earnings amounting to US\$3 billion, which was largely attributable to impairments of US\$14 billion of the company's Aluminium and Coal businesses (including Pacific Aluminium and coal mining in Mozambique) (Rio Tinto, 2013). This is the largest loss that Rio Tinto has ever recorded (Hume, 2013c).

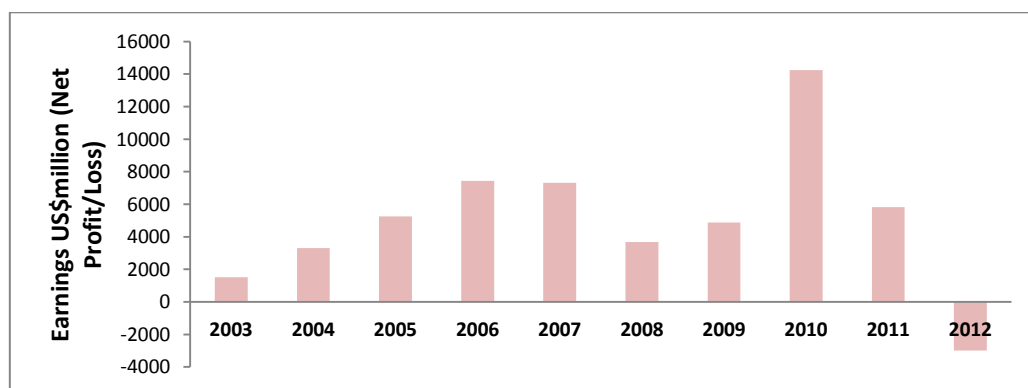


Figure 15: Rio Tinto Plc. Net Profit (Loss) for 2003 - 2012

Rio Tinto's financial statements for 2012 shows that the loss of earnings has been mainly due to a dramatic reduction of net earnings in the company's operations in the Aluminium and Energy (coal) sectors. To that end, total net earnings resulting from the firm's Aluminium business were US\$611 million and US\$442 million in 2010 and 2011 respectively, while in 2012 it reduced to US\$3 million. The same trend is seen in their energy sector (coal mining); net earnings in 2010 and 2011 stood at US\$1.2 billion and US\$1.1 billion, respectively, while it reduced to US\$280 million in 2012 (Rio Tinto, 2013).

The firm's shareholders' equity, however, has not been impacted as severely subsequent to a difference of US\$8.8 billion in net earnings between 2012 and 2011; the size of the fund has been reduced by US\$5.6 billion. The value of the firm's total assets has only decreased by US\$1.9 billion from 2011 to 2012⁸⁷ (*Ibid*).

'Gross Sales Revenue' shows the accumulated income derived from sales of said products and does not take into account any sales taxes, goodwill adjustments, inventory adjustments, discounts and most importantly, product impairments. Therefore, it is helpful to examine Rio Tinto's gross revenues for 2012, in order to understand the allocation of revenue generation in relation to operation segments within Rio Tinto.

The company's largest operational division is iron ore production where the firm reported gross sales revenue of US\$24.3 billion in 2012 (reduced from US\$29.5 billion in 2011). The second largest operational arm of Rio Tinto is dedicated to Aluminium production, where the firm reported US\$10.1 billion of gross sales revenue in 2012, which has decreased by 17% compared to 2011 (*Ibid*).

The sizeable loss which Rio Tinto reported in 2012 was due to two significant events in 2012, which lead to writing off nearly US\$14 billion of the firm's operations. In Aluminium production, it became clear that Alcan, which was acquired in 2007 at the peak of the market was significantly over priced (Hill, 2013).

Similarly, the amount of coal reserves and their quality in Riversdale Mining, which Rio Tinto acquired in 2011 in Mozambique, were overestimated, particularly *vis-à-vis*

⁸⁷ From US\$119.5 billion to US\$117.6 billion.

metallurgical coal, which is used in the production of steel. This eventually led to 75% of the Riversdale Mining being written off in late 2012 (Hume, 2013b). Business in Mozambique has further proved challenging for Rio Tinto due to lack of adequate infrastructure, which is necessary for exporting coal from Mozambique. Before acquiring Riversdale Mining, Rio Tinto had planned to use the Zambezi River to transport coal from the mine to Beira port in central Mozambique. The firm also relied on a joint venture with state-owned contractors to build 600 kilometres of rail and road links from the mine to said port (Green, 2013). Both of these plans fell through: the former due to heavy opposition from environmental groups and subsequently the government, and the latter due to lack of funds. A joint operation between Rio Tinto and Vale has been sought for solving this issue (Hume, 2013b).

The complication of this scenario is a vivid example of the interdependence of the components of the triple bottom line theory. In terms of Economic Sustainability, the financial performance of the group has been undermined severely due to inaccurate business judgements (overestimation of coal reserves). In terms of Social Sustainability, local pressure groups and NGOs had lobbied the government of Mozambique to halt plans to transport coal through Zambezi River, which falls into the Environmental Sustainability pillar. This subsection will aim to examine Rio Tinto's sustainability strategies in light of the triple bottom line framework.

6.4.1. Rio Tinto and Social Sustainability

The term 'sustainability' denotes a long term view of any given process. For corporations, in essence, it is a business strategy in order to ensure the viability of a given business operation. This will entail a non-exhaustive list of factors, which, depending on the relevant industry or sector will bring certain common themes to the forefront of a long term business plan. One of the main aspects of Business Sustainability is reporting the risks posed to the company's business operations in the foreseeable future and in the longer term. This is in order to maintain a level of engagement with institutional shareholders and other key stakeholders. These two groups are of utmost importance to said firm, the former in relation to a steady capital flow and financial maintenance, and the latter for daily operations. For instance, there is clear evidence that shareholders demand that mining companies show more spending discipline amid an uncertain outlook for commodities (Hume, 2013b).

Institutional investors have also began exerting pressure on firms to invest with due diligence in relation to the risks to said business operation arising from environmental effects and changes in environmental law (see Chapter 3). There are many recent instances where firms are targeted with costly litigations invoking environmental law. For example, in August 2012, environmental NGOs and Utah residents launched a class action to sue Rio Tinto's subsidiary, Kennecott Copper, for alleged violations of the Clean Air Act at the company's Bingham Canyon Copper Mine (largest open pit copper mine globally). The plaintiffs claim that Rio Tinto's operations have breached an earlier license limit since at least 2006, contributing to severe air pollution in the area and leading to the premature death of up to 2,000 Utah residents annually (Choyt, 2012).

However, there is also evidence of good practice by Rio Tinto in relation to the same mine. The Kennecott Mine management team predicted a wall slide in Bingham Canyon mine and ceased all mining operations in preparation for the slide. To that end, the mine management team announced on 10 April 2013 that they have restricted access to areas of concern for staff and relocated employees to other areas within the mine; relocated utilities, buildings, roads and heavy machinery to reduce the impact of the slide on operations and maintain long-term productivity in areas not impacted by the slide; and maintained communication with employees and community stakeholders to share information about proactive contingency planning measures (Rio Tinto Kennecott, 2013a). The wall slide occurred on 10 April 2013 at 21:30 and was more severe than what had been anticipated (Scovazzo, 2013, Troszkiewicz, 2013). It is somewhat remarkable that one of the largest landslides ever recorded, occurring at the globally largest open pit copper mine, resulted in no fatalities with minimal damage to equipment and properties (Scovazzo, 2013). This is all due to the extent of detailed monitoring of the ground and walls on a daily basis (Rio Tinto Kennecott, 2013b). The slide led to the loss of production equivalent to 100,000 metric tonnes of copper, which would reduce the firm's annual production forecast by 33% (Behrmann, 2013).

Notwithstanding the recent achievement of Rio Tinto in containing the wall slide in Kennecott, the firm remains to be faced with numerous accusations and criticisms. The vast majority of such criticism stems from the adverse effects of the firm's operation on the environment, lack of adherence to human rights and abusive employment standards (i.e. all issues which fit within social sustainability). For example, much of the coal mines for the Riversdale development project in Mozambique (above) were found to be beneath the city of

Tete, on both sides of the Zambezi River. In order to exploit these mines, Rio Tinto (alongside Vale) offered financial compensation to the residents of Tete and the surrounding villages in return for their displacement. Allegedly, however, the vast majority of the residents have received no compensation whatsoever, and have been resettled in some of the least fertile grounds in the area, where no agricultural activities are possible (Mueller, 2012, IndustriALL Global Union, 2012).

In *Sarei v. Rio Tinto* (2013b), the company was accused of involvement with the government of Papua New Guinea in the genocide of some 15,000 people in 1988. The case was filed in 2000 and in April 2013 was referred back to the Ninth Circuit by the US Supreme Court for further consideration in light of the decision in the *Kiobel* case (above). The Ninth Circuit reaffirmed its earlier judgement in June 2013.

In 2011, Rio Tinto Alcan was fined AUD 160,000 in Australia, for a spillage of 62,000 litters of unleaded petrol at its Gove site in 2010. The spillage resulted in the contamination of soil and groundwater in Arnhem. Rio Tinto has stated that containing and cleaning the affected area has cost AUD 3 million (Morgan, 2011). In 2009, Rio Tinto was heavily criticised for the lack of environmental management in the Grasberg gold mine in Papua New Guinea for releasing 125,000 tonnes of toxic waste into the Jaya River on a daily basis (Kumah, 2006).

In another example, influential labour groups and NGOs accused Rio Tinto (and other firms) of destroying Latin American indigenous communities through forced displacements, killings, intimidation, bribery, destruction of ecosystems and water pollution (Valer, 2012). Bribery is a charge to which Rio Tinto has been accused on numerous occasions. In one of the most serious cases, two executives in China were imprisoned due to their involvement with bribery and industrial espionage in which Rio Tinto was seen as an accomplice (Sainsbury, 2010).

In terms of environmental mismanagement, Rio Tinto has been subjected to criticism pertaining to lack of adequate environmental and social impact assessment prior to the commencement of mining operations in their Oyu Tologoi mine in Mongolia. The Oyu Tologoi project has devastated much of the environment surrounding the mines and forced local herders to flee to cities in anticipation of environmental devastation; a new phenomenon called “environmental refugees” (Economist, 2012, Sheppard, 2012).

In March 2013, a new legal proceeding was launched against Rio Tinto in Canada (alongside Iron Ore Company of Canada), whose plaintiffs claimed that the company(ies) had not included the indigenous communities in the decision-making process and profit-sharing in their operations in Lac Sait-Jean area of Quebec. The case, which is in relation to the firm's mining operations in 1950s, demands a compensation of CAD\$900 million (Halley, 2013, Reuters, 2013).

Upon a close examination of a vast number of reports, it has become somewhat clear that, in terms of corporate social responsibility, Rio Tinto's brand name is often associated with environmental mismanagement and contamination alongside human rights abuses. This grim perspective of the firm is not limited to individuals or environmental NGOs, but also includes institutional investors. For example, the Norwegian sovereign Pension Fund in 2008, decided to excluded Rio Tinto from its investment portfolio for contributing to severe environmental damage through its cooperation with Freeport-McMoran Copper & Gold Inc. in the Grasberg mine in Indonesia (Ministry of Finance, 2008).

The most effective method for cultivating the loyalty of institutional shareholders and other key stakeholders is by producing transparent and candid accounts of the company's operations. Traditionally, this has been done through said firms' Annual Reports, which must comply with certain accounting standards. However, there is little argument that such accounting standards lack sufficient rigor pertaining to their requirements on environmental reporting (see discussion in Chapter 3).

6.5. Efficacy of Sustainability Reporting Frameworks

6.5.1. RepRisk

Rio Tinto's RepRisk Index was 40 (medium risk) on 15 April 2013, and had increased to 47 on 23 April 2013 (medium-to-high risk) (RepRisk, 2013e, RepRisk, 2013f). Such a sharp increase in a matter of nine days clearly demonstrates the volatility of risk and criticism aimed at Rio Tinto, which is directly attributable to the firm's social and environmental sustainability. Figures 16 and 17 represent the RepRisk Index for Rio Tinto and Veolia Environnement respectively, and have been provided by way of comparison.

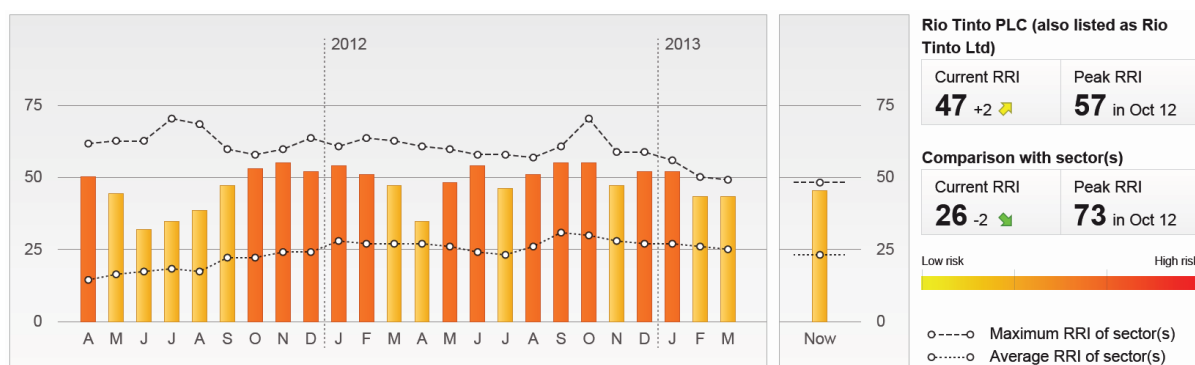


Figure 16: RepRisk Index trend for Rio Tinto Plc., as of 24 April 2013 (RepRisk, 2013f)

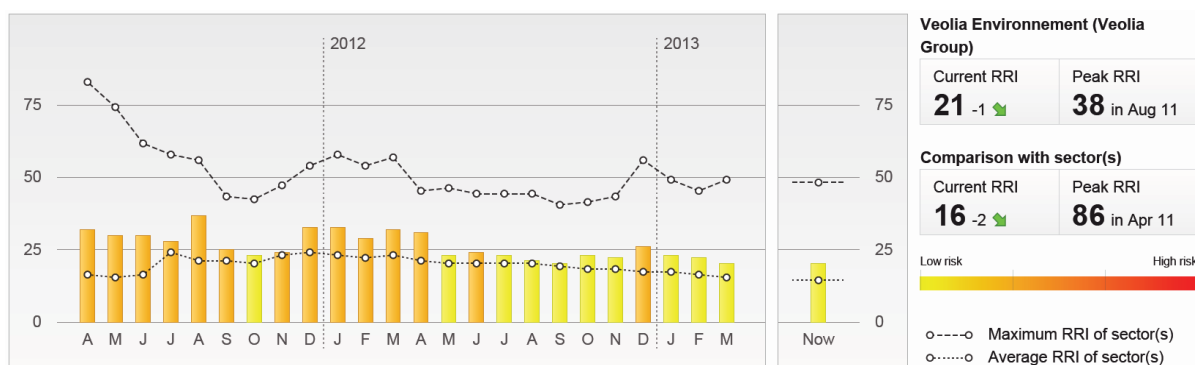


Figure 17: RepRisk Index trend for Veolia Environnement, as of 24 April 2013 (RepRisk, 2013h)

The peak risk for Rio Tinto during the past two years has been 57 in November 2011, while the peak RRI for the mining industry as a whole was 73 in October 2012. However, the current average RRI for the industry is 26, which is significantly lower than Rio Tinto's current RRI. In light of the preceding paragraphs in relation to Rio Tinto's environmental mismanagements, perhaps it is not surprising that the firm's RRI is so high.

There is clearly merit for the high level of risk attributed to Rio Tinto, which is partly derived from the selective examples provided above. However, this is not to say that sustainability reporting entities such as RepRisk or GRI provide an accurate and comprehensive image of a firm's sustainability efforts, which would be

There are marked disadvantages associated with solely relying on RepRisk for a comprehensive account of risk exposure to a firm. One such disadvantage of using RRI is that the news and information gathered could include observation bias from disgruntled stakeholders or simply based on inaccurate information. There are many reports by environmental pressure groups which have been included in the RRI framework. Though,

upon closer examination of a handful of the original reports, one tends to find a lack of intellectual substance or comprehensive evidence for claims against Rio Tinto. However, RepRisk has attempted to mitigate for such circumstances by allowing observation for repeated criticisms. As such, if one claim is echoed by several different entities then it is likely that said claim is based on hard evidence and thus not biased. It is close to impossible for RepRisk to institutionally examine every single entry for its validity and objectivity.

RepRisk reports tend to provide insight into reputational damages to a firm's brand perception (or even brand equity). Furthermore, they do not provide any insight into the internal mechanisms of a firm, which may lead to an inappropriate acquisition or environmental mismanagement. As such, the quantified risk that the RRI produces is not so much a measure of the risk posed in the future, but more of a measure of the extent of damage to a firm's brand, as a result of the firm's own activities. For example, in October 2012, Rio Tinto's RRI reached around 55, which is considered a high risk exposure, as shown in Figure 16. In October 2011 Rio Tinto attracted 8 criticisms, of which 3 were classified as 'harsh' – in RepRisk, harsh criticisms have a significant effect on a firm's exposure to risk. In response to said criticisms, the RRI index in October 2011 reached 55. If the increasing number of criticism received in relation to Rio Tinto has a correlation to said firm's exposure to risk, then this risk should be reflected in the RRI of the following month. Whereas in November 2011 it is shown that the RRI for Rio Tinto has fallen back to around 48.

On the other hand, an investor who is interested in returns on their investment (be it in the short run or long run) would not be able to rely on RepRisk's RRI as an appropriate measurement of the risk to which Rio Tinto had been exposed in late 2012. In late 2012 Rio Tinto wrote off US\$14 billion of their operations in Aluminium and Coal divisions, resulting in the firm's biggest ever net loss (US\$3 billion for 2012). This, of course is unwelcome news for an investor, unless if said investor is hoping to benefit from conciliatory rises in dividend payments. It is clear in hindsight that a firm whose operations have been reduced by US\$14 billion had been exposed to extraordinarily high risk levels prior to the event. Notwithstanding, this risk had not been highlighted by RepRisk due to two main reasons: firstly that RepRisk monitors reputational risks mainly in relation to the components of United Nations Global Compact, which does not take into account financial mismanagement and lack of business acumen; and secondly that there is no way for any external auditing or

reporting body to gain access and expose imminent risks posed to a firm, by examining all layers of management and directorship to search for possible lack of due diligence.

It is, therefore, stipulated that the RepRisk framework should be extended in order to contain a dimension for the financial well-being of firms. This can simply take into account the market outlook for the firm's main products and services. This will provide a truly progressive risk measurement tool while taking account of the criticism of the firm's performance in environmental and social management. For example, as stated above, the largest operational division of Rio Tinto is dedicated to its iron ore production, resulting in gross revenue of US\$24.3 billion in 2012. However, there is growing pessimism about the prospects of a stable market for iron ore in the foreseeable future. It has been suggested that the growing volatility in the commodities market will affect the price for iron ore directly and thus result in a much less profitable business division in the long run (CNBC, 2013).

6.5.2. Global Reporting Initiative

The GRI sustainability reporting framework aims to provide a "balanced and reasonable representation" of the sustainability performance of a reporting organisation (GRI, 2011c). Clearly this entails that both positive and negative factors will be implemented. However, in absence of a regulatory framework for the adequate extent of disclosure pertaining to sustainability information, reporting firms will choose the areas in which they wish to report. This aspect of the GRI framework, together with the problems with lack of regulating in this area of business operation has been discussed in detail in Chapter 3. Other academics have conducted research about the shortcomings of the current reporting frameworks and particularly that produced by GRI (Veleva and Ellenbecker, 2000, Salzmann et al., 2005).

Rio Tinto is also one of the firms which use the GRI standards. The company's sustainability report obtained the highest Application Level rating, namely A+ in 2011 (GRI, 2012). The Application Level of A+ denotes that all of the GRI criteria have been reported on, the management approach has been disclosed for each indicator category, the full requirements pertaining to Performance Indicators & Sector Supplement Performance Indicators have been adhered to, and finally that all the elements of said report have been extremely assured (audited) by an external entity (GRI, 2011a). *Prima facie*, therefore, it seems that Rio Tinto abides by a comprehensive reporting standard at the heart of which is the promotion of sustainable business and development.

It is helpful to examine the record of another equally large and influential business-to-business firm in order to gain an insight into the image painted by GRI of Rio Tinto. Firm A also uses the GRI framework for its sustainability reports. It is long demonstrated that Firm A is a pioneering firm in the provision of sustainable water and waste management technologies in industrial and municipal scales, and has been subjected to minimal criticism in terms of environmental sustainability. Nevertheless, the Firm A achieved Application level of B+, since the categories which it fulfilled of GRI's framework was not satisfactorily conclusive for a higher grade. This indicates that the company reports on most, but not all of the principles required by GRI for an A+ Application Level rating. In a GRI rating comparison between Rio Tinto and Firm A, one can perhaps convincingly insinuate that Rio Tinto is more environmentally sustainable⁸⁸ (or responsible). For instance, Rio Tinto might not choose to report on incidents such as its 2010 spillage of 62,000 liters of unleaded petrol, while still attaining an A+ rating (Morgan, 2011). On the other hand, Firm A which achieved the B+ rating has caused only minor environmental damages in the past five years.

The publication of sustainability reports is of vital importance to institutional shareholders and other stakeholders of a firm, since the purpose of such reports is to clearly demonstrate the risks that a company faces in light of their business operation. Thus, it is true that abiding by a sustainability reporting standard, such as the GRI, increases transparency within the firm. Though, this is not to say that said company is successful in balancing the relevant triple bottom line of its business, or that the business is less risky as a result of declaring such risks.

6.5.3. Greenwash by Virtue of Reporting Standards

Following the critique of GRI above, it has become clear that the nature of this reporting framework inherently allows "greenwashing strategies" by companies. Accession to GRI is voluntary and so is the amount of disclosure firms wish to make. Following the GRI's standard fully does not necessarily mean that a company is environmentally, socially or economically sustainable. One needs not look further than the A+ grade given to Rio Tinto's sustainability. Whereas, Rio Tinto has been severely criticised time and again in relation to greenwashing activities (OneWorld, 2012). For example, in June 2012 the internationally active NGO, Friends of the Earth, published a report which heavily criticised the widespread

⁸⁸ Note that all the sustainability goals have been chosen by Rio Tinto, and the company only used GRI's framework.

involvement of multinational corporations within different tiers of the United Nations. The report claimed that these firms are highly active in greenwashing, which is legitimised when it is purported to benefit from the support of the United Nations (Friends of the Earth, 2012). One of the firms criticised in this report is Rio Tinto.

6.6. Conclusions

One of the conclusions that the reader will have reached by this stage is that the environmental and social sustainability pillars are deeply interdependent, as demonstrated from the examples above. In this regard, where environmental NGOs and social justice NGOs seek to highlight their concerns without taking a multi-pillar approach one pillar may pre-emanate over another. Hence, if an environmental concern is treated as pre-eminent then stakeholders (employees and the local community) with equal or superior social concerns may be lost in the discourse. This is why it is beneficial for all stakeholders to observe a three pillar approach in sustainability problem-solving matters.

One of the most important intangible assets of firms is the skills, knowledge and know-how encapsulated within the firm's employees. At the same time, the area of concern within the concept of social sustainability is that of "*people*" and how they are affected by the operations of the organisation. These *people* could be both internal and external to the firm. Internally, the Chapter has examined the importance of human capital to the operations of the firm involved in the context of the mining industry. Furthermore it is demonstrated that a lax approach to the observance of human rights or labour rights (in the context of safe and equitable working conditions) will eventually lead to financially unsound circumstances for the culpable firm. The Chapter further concludes that business activities which are against the spirit of sustainability and its inherent rules leave the firm in a disadvantageous situation in relation to its external stakeholders. Many examples have been reviewed where business operations of Rio Tinto have adversely affected communities and the environment.

The area of human capital as an integral part of social sustainability is one which has attracted little academic research. Given the importance of this aspect of social sustainability for firms, it is submitted that it should form part of future research activity. For example, much analysis is required in the monetisation the value attached to human capital; among

other criteria, this may depend upon an employee's level of expertise, education, skills, experience and may differ from one industry to another.

It is also demonstrated that there is a possibility that firms would utilise the inherent loopholes within the framework used by GRI and RepRisk. It has been demonstrated that a firm does not necessarily conduct their business operations according to the principles of social sustainability, simply by virtue of their A+ application level grade provided by GRI.

It is noted that this Chapter identifies a number of key social sustainability rules including the provision of an understanding of the adverse consequences (to the firm involved and to its stakeholders) when they are not developed and implemented in the mining sector. The examples in this and previous Chapters have been used to draw the Rules presented in Chapter 7. These rules mostly result from the case studies conducted above and follow detailed explanation and examples as to how they may be implemented. For example, rules 4.1, 4.3, 4.5 and 4.7 have been a direct result of this Chapter, whilst the remaining rules are found in more general circumstances. As with all the rules in other areas of focus in Chapter 7, these rules are deemed widely applicable to industrial actors other than those in the mining sector.

7

A RULE-BASED SYSTEM

Chapter 7: Analysis and Discussion

7.1. Introduction

Based on the vast array of literature read and analysed for the completion of this research project, it is understood that the concept of *sustainability* is, essentially, a series of criteria and methods of evaluation or comparison (i.e. metrics), which together aim to assess whether a firm's growth is sustainable within its environmental constraints (Hutchins and Sutherland, 2008). Therefore, supposedly, attending to a number of criteria and metrics will result in a firm being labelled a sustainable company. As stated in the introductory Chapter of this thesis, it is noted that there is a clear distinction to be drawn between sustainability and sustainable development: the former term being thought of as the ultimate aim for a corporation, and the latter being the means through which firms may achieve this objective (Schaltegger and Burritt, 2006).

The main concern in this respect is that there is no complete list of criteria for placing a company in the path of sustainable development, and the criteria which exist are not suitable for all types of business enterprises. As such, while there are a number of criteria which seem to be sufficiently flexible to meet the requirements of most business types, it is not true that following these criteria will necessarily lead to a *sustainable* business model. This is perhaps due to the inherent problems within the current corporate sustainability frameworks such as the GRI and ISO. Problems with these frameworks have been explained below in more detail.

A further issue with adhering to sustainability criteria is that they are mostly not required by law. In fact, once an activity such as recycling or containment of hazardous waste is drafted into law, market intermediaries and sustainability experts cease to view these acts as sustainability measures. It follows that firms which abide by a set of sustainability rules take steps beyond mere legal compliance. Concurrently, however, in the absence of laws and regulations the extent of sustainable business activities and corporate social responsibility becomes vague. As such it becomes clear that the concept of *sustainability* suffers from the single strongest weakness and / or critique that it defies explanation or a comprehensive definition. What constitutes *sustainability* cannot be intellectually defined within the realm of human knowledge. If so, a question arises about the way in which this concept is understood. It follows that understanding the concept of *sustainability* requires a rules-based system embedded within a continuing process, which will help understand sustainability in relation to the current challenges and requirements.

Both of these factors, namely a rules-based system and a continuous process, are essential. Due to the long run-oriented nature of the concept of sustainability, the rules embedded within the system should be flexible and changeable depending on the requirements of different markets and the applicable law. Furthermore this system has to be taken as a process of implementation and improvements (to the rules) in order to pave the way towards sustainability of a firm. Incorporating such a vision within corporate strategies, it seems will qualify the relevant business entity to claim that is following a path of sustainable development. Furthermore, implementing sustainability measures will improve the prospects of said firm's long term sustainability and improve selling opportunities, whilst creating a first mover advantage pertaining to regulatory compliance. Therefore, it is important that the notion behind sustainability rules takes a step beyond legislation and mere legal compliance; this should be done to the extent that not only certain business requirements have to be

fulfilled and laws adhered to, but also to be done in, for example, a transparent and engaging way without damaging the environment or human health.

Law constitutes of a series of rules pertaining to acts or omissions with the aim of imposing a duty, or a penalty as a result of the breach of said duty. As such, sustainability measurements which have been enacted into law follow the same trend in terms of financial penalties subsequent to a breach of duty – for example see duties pertaining to the containment of hazardous waste. In order to implement legal standards on, say, emission standards (air quality), there is often no absolute legal requirement for corporate transparency or stakeholder engagement (except for when required by law); the only requirement is the correct implementation and operation of certain machinery. However, since the concept of sustainability is in line with taking steps beyond legal compliance, the question arises as to whether it is possible to establish rules pertaining to corporate sustainability. The answer to this question, based on the learning from preceding case studies and the questionnaire responses from industry experts, seems to be positive. Beyond a few fixed criteria, sustainability rules are consistent with the ideas of transparent and consensual procedures, processes based on continuous improvement, and a suitable governance structure.

It has been learnt from many conversations with industry experts and firms throughout the process of this PhD project that firms often struggle in drawing up a business sustainability strategy. It has been cited that this is often due to the lack of a structured framework which would outline a set of basic requirements for businesses to implement as a blueprint (Jones, 2013). In many respects, the same problem exists when regulatory bodies begin drafting a legislation which seeks to create a regulatory framework for the first time – an example of such a scenario can be seen during the drafting process of a new EU Directive on Climate Change Adaptation about the technical content of said Directive. Aside from the content of Directives, which should in principle be based upon the opinion of expert stakeholders, rigorous academic research and industrial consultation, the rest of the Directive, namely the way in which it is reported in the Official Journal and entry into force are standard and based on the Lisbon Treaty (2007c), which itself is an example of a rule-based system.

It is important to recognise that such a framework of rules should only be available as a guiding note rather than a strict rule. Thus, both regulators and firms should be aware of these guiding principles, but may decide in good faith that a number of the rules therein are not

applicable to said entity or that they are better substituted with more specific rules. For example, the rules pertaining to environmental sustainability in this Chapter focus on water quality, volume and scarcity; these factors could be almost irrelevant to a cement plant which is positioned far from water sources; this plant should focus on emissions reduction and a good air output quality. Other firms, such as those in Oil and Gas industries should focus on many environmental aspects concurrently.

If it is accepted that there is a trend towards the institutionalisation of sustainability and, thus, related rule-based systems then it is appropriate to draw a distinction between said framework and value-based systems. It is understood that value-based systems can develop into rule-based systems in order to facilitate the achievements of the values associated with a certain group of entities. An example of such a transition is seen in the behaviour of organisations whose creation is rooted in the values of the persons who join together to achieve a common goal. This is the case with Non-governmental Organisations (NGOs). The relationship between corporations and NGOs has changed somewhat around the concept of stakeholder involvement since the early 1990s (Damlamian, 2006). To that end, NGOs began cooperating with firms in order to reach a common goal rather than seeking to do so by opposing business interests. By analogy, large and multinational firms (which are often leaders of a certain trend on an industrial scale) also began viewing such stakeholders as partners in problem solving rather than as opponents of their business activity. These new trends reflected an effort to move from a value-based to a rule-based system of corporate sustainability as NGOs even became involved in strategy making, as was the case in the collaboration between the World Wide Fund for Nature and Unilever in the creation of the Marine Stewardship Council's sustainable fisheries programme.

The author understands that changes such as these represent positive developments since they ensure greater transparency and commitment to environmental sustainability in the sense that rules will be provided and will presumably be enforced. Taking account of the behavioural changes of said groups, perhaps, a gradual acceptance of the following rule-based systems for environmental sustainability can be inferred.

7.1.1. Rationale for the Rules

It is recognised that a new rules-based system will need to respond to a number of concerns in order to be fully comprehensive. These are as follows:

1. Which firms are expected to implement these rules?
2. Why are these rules required?
3. What is lacking within current organisation-led rules-based frameworks?

These questions will be addressed respectively.

7.1.1.1. Which firms are expected to implement these rules?

It was stated in the Introduction Chapter that large and multinational firms are the focus of this PhD research. This is due to the effect of their business operations on the environment and health of their immediate communities, which are deemed to be much greater than those of small or medium sized firms. Also, it is understood that implementing sustainability measures entails extra costs, which large firms are best positioned to internalise in relation to the benefits gained thereof. Therefore it is deemed most feasible that these rules should be implemented by large firms at first. Upon their successful application, the framework could be rolled out to medium sized firms and then to small firms⁸⁹. It is important that small and medium sized firms also adopt these strategies as they generally comprise the larger proportion of the economy compared to large and multinational firms. Ideally, it is important that the scheme is implemented correctly and successfully in the first phase of implementation by large and multinational firms in consideration both of their (on average) superior resources and the larger reputational risk that attends their market reach.

A phased roll-out of environmental frameworks according to the size of corporations finds precedent in the implementation of the European Union's Emissions Trading Scheme (EU ETS), and the following schemes implemented on a national level by Member States. The EU ETS is the cornerstone of EU's drive for combating climate change through the reduction of man-made GHG emissions (European Commission, 2013b). The scheme works by implementing a cap and trade system, namely where a limit is placed on the overall emissions from high-emitting industry sectors, which is reduced each year (*Ibid*). Participation in EU ETS is mandatory for actors in the following industry sectors:

⁸⁹ It is likely that the classification of firm sizes according to the the European Commission in *Working Document SEC (2009) 1350 final* would not be sufficient for this purpose (see Footnote 1). If so, then a new categorisation would be devised to separate large-to-medium sized firms from medium sized firms, and medium-to-small firms. The EU ETS and UK CRC provide an example as to how these classifications could be created.

-
- Carbon Dioxide (CO₂) from
 - Power and heat generation
 - Energy-intensive industry sectors including oil refineries, steel works and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids and bulk organic chemicals
 - Commercial aviation
 - Nitrous oxide (N₂O) from production of nitric, adipic, glyoxal and glyoxlic acids
 - Perfluorocarbons (PFCs) from aluminium production (*Ibid*).

Industrial actors involved are some of the highest CO₂ emitters in the EU, such that 45% of the EU emissions are covered (and limited) by the scheme (*Ibid*). The ETS covers 11,000 power stations and manufacturing plants in 27 EU Member States in addition to Croatia, Iceland, Liechtenstein and Norway; a thousand of said plants are in the UK (GOV.UK, 2013b).

Identifying firms within said industries clearly suggests that the EU ETS targets the highest emitters of GHGs, which entails these will be some of the largest firms globally. To that end, the UK has created its own system of reduction of GHGs, which is called the Carbon Reduction Commitment (also referred to as CRC). The CRC is a mandatory emissions trading scheme for large and medium-sized non-energy intensive organisations in the UK, such as supermarkets, water companies, banks, local authorities and all central government departments (Thompson, 2013, GOV.UK, 2013a). UK firms which participate in the EU ETS and those which are covered by the requirements of the Climate Change Act are exempt from the CRC requirements (Thompson, 2013). Ten per cent (10%) of the greenhouse gas emissions of the UK results from the operations of said firms (GOV.UK, 2013a). The latest revision to the scheme was produced in May 2013 and required participation of firms who utilise at least 6,000 MWh of electricity, measured by a settled half hourly meter per year (Statutory Instrument, 2013 Order No. 1119, Article 3 – officially CRC Energy Efficiency Scheme Order 2013).

The scheme runs in phases, where each phase is a specified time period within which an organisation that qualifies for that phase must participate in the scheme. Phase 1 is from 1 April 2010 to 31 March 2014, and Phase 2 is from 1 April 2014 to 31 March 2019 (Environment Agency, 2013a). Emission factors for Phase 2 will be set each year in line with

national GHG emissions factors and a separate emission factor will be set for self-supplied electricity (*Ibid*, p. 107). The scope for inclusion in Phase 2 is narrower than Phase 1, since in the relevant qualification year, only *settled half-hourly* meters are taken into account (Thompson, 2013).

The threshold of using at least 6,000 MWh during a qualification year has been used in order to identify medium and large firms, such that they will save enough on energy bills to offset the administrative costs of participating (Environment Agency, 2013c). In order to place this rate in perspective, the website of the UK Environment Agency has provided a hypothetical example that “100 computers running constantly 24 hours a day, for 273 years would equal 6,000 MWh” (Environment Agency, 2013b). However, it is thought that this is a poor example which does not enable contextualisation of the supply of 6,000 MWh of electricity.

Let us assume an alternative example in order to better contextualise this figure. The electricity production in June 2013 in the UK was 24,365,000 MWh⁹⁰, and in all of 2012 was 347,341,000 MWh⁹¹ (IEA, 2013). As such, each firm whose operations required 0.001% of the total UK production of electricity in 2012 would have met the CRC inclusion criteria. In terms of a non-hypothetical example, it follows that 6,000 MWh of electricity corresponds to a consumption capacity of 685 kW for a given entity (see text box below). An average-size cement production plant has the consumption capacity of 10,000 kW (10 MW) while an above average-size gypsum manufacturing plant has a consumption capacity of around 2,000 kW (2 MW) (Oraee, 2013). Thus, in terms of electricity consumption, 685 kW (or 6,000 MWh annually) is comparatively small in terms of the energy requirements of manufacturing firms.

An organisation with an annual supply of 6,000 MWh of electricity during a qualification year has a daily electricity consumption capacity of 685 kW. This is derived as follows:

Unit conversion:

$$6,000 \text{ MWh} \times 1,000 = 6,000,000 \text{ kWh}$$

Eliminating the element of time:

$$6,000,000 \text{ kWh} \div (24 \text{ hours} \times 365 \text{ days}) = 685 \text{ kW}$$

⁹⁰ Total supply, including imports and exports was 25,523,000 MWh.

⁹¹ Total supply, including imports and exports was 359,386,000 MWh.

The comparison and figures above were provided in order to show that different restrictions have been imposed on firms depending on the size of their operations (and emissions) in Europe in order to reduce the overall GHG emissions of the participating states. The highest GHG emitters are covered by the EU ETS, and in the UK, the second highest group of polluters are covered by the CRC scheme. The same system could be devised for rolling out the Rules in this Chapter. They can depend on many aspects such as the number of employees, activities in different geographical areas, impact on number of people in communities, or a combination of these.

Another example of imposing certain rules on firms depending on their size is found in the Malta Environment and Planning Act of 2010 (MEP Act). The Malta Environmental and Planning Authority (MEPA) has devised General Binding Rules (GBR) in order to “regulate *small scale enterprises* through a standard set of environmental conditions related to waste management, emissions to atmosphere, effluent discharges, and storage of materials and chemicals” (emphasis added) (MEPA, 2013). The MEPA imposes other regulations (such as permits) specifically for large-size organisations (*Ibid*). These have been developed subsequent to stakeholder consultations and regulate different sized firms according to their own respective industries (*Ibid*).

For example, in terms of the Hotels sector, GBRs apply if a hotel that has less than 400 beds, while said hotel should apply for a specific permit if it houses more than 400 beds (MEPA, 2009). By way of an example, one the rules pertaining to Hotels is that “liquid and hazardous wastes shall be stored in a labelled, closed container(s) within a designated and controlled storage area(s) prior to ultimate disposal. Wastes of different natures should not be mixed in the same container” (*Ibid*, Rule 2.3).

Examples have been provided to the effect that different set of rules apply to different organisations depending to the size of their operations (which corresponds to their direct and indirect GHG emissions). It is suggested that the Rules contained in this Chapter can also be rolled out by governmental ministries or departments in sectors which are overall financially prosperous (such as the oil and gas industry), and gradually impose them to those which are currently facing tough market conditions (such as the retail industry).

7.1.1.2. Why are these rules required?

The reasons why these rules are required were covered generally in the introductory statements above. There are three primary reasons for the existence of such rules.

Firstly, that it is widely acknowledged that despite the sophistication of current environmental regulations, many legal deficiencies remain in the international environmental law regime (Richardson, 2013). Furthermore, despite numerous UN Conventions and Conferences of the Parties on Climate Change, global GHG emissions are rising and so is the rate of use (and demand) of natural resources in unsustainable fashions.

According to the McKinsey report on resource utility, by 2020 soaring demand for a range of different resources will occur at a time when finding new resources of supply and extracting them will become increasingly challenging and expensive, notwithstanding technological improvements in the main resource sector (McKinsey Global Institute, 2011). As for global GHG emissions, the graph in figure 18 shows two scenarios: the rising scenario depicts the level of GHG emissions by 2050 if the current rate of emissions is continued; while the decreasing trend show the projected GHG emissions of an energy system consistent with an emissions trajectory that recent climate science research indicates would give an 80% chance of limiting average global temperature increase to 2°C (IEA, 2012).

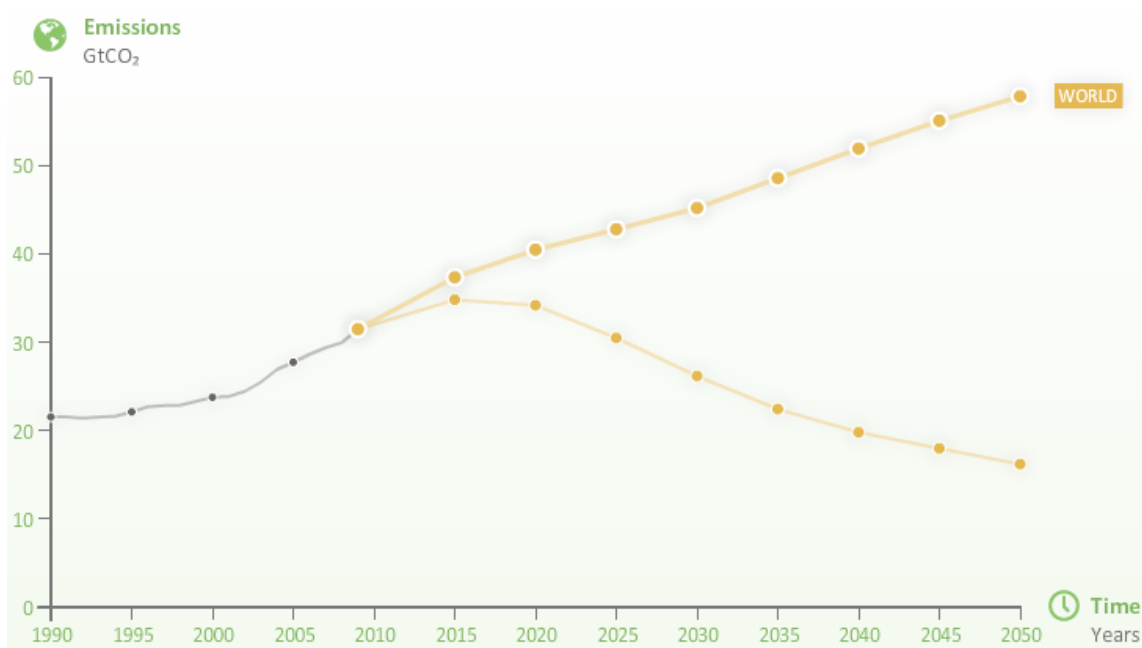


Figure 18: Two scenarios projected by the International Energy Agency pertaining to the future levels of GHG emissions (IEA, 2012)

In any case, however, both scenarios on the graph show that GHG emissions are due to increase by 2015, and have been increasing since 1990. Throughout this period, when CO₂ emissions have been continuously rising, states in the international arena have been attempting to reach an agreement pertaining to states' liabilities and commitments for future emissions reduction. This is a clear testament to the inefficacy of the current legal regime aimed at regulating emissions. The Rules provided in this Chapter aim to work alongside climate policies and new regulations in helping corporate firms and other organisations enshrine sustainability thinking into their long term organisational culture.

Secondly, in support of the above, a comprehensive set of rules pertaining to environmental protection is essential for long term global sustainability. These rules should be accompanied by sufficient supporting guidelines and adequate enforcement mechanisms. And lastly, as stated in the comments of the expert stakeholders surveyed for the validation of the findings of this thesis, and shown in Chapter 4 above, applying these rules could lead to competitive advantage for the firms involved (such as the mutual benefits to Firm B and Firm A).

7.1.1.3. What is lacking within current organisation-led rules-based frameworks?

Many firms produce guiding documents for the consumption of their directors and employees. The vast majority of these are internal to the firm, even in cases where they are produced externally. Examples of internal guiding documents include the results of Chapters 4 and 5 (for Firm A and Firm C), and for external documents include those produced by large consultancy firms such as McKinsey's Resource Revolution (referenced above). Internal guiding documents exist in the form of financial performance, or at most in relation to issues such as health and safety which are based on legal implementation.

It is difficult to find documents produced by firms which start from implementing changes to said firms' governance structure (from the board of directors) all the way down the hierarchal organisational ladder to the directors and employees.

7.1.2. Examples of Rules-Based Systems

Rules-based systems are not a completely novel means of achieving environmental or otherwise sustainability standards. For example, the International Organization for Standardization's ISO 14001:2004 sets a standard of environmental management, which is claimed to be the most recognised of its kind globally (ISO, 2013, BSI, 2013). The objective

of these standards is to “provide organizations with the elements of an effective environmental management system that can be integrated with other management requirements and help organizations achieve environmental and economic goals” (ISO, 2004). The series of rules under ISO 14000 include those pertaining to Environmental Management Systems, Eco Labelling, Life Cycle Assessment, Environmental Auditing, Environmental Performance Evaluation, and Environmental Aspects in Product Standards.

Thus, ISO produces guiding principles which are limited to only approving methodologies used in environmental services. The rules contained herewith in this Chapter differ from those produced by ISO in that they provide a comprehensive business sustainability strategy (guiding framework) and environmental standards are merely one constituent part of the whole set of rules. As such, in general terms, it is beneficial that firms would adopt the rules provided below as opposed to only relying on those in ISO 14001; since the former is all-encompassing and deals with all aspects of business sustainability instead of solely focusing on environmental management. On the other hand, the rules herewith are similar to ISO’s rules in that they both lack legal enforcement powers and are as such voluntarily acceded to.

Global Reporting Initiative also produces guiding documents for compliance with its own reporting criteria, and the method for producing corporate sustainability reports. The organisation has produced a vast number of guiding documents and multimedia files in order to help firms with drafting their reports. The reporting framework is based on five steps: prepare (consider what the firm’s sustainability report might contain in light of the firm’s major impacts), connect (identify key stakeholders and establish communication links), define (address internal and external areas of concern with management team based on stakeholder engagement), monitor (check processes and systems to ensure the quality of information and set performance goals) and finally, report (draft the report and communicate it) (GRI, 2013b). Firms should then refer to the main guiding documents, entitled Sustainability Reporting Guidelines (the current edition is G4) where the steps required for completing a sustainability report based on the GRI criteria are explained (GRI, 2013a).

GRI is the current market leader in providing corporate sustainability information to stakeholders. However, this framework does not state whether a firm is on a sustainable growing path. Instead, the GRI states to what extent subscribing firms have reported based on their corporate activities, where the reporting criteria contain factors in relation to

sustainability and the lack thereof. It follows that where *firm A* has reached the ultimate goal of a fully sustainable state but has not adequately reported on its activities will not be rated as sustainable by GRI. On the other hand, where *firm B* has reported to the full extent required by GRI but is in fact contributing to the depletion of natural resources more than its competitors will be granted the highest Application Level grade of A+. This has been demonstrated in Chapter 6 in the case of Rio Tinto and Firm A.

Other than standards set by market intermediaries and private organisations, the other set of rules are, *per se*, those found in law. Various regulations and thematic legislation have resulted from global climate change negotiations, though as explained above, there is limited progress, which entails the conclusion that legislation on its own is not effective.

There is also support in academia for such approaches to sustainability. For example, Dreyer et al. have created a framework which incorporates the impacts of products and services on people, specifically promoting human health, human dignity, and fulfilment of basic needs and seeks to become a corporate decision-making tool (Dreyer et al., 2006). The authors suggest a framework for social life cycle impact assessment methodology and present a method to define the issues for obligatory impact categories of Social life cycle assessment (LCA). Human dignity is defined and is used together with human rights as a base for evaluating social LCA. This framework lacks a comprehensive analysis of social sustainability, unlike the rules in the current Chapter, which cover a wider latitude of social aspects.

Building upon this work, Hutchins and Sutherland evaluate problems and methods which firms should consider as part of their social sustainability efforts (2008). Thus, they present a tool for integrating social sustainability into the business and the supply chain. They do so by reviewing “metrics, indicators, and frameworks of social impacts and initiatives relative to their ability to evaluate the social sustainability of supply chains” (*Ibid*). This provides a strong foundation for further research into the impacts of firms on social sustainability and for efforts in measuring such impacts. However at the current stage its scope is narrow and does not encompass issues which service-oriented firms have to resolve, as it is based on value-chain analysis.

Rules-based systems also exist in other areas of corporate decision making and compliance; rules pertaining to Health and Safety which have been explained below are a classic example of such systems. There are also other examples of internal compliance mechanisms which are published by regulatory bodies; and it seems that a trend is emerging for producing such guiding documents, as they are becoming a popular tool within firms (Scholes, 2013). For example, the International Chamber of Commerce, the UK's Office of Fair Trading, EU Commission's Director General for Competition and the US Department of Justice's Antitrust Division have all created guiding documents for compliance with competition (antitrust) rules within their respective jurisdictions (ICC, 2013, OFT, 2013, DG Competition, 2013, DOJ, 2013). These documents have been drafted for the internal consumption of firms. Upon examination of evidence of rules-based systems and their growing popularity, it becomes clear that rules-based systems are tools which are designed in order to increase the efficiency of a process in an organisation going forward (Scholes, 2013).

7.2. Expert Opinion

As stated in the Methodology Chapter, a questionnaire was designed and distributed to a small number of industry experts, whose main professional focus is on at least one aspect of corporate sustainability. Their response to this survey has been published in Appendix VII, but the identity of the respondents shall remain confidential. Respondents were all notified that they are expected to respond to the questions in their personal capacity (i.e. not taken as the overall view of the organisation they represent), and that they have been chosen because of their expertise in this field. The respondents were selected from Environmental NGOs, Corporations (business-to-business and business-to-consumer), Regulators (EU-wide, national and local), Academia, Consultancy firms, and current employees of firms for which sustainability is a market differentiator.

In the opinion of the majority (60%) of the expert respondents, firms consider the sustainability debate as a rules-based system. On the same question, comments from 20% of the stakeholders were tentatively positive, indicating that firms' corporate behaviour is highly dependent on the market in which they operate and as such this affects the way in which they view the sustainability debate. The remaining 20% of the respondents seemed to have misunderstood the question. One particular response (by an academic with considerable industrial experience) was particularly close to the findings of this project:

“I believe most firms treat CSR and sustainability as rule-based. However, I do believe that “rules” need to include normative expectations i.e. there may not be a legally enforceable rule that forces firms to report sustainability performance, but there are normative pressures from for example, NGOs (such as CDP) and pressure groups.”

Another particularly interesting response (by a management consultant focusing on resource economy) read as follows:

“Firms who see sustainability as a rule-based system tend to just be following the letter of the law or the current market demand for minimum criteria to be met – so reactive to external drivers. Firms who see sustainability as a new understanding of reality see it as a values-based system – do we want to be part of the future, if so, then we need to take care of our impact and be part of proactively creating new markets and new ways of meeting our needs through new ways of delivering value and addressing impacts.”

It is noteworthy that even if firms consider the sustainability agenda as a value-based system, implementation of those values would follow certain rules and procedures. Another respondent (high level manager within a multinational firm whose main source of competitiveness is its sustainable technologies and solutions) sought to differentiate between the ways in which firms in different business types approach this debate:

“It depends on the nature of the business and the firm’s sector. [Business-to-business] or [business-to-consumers] markets are for instance at a different level of maturity regarding this question. Hard regulation concerns more heavy industry where environmental impacts are huge. Generally speaking, the sustainability pressure is emerging from the downstream side of the value chain (final customers, users) and is going back on the chain up to the fields and mines (agriculture and heavy industry for 1st transformation). In the B2C sector, sustainability is seen as a differentiation factor from the competition”.

This is particularly true in the case of firms which are innovative in environmental technologies. During the research period leading to the drafting of Chapter 4, a senior director of Firm A stated on several occasions that sustainable technologies are a key market differentiator for said firm when tendering to municipalities and local governments (Clere, 2011). Firm A treats municipalities and local governments as customers, with the residents of

these municipalities as their end consumer (i.e. their indirect customers) (*Ibid*). The same is valid for business-to-business collaborations; the case study in Chapter 4 is a testament to this claim.

It has become somewhat clear that the industry experts who responded to the questionnaire agreed to some extent that sustainability is considered as constituent of rules, which are not interpreted to act as law and thus will be enforced by market forces rather than a regulator. To that end, a number of rules have been produced based on the research conducted in Chapters 3, 4, 5 and 6 above.

7.3. The Rules

In absence of units of measurement for corporate sustainability, it is important to fill the gap by at least producing “Rules”, which if followed, will help firms reach their supposed goal of conducting sustainable business operations. These rules will also be useful to legal drafters when enacting market regulations in relation to business sustainability. This subheading is dedicated to explaining the rules which have been derived from the research conducted in the preceding Chapters. These are in four categories, namely Corporate Governance, Environmental Sustainability, Economic Sustainability and Social Sustainability, and all together consist of 31 rules. A few of said rules have been directly derived from one of the case studies, as a result of which, they could be misinterpreted as industry-specific and inapplicable to other industries or sectors. Adequate explanation about the way in which these rules may be amended to fit other industrial actors will be provided in due course. Nevertheless, it is important to recognise that the rules outlined below are not sustainability indicators, but merely intend to facilitate sustainable business development.

The rules provided below can all be applied rather simply by firms and regulators alike. It is important to recognise that the four categories are all interdependent to some extent. For example, the Enhancement/Preventative principle (Rule 2.7) has been initiated from the Firm C and Firm A/Firm B case studies.

Corporate Governance	Environmental Sustainability	Economic Sustainability	Social Sustainability
1.1. s.172(1) Companies Act 2006	2.1. Incorporate WII	3.1. Climate Change Financial Risks	4.1. Human Rights Code of Practice
1.2. Transparency	2.2. Efficiency	3.2. Legal Application Framework	4.2. Training
1.3. Disclosure Rules and Procedures	2.3. Substitution Principle	3.3. Clarify Applicable Law	4.3. Indigenous Communities
1.4. Continuous Improvement	2.4. Scarcity and Manufacturing	3.4. Direct Dialogue	4.4. Supply Chain Management
1.5. Identify Risks	2.5. Water and Air Output Quality	3.5. Supremacy of Stringent Law	4.5. Effects in the Long Run
1.6. Self-regulation	2.6. Direct and Indirect Footprint	3.6. Culture of Sharing	4.6. Introduce and Utilise KPIs Objectively
1.7. Promote Knowledge Sharing	2.7. Preventative Principle		4.7. Protecting Source of Income
	2.8. Precautionary Principle		4.8. Community Engagement and Empowerment
	2.9. Sustainable Resource Management		4.9. Sustainability Education

Table 7: List of Rules, as derived from the case study research conducted in preceding Chapters

The explanation following the title of each Rule covers the following questions: what the rule is; environmental or other rationale (for example, environmental/governance/social); how and why this could be useful in a business context.

7.3.1. Corporate Governance

Corporate Governance can be viewed as a creation of law, as well as of scholarship pertaining to organisational studies and the theory of the firm. As such, it is naturally the case that it will be followed by a set of rules. In the UK, the Corporate Governance Code outlines these rules in the form of a code of good practice. The codes do not have any legal enforcement powers. One of the closest incidents that UK law has come to regulate Corporate Governance is within s.172 of Companies Act 2006. While the current rules are relatively comprehensive, one main criticism which can be attributed to them is that there is no focus on corporate sustainability or generally global sustainable development.

There are many market intermediaries and non-governmental organisations which have sought to fill the void created by lack of regulation. One such organisation is Ceres, which collaborates with more than 130 large organisations in a global network in order to accelerate and expand the adoption of sustainable business practices and solutions (Ceres, 2013b). As a leading organisation in this field, Ceres is unique in that particular emphasis is placed on the importance of the correct governance structure for implementing change within an organisation toward sustainability. The organisation has produced a three-tier sustainability mandate which comprises *Governance for Sustainability*, *Stakeholder Engagement*, and *Disclosure* (Ceres, 2013a). All of these three categories of actions are deemed to be part of a comprehensive Corporate Governance structure. It follows that the framework offered in this Chapter differs from that offered by Ceres in terms of its scope and latitude.

7.3.1.1. s. 172(1) Companies Act 2006 (Rule 1.1)

Section 172(1) Companies Act 2006 states that:

“A director of a company must act in the way he considers, in good faith, would be most likely to promote the success of the company for the benefit of its members as a whole, and in doing so have regard (amongst other matters) to—

- (a) the likely consequences of any decision in the long term,
- (b) the interests of the company’s employees,
- (c) the need to foster the company’s business relationships with suppliers, customers and others,
- (d) the impact of the company’s operations on the community and the environment,
- (e) the desirability of the company maintaining a reputation for high standards of business conduct, and
- (f) the need to act fairly as between members of the company.”

It is submitted, therefore, that s. 172(1) should form the basis of a Corporate Governance structure in firms. This section has been thought of as the first legal recognition of corporate social responsibility within English law, and is capable of being interpreted in a way which will help promote business sustainability (Copp, 2009).

As explained in Chapter 3, this section was included in legislation as a result of numerous calls for such measures in the White Paper preceding the Act and in the Operating and Financial Review (OFR). Nevertheless, it has been drafted broadly and thus does not present an arduous burden on firms during decision making. Learning from the four case studies conducted previously, it follows that firms will benefit greatly upon a voluntary adherence to s.172(1) and creating a bespoke framework for its implementation. It gave recognition to the enlightened shareholder principle which is embodied within s.172 (Ho, 2010).

The new company law regime in the UK requires the board of directors to justify their decisions in the context of stakeholder interests and to disclose material risks to said firm, which would impact stakeholders. Thus, this inherent rule has increased the accountability of company management by requiring cooperation from shareholders in making key decisions (*Ibid*). Nevertheless, as stated in Chapter 3 above, due to the way in which this section has been drafted its requirements are open to subjective interpretation by firms. Furthermore, the United States has not followed the same path toward regulating these aspects of corporate governance (*Ibid*); that is to say that even if the enlightened shareholder principle is seen as a serious requirement by firms in the UK, firms in the largest world economy are not subjected to them.

7.3.1.2. Transparency (Rule 1.2)

Transparency and open (and active) stakeholder engagement has been cited on numerous occasions in the literature as being one of the main elements of business sustainability. It is also a fundamental aspect of Corporate Governance, and has been emphasised time and again in the UK Corporate Governance Code⁹² (FRC, 2012). However this Code of Practice lacks an aspect of reporting which is increasingly important to institutional shareholders, which is environmental disclosure.

In a recent conference of mining academics and professionals, the transparency policy adopted by Rio Tinto in their recently collapsed Kennecott copper mine in Utah, USA was highly praised (Scovazzo, 2013). Kennecott copper mine is one of the mines operated by Rio Tinto. In a survey of the corporate transparency level of the 105 largest global companies in terms of the level of transparency in their annual reports conducted by Transparency

⁹² Rules 7.1 and 7.2 of the Code

International (a world-leading not-for-profit institution) Rio Tinto was ranked the world's second-most transparent firm (perhaps justifying GRI's A+ Application Level Grade). According to this report, the Norwegian oil and gas company Statoil has been identified as the most transparent firm by a clear margin above Rio Tinto (Kowalczyk-Hoyer, 2012, Burn-Murdoch, 2012).

The report by Transparency International examined three main dimensions of transparency, namely public reporting on anti-corruption programmes⁹³, organisational transparency⁹⁴, and country-by-country reporting⁹⁵ (Kowalczyk-Hoyer, 2012). One major failure of this report, despite its international scope, is that it overlooks the environmental impacts of these firms and the extent to which such information is maliciously hidden from the public. Therefore, it is submitted that the rules provided herewith will result in a more comprehensive regime of business sustainability. Nevertheless, the report by Transparency International provides a reasonable basis for following this particular rule, provided that environmental aspects are also included in the selection process.

There is also ample evidence that lack of transparency has damaged the reputation of the firm involved, and has in many cases ultimately led to loss of business (see RepRisk reports and Index in Chapter 6). Therefore, it is somewhat clear that large and multinational companies should indoctrinate transparency as an ethical pillar within their overall code of conduct, in line with the spirit of the Companies Act 2006.

7.3.1.3. Disclosure Rules and Procedures (Rule 1.3)

It is recognised that details of many business transactions and investment opportunities are often considered as sensitive data. In such cases confidentiality is a key factor in the success of said business within a competitive market. Nevertheless, as explained in Chapters 3, adequate disclosure practices are also an important factor in corporate reputation (i.e. brand

⁹³ Covering bribery, facilitation payments, whistle-blower protection and political contributions. Only a For example, few indicate that facilitation payments are prohibited and reporting on monitoring procedures tends to be weak (Kowalczyk-Hoyer, 2012).

⁹⁴ Including information about corporate holdings. Most of the 105 companies disclose fully owned subsidiaries, but the concept of 'materiality' limits detailed disclosure. Additionally only few companies disclose their affiliates, joint-ventures and other holdings. As a result, many related entities remain hidden from public view and scrutiny (Kowalczyk-Hoyer, 2012).

⁹⁵ Most of the companies disclose little or no financial data on a country-by-country basis. Where they do, disclosure is usually limited to discrete data on a few selected jurisdictions. Very few companies disclose financial data across all countries of operations (Kowalczyk-Hoyer, 2012).

equity, loyalty or recognition) and thus can be a source of competitive advantage. Therefore, it is important that firms actively pursue a balancing act between the rule of transparency and maintaining confidentiality for truly sensitive information.

For doing so, establishing rules and procedures (i.e. internal framework) for disclosure of information should be sought. The extent of disclosure should be as much as relevant (i.e. material information) to the extent of environmental impacts of business operations, and the recipient of this information should be shareholders and other key stakeholders (i.e. beyond legal compliance on disclosure of information)⁹⁶. As such, the proposed framework should be able to identify what risks are significant and guidance on how to identify significant risks in the future.

During the verbal communication with directors and managers at Firm C, it was repeatedly stated that Firm C strives to become a “zero-risk” company; that is to say that the company strives to identify all risks posed to its business operations and reduce them (Schurmans, 2011). Noting that eliminating all such risks is close to impossible, this policy is translated into the publications of the firm pertaining to identifying said risks for the benefit of its shareholders and other stakeholders (Firm C).

It is the general consensus, as explained in Chapter 3, that institutional investors would find an increased level of disclosure of risk to be beneficial to their overall investment portfolios (Solomon et al., 2000, Sinclair-Desgagné and Gozlan, 2003). Furthermore, it was proposed in a major study in 2010 that a positive correlation exists between some aspects of voluntary environmental disclosure quality and future expected cash flows, where a using a specific framework was instrumental to these findings (Plumlee et al., 2010). The GRI framework was used by the firms in question, but the study did not evaluate the validity or the applicability of that framework to those firms.

Whilst it is important to voluntarily produce a high quality report to indicate corporate environmental risks, the more important aspect is the level of consistency of said firm in producing these reports annually. As such, creating a customised framework for the level of disclosure and improving it annually is thought of as the ideal scenario for stakeholders.

⁹⁶ Commentary and analysis pertaining to material information was provided in sections 3.2 and 3.4 above.

7.3.1.4. Continuous Improvement (Rule 1.4)

The concept of Continuous Improvement is based on the principle that change in organisations should be small and continuous rather than structural changes at irregular intervals (Times 100, 2013a, Imai, 1986). The concept is often referred to by the Japanese word 'Kaizen', meaning 'change for the better' and covers all processes in an organisation^{97, 98} (*Ibid*). Within the rule of corporate transparency and stakeholder engagement, there is an enshrined rule for continuous improvement of both disclosure practices (potential and actual) in relation to significant environmental impacts of business operations, and technical (operational and/or manufacturing) specifications.

The importance of continuous disclosure (and improvement of disclosure standards) is evident in Chapter 3 and 6, while evidence of good practice pertaining to continuous improvement and development of manufacturing processes is evident in Chapters 4 and 5. There are many examples of frameworks of continuous improvement in organisations and in management scholarship (operations, strategic and project management), a primary example of which is Total Quality Management (TQM). A key principle of the TQM is continuous improvement, which entails that the “long-term health of an enterprise depends on treating quality improvement as a never-ending quest” (Hackman and Wageman, 1995). Literature on TQM is vast and changing according to business scenarios; thus, this subheading will not focus on that topic. ISO 14001 Environmental Management System (EMS) is also essentially based on the idea of continuous improvement. The market understanding of ISO 14001 rules is that they are based on a cyclical relationship between the following elements: Commitment and Policy, Planning (including goal setting and targets), Implementation (including staff training, documentation, and communication), Evaluation (monitor your programs and adjust plans), and Review (including plans, goals, and the EMS itself) (EPA, 2013b). This cycle is presented in figure 19.

⁹⁷ These include engineering, IT, financial, commercial and customer service processes, as well as manufacturing.

⁹⁸ See SINGH, J. & SINGH, H. 2009. Kaizen philosophy: a review of literature. *The IUP Journal of Operations Management*, 8, 51-72. for more details.

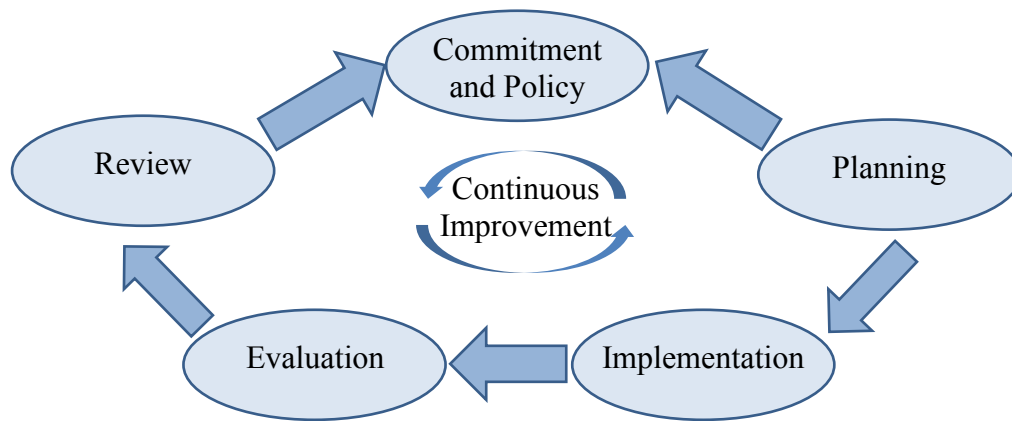


Figure 19: ISO 14001 Continuous Improvement cycle illustration by US Environmental Protection Agency (2013b)

A firm which has implemented this rule more vividly than those examined in the preceding Chapters is Marks and Spencer. The firm's *Plan A* strategy, which was launched in 2007, contained 100 commitments (rules) to be fulfilled (followed) in 5 years. After continuous checks and balances during the years and revisions, these commitments have been extended to 180 to be achieved until 2015 (Marks and Spencer, 2013). These commitments range from consumer involvement, climate change, waste reduction, resource economy, fair partnerships (value chain) and health issues (Marks and Spencer, 2012).

Corus Construction & Industrial also sought to implement a continuous improvement culture within its Human Resources management structure. It means that everyone within the organisation can introduce ideas and engage in deciding how processes can improve (Times 100, 2013a). The firm has nominated 40 of its employees to act as Continuous Improvement trainers, who are tasked with engaging all employees about the processes of the firms and identifying areas which require improvement. Some of the benefits resulting from this are reduced waste through lean production, improved quality and efficiency gains (*Ibid*).

To that end, it is clear that the role of continuous improvement can almost be ubiquitous in different layers of organisation activity, in order to achieve different results. The focus in this section is corporate governance, which entails that firms should establish rules and procedures for implementation continuous improvement as a strategy for their disclosure standards. Of course, this rule should also be central to managing other areas of company activities such as environmental standards pertaining to manufacturing and other operational procedures.

7.3.1.5. Identify and Communicate Risks (Rule 1.5)

The objective in this rule is not to interfere with business acumen or to suggest whether firms should adopt low risk as opposed to high risk business strategies; albeit that adopting business strategies which entail excessive risk is seemingly contrary to the doctrine of business sustainability. The emphasis, therefore, is to identify risks posed to said firm from, principally, the effects of the activities of said firm on the environment and changes to environmental law. An example for the former scenario is given in Chapter 5 (i.e. risks posed to the company subsequent to changes to waste management regulations), and for the latter is the British Petroleum Deepwater Horizon crisis which triggered a wave of legal actions against the company.

Identification of risk and the severity of failure in doing so have been the focus of Chapters 5 and 3 respectively, whilst evidence of good practice in relation to the landslide in Kennecott mine is provided in Chapter 6. Furthermore, in a survey of the firms in UK's FTSE 100, conducted by the Carbon Disclosure Project in 2011, it was found that 80% of said companies identified substantive risks to their business as a result of climate change (CDP, 2012). Many of said multinational firms appear in FTSE 100, most of whom cited climate change risks with regards to their activities overseas; whilst utilities companies mainly cited UK-based risks as a result of droughts, water shortages and other extreme climatic events.

Therefore, it is expected that firms identify a series of most serious threats posed to the firm as a result of changes to environmental law, climate change, physical operations which may potentially be harmful to human health and the environment. Ideally, firms should have risk management tools that are in habitual use in relation to their key clients and projects. Thus, a framework for identifying the most significant risks should be in place; once said risks are identified, they should not be overstepped. It also follows that said firm should subsequently anticipate and adopt appropriate adaptation strategies.

7.3.1.6. Self-regulation (Rule 1.6)

Self-regulation in the context of business sustainability will ensure that firms maintain and enhance sustainable business practices. Firms such as Marks and Spencer Plc. and Unilever Plc., who have created and implemented sustainability roadmaps, provide good examples of such self-regulation. The value creation for adoption of such sustainability measures remains unclear, but the positive effect of it on the firm's business is not.

Nonetheless, this rule goes beyond these practices: it is expected that the board of directors identify (and consider applying) the most stringent regulation (internationally) pertaining to the disclosure of environmental information and other aspects of corporate governance which relates to environmental, economic or social aspects of business sustainability. These regulations should be viewed comparatively and analysed and amended to fit said firm's business needs. Studies conducted in corporate and industrial self-regulation suggest that this approach is possible within certain industries (Short and Toffel, 2010). At this stage, however, the current rule merely suggests self-regulation of firms as opposed to industries. For added legitimacy, firms may seek to have their self-regulatory activities audited by external firms and entities periodically. Currently, firms using the GRI standards in their reporting are afforded a "+" in front of their application level grades in order to show that said report has been externally audited (for example, A+ as opposed to A).

7.3.1.7. Promote Knowledge Sharing (Rule 1.7)

Further to the rules on increased transparency of a firm toward its stakeholders, it is important to recognise the value of smooth knowledge transfer within the hierarchal layers of an organisation. As such, firms should promote and facilitate information sharing and knowledge transfer within the layers of hierarchy of an organisation.

Argote and Ingram argue that smooth internal knowledge transfer and creation are a basis for competitive advantage in firms (2000). Furthermore, their research shows that embedding knowledge in interactions involving people will enable organisations to both facilitate knowledge transfer internally and impede knowledge transfer externally (because people are more similar within than between organisations, and interactions involving people transfer more readily within than between firms) (Argote and Ingram, 2000). Moreover, research carried out by Dyer and Nobeoka showcases a successful implementation inter-organisational knowledge transfer within the Japanese carmakers, Toyota Jidosha KK (2002). Their research indicates that the six key institutionalised knowledge sharing routines developed by Toyota and its suppliers are a key factor in Toyota's ability to maintain its productivity and quality advantages (Dyer and Nobeoka, 2002).

7.3.2. Environmental Sustainability

As stated above, corporations have traditionally been most preoccupied with their short, medium and long term *economic* viability. By contrast, the concept of sustainable

development, however, is predominantly based on environmental protection, since an active and undamaged environmental system as a whole is believed to be a prerequisite for all activities of humankind, including business activities.

To that end, for resource intensive firms, including but not limited to primary sector enterprises, environmental sustainability is perhaps the most important aspect of global sustainable development and business sustainability, even though it is maintained that the three pillars of sustainability are interdependent and there are significant areas of overlap therein. It is technological breakthrough which can potentially lead to a reduction in the rate of depletion of natural resources. Technological breakthrough requires financial support in scientific research and product/process development and is, as such, correlated with the state of human knowledge. Therefore, this subheading does not insinuate that a state of environmental sustainability will be achieved simply by following the management rules outlined below. The rules pertaining to environmental sustainability have also derived from academic research conducted on industrial-scale services and manufacturing firms. These firms tackled one aspect of environmental sustainability, namely efficiency of water use.

Therefore, it follows that the rules contained within this subheading are also based on increased efficiency of water-intensive sectors. However it is submitted that these rules may be amended to meet different needs in different industrial sectors. For example, where water output quality is concerned, the analogous legislation or good practice examples may be used in order to achieve an equally high standard of air being fed back to the environment through factory chimneys. The same applies to soil quality, forests, rivers, commons, and all elements which, according to the Aarhus Convention (and all other regulations referred to thus far) fit within the definition of *environment*. The rules below tend to focus on environmental sustainability with an emphasis on water management as a key factor within the definition of environment.

7.3.2.1. Incorporate WII (Rule 2.1)

Water footprint within a value chain was traditionally a measurement of the volume of water consumed. However, in attempting to create a novel and more insightful water footprint mechanism, Firm A produced the Water Impact Index (WII). WII assesses the quality of the water extracted and released into the environment and accounts for water stress levels in the particular geographical area, together with the volume of water used throughout the value

chain. Thus a comprehensive formula has been formed which encompasses all three factors of water scarcity volume consumed and quality (see section 4.5.2 above).

WII (accounting for water volume, quality and stress) is the latest water scarcity index with the aim of facilitating decision making pertaining to water consumption in different geographical areas. The application of this formula and the methodology behind the assessment of water footprint has formed part of Firm A's integrated solutions and services. This formula was first used in Milwaukee (USA) where it led to improved performance of the municipal water network as well as reducing its water impact (Firm A). More information about the value creation as a result of implementing this formula is provided in Chapter 4.

As such, it is submitted that firms should take account of the constituent factors within WII and use this formula to account for the true water footprint value of their products. Doing so will primarily be beneficial to said firm to the extent that it will help the efficiency of their value chain (in terms of resource use and costs). Research should be carried out in order to find similar solutions for examining the real effect of corporate activity on other aspects of the environment such as air pollution and soil degradation.

7.3.2.2. Efficiency (Rule 2.2)

It follows from the previous rule that firms should maintain or enhance the level of water efficiency of their manufacturing plants and processes. This rule has been derived from evidence of good practice documented in Chapter 4. The importance and urgency of resource⁹⁹ efficiency was highlighted earlier in this Chapter with reference to the McKinsey report titled *Resource Revolution* (McKinsey Global Institute, 2011). The report draws attention to risks posed to firms as a result of unsustainable use of natural resources, while identifying business opportunities enshrined in changing the corporate behaviour towards resource efficiency (*Ibid*).

The firm in question in Chapter 4 was Firm B which commissioned Firm A to install a new Waste Water Treatment Plant in their manufacturing plant in Suzhou (Jiangsu Province, China) which resulted in 75% reduction in chemical consumption, 52% reduction in sludge,

⁹⁹ Resources utilised may differ from one firm to another depending on the requirements and production of said firm.

26% improvement in quality of water, 35% reduction in GHG emissions, 52% improvement in Carbon efficiency, and Reduction in Direct and Indirect water consumption.

Another company whose water efficiency efforts have been widely recognised is the international brewery firm, SAB Miller. The firm saved an estimated 500,000m³ of water during 2001-2010¹⁰⁰ (SAB Miller, 2013a).

7.3.2.3. Substitution Principle (Rule 2.3)

It follows from the previous two rules that firms should in all circumstances attempt to use the best available techniques/technology (BAT) within their manufacturing processes. This is in order to reduce overall water consumption, wastage of water, and to preserve the reservoirs/rivers in which water output is deposited (for example, closed loop water circulation).

The Industrial Emissions Directive (Directive 2010/75/EC) provides references to BAT, to the extent that:

“In order to determine best available techniques and to limit imbalances in the [European] Union as regards the level of emissions from industrial activities, reference documents for best available techniques (hereinafter BAT reference documents) should be drawn up, reviewed and, where necessary, updated through an exchange of information with stakeholders and the key elements of BAT reference documents (hereinafter BAT conclusions) adopted through committee procedure. In this respect, the Commission should, through committee procedure, establish guidance on the collection of data, on the elaboration of BAT reference documents and on their quality assurance. BAT conclusions should be the reference for setting permit conditions. They can be supplemented by other sources. The Commission should aim to update BAT reference documents not later than 8 years after the publication of the previous version.”

The *BAT Reference Documents* (BREFs) which are stated in the passage above refer to a list of reference documents which are provided by the European Commission. The objective of BREFs is to facilitate the exchange of information as prescribed in the framework of Article

¹⁰⁰ See section 7.3.2.4 for more details.

13(1) of the Industrial Emissions Directive (IED, 2010/75/EU) (European Commission, 2013d). Said BREFs contain guidance in accordance to the principles of exchange of information pertaining to BATs in several different industries. The IED is a major environmental Directive regulating some 50,000 industrial installations in the EU on industrial and agricultural activities (European Commission, 2013a). Reference documents are produced through consultations with expert stakeholders. It is noted that the United States Environmental Protection Agency through the Clean Air Act, 1990, also requires the use of best available techniques in relation to air quality and pollution (see section 3.4. above).

BAT has been referred to on numerous occasions throughout this thesis. It should not be forgotten that one of the main incentives for conducting business operations in a sustainable manner is that it should be more financially lucrative in the long term in comparison to damaging the environment, human health and communities while conducting business. To that end, it should not be expected that all firms, irrespective of their size and financial strength should commit to using the best available techniques and technologies in their operations; rather, the use of BAT should be in relation to such factors. Article 1(10) of the Industrial Emissions Directive of the European Union (Directive 2010/75/EU) defines BAT as:

‘best available techniques’ means the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole:

- (a) ‘techniques’ shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned;
- (b) ‘available techniques’ means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;
- (c) ‘best’ means most effective in achieving a high general level of protection of the environment as a whole.

Paragraph (b) is noteworthy in that it states that inherent within the principle is the consideration for “economically and technically viable conditions, taking into consideration the costs and advantages”. Thus, BAT requires that the feasibility of new techniques and technologies be taken into account, and is also often referred to in the United Kingdom context as BATNEEC – Best Available Techniques Not Exceeding Excessive Costs (Sorrell, 2002).

BATNEEC could be seen as a convergence of two European policies: the emphasis on technical feasibility and ‘state of the art’ technology in German pollution regulation (BAT); and the emphasis on economic feasibility and pragmatic, case-by-case decision-making in UK regulation (NEEC) (Boehmer-Christiansen and Skea, 1991). Therefore, it is clear that when there is reference to BAT, the requirement for economic feasibility is also enshrined within this principle.

Again, the Firm B and Firm A partnership is a good example of firms cooperating in order to use the best available technology for sustainable purposes and reduce production costs. Different components of this partnership (and the benefits thereof) are provided as examples of the rules throughout this Chapter.

7.3.2.4. Scarcity and Manufacturing (Rule 2.4)

It is submitted that firms should be mindful that water-intensive manufacturing plants should not be built in water-scarce areas. As the famous case of Coca-Cola shows, the firm’s reputation was damaged severely in India and subsequently internationally. In several provinces in India, Coca-Cola’s extraction from water sources led to water poverty for the local communities. Water extraction by the firm adversely affected local communities in terms of water quality and quantity. These operations led to many protests in numerous locations thorough out India (Levitt, 2009, Master, 2011).

An example of good practice is found in the case of Yatala brewery, which located in a water-stressed area of South East Queensland, Australia, and is operated by SAB Miller. The water saving mechanisms in place led to an award by the Environmental Protection Authority to recognise the plant as one of the best examples of sustainable manufacturing in the region (SAB Miller, 2013b).

7.3.2.5. Water and Air Output Quality (Rule 2.5)

Firms should pay special attention to the quality of their water output in terms of its effluent standards and ecological status. This should be done with special attention to the requirements of EU's Water Quality Framework Directive (WQFD) (Directive 2000/60/EC). The WQFD requires that all water bodies under the control of EU Member States reach a "good" ecological standard. Firms whose operations are water-intensive should actively push for reaching and exceeding these standards in the spirit of Article 14 of said Directive.

By way of an example, both of the solutions provided by Firm A for implementation at Firm B's manufacturing plant included wastewater treatment plants which utilised ground-breaking technologies and reduced the quantity of water output being poured into the Wu Song River.

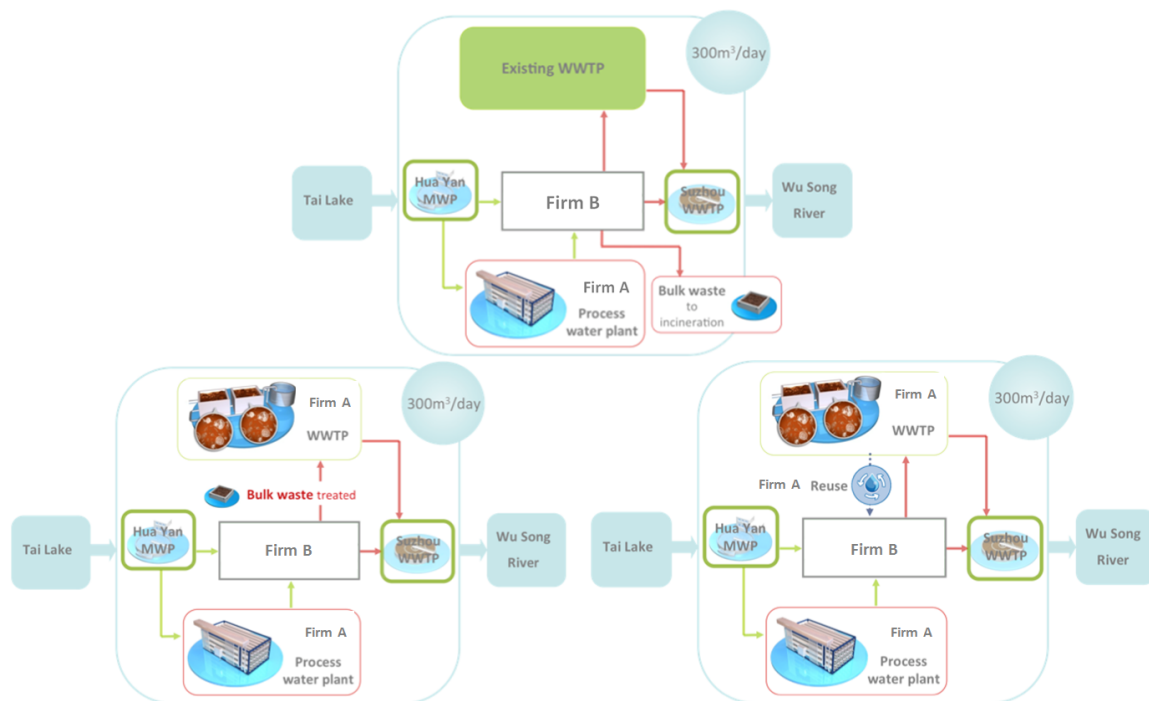


Figure 20: Two solutions for installation of a new wastewater treatment plant by Firm A

In terms of air output quality, manufacturing firms (in particular) should actively pursue the objectives of the EU clean air policies including the standards set in the Ambient Air Directive (2008/50/EC). Furthermore, firms should facilitate and enhance the path to reaching the ultimate goals of the European Union that is "to achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment." (European Commission, 2013e)

An example with regards to air pollution is provided by Khorasan Gypsum Ltd in Iran. In 2005 the firm acquired the “electro filter” technology in order to reduce its emission of various dusts. The visual difference in emission of pollutants is clear in figure 21 below¹⁰¹. Prior to 2005 the firm utilised a chimney system which benefited from “cyclone” technology; this system reduced air pollutants by a maximum of 65% (Tabatabayian, 2013). The new chimney benefits from an “electro filter” technology which eliminated 95% of normal pollutants, resulting on a small amount of water vapour being emitted from said chimney (*Ibid*). It is noteworthy that the firm currently only uses the latest “electro filter” technology in all its production line, in the spirit of Rule 2.3.



Figure 21: The difference between emission of air pollutants between the old (left) and the new (right) industrial electro filters at a gypsum manufacturing plant (Khorasan Gypsum, 2013)

This was a step beyond legal compliance in Iran where regulations pertaining to industrial air pollution continue to fall below international standards, as stated in the new bill for reduction of national air pollution, which is yet to be enacted into law (Parliament Research Centre, 2013).

7.3.2.6. Direct and Indirect Footprint (Rule 2.6)

Firms should be mindful of the direct and indirect water consumption and carbon emissions (water and carbon footprint) of their resources and products. Knowing the full carbon and

¹⁰¹ The text in the picture is in Persian; the right text reads “Pollutants emission from the new electro filter” and the one on the left hand side reads “pollutants emissions from the old electro filter”.

water intensity of a finished product will enable said firm to reduce carbon emissions and water consumption throughout its value chain. This rule is of paramount importance to large and multinational manufacturing firms such as car manufacturers, steel producers and those in the oil and gas industry (among others). The best available techniques should be used in doing so. Business-related benefits gained due to a reduction in water and carbon footprints of products range from reputational gains (and brand value) to reductions of overhead costs.

Figure 22 shows the proposed methodology for a novel calculation of the real water footprint of a given product by Firm A (i.e. direct and indirect water footprints). When calculating the WII, Firm A uses a lifecycle perspective, to the effect that both the direct and the indirect water consumption are included.

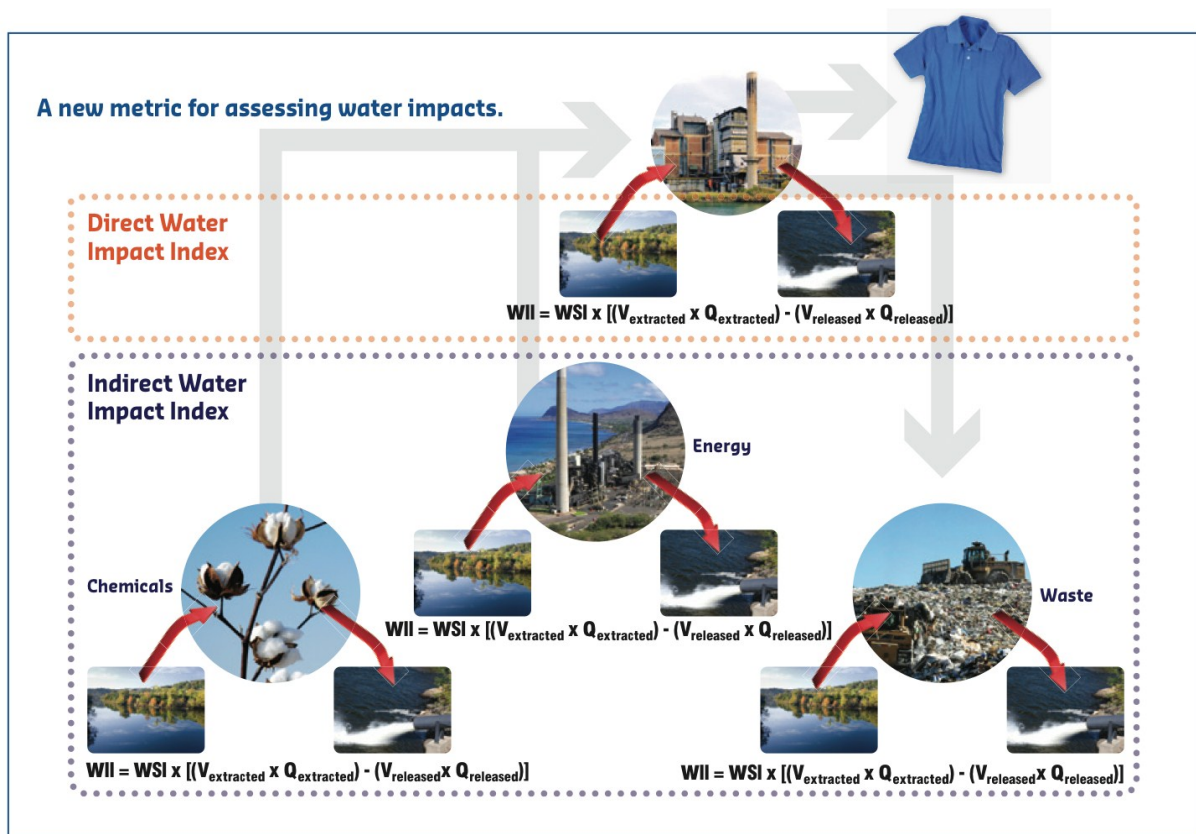


Figure 22: Calculating the real water footprint of a given product (Firm A)

Calculating the direct water impact is done by utilising the WII equation and is possible when data is available. In theory this would have to be done for every indirect process, which would be inefficient. Thus to facilitate the calculations, Firm A considered compiling an

indirect Water Impact Index database in partnerships with key universities and leading industries (Firm A).

One of the side benefits arising from the partnership between Firm B and Firm A is the reduction of indirect water consumption and carbon intensity of their products as well as direct footprints. The diagram in Figure 23 below provides a further example of new methods developed by Firm A for calculating the real carbon intensity (i.e. direct and indirect) of finished products.

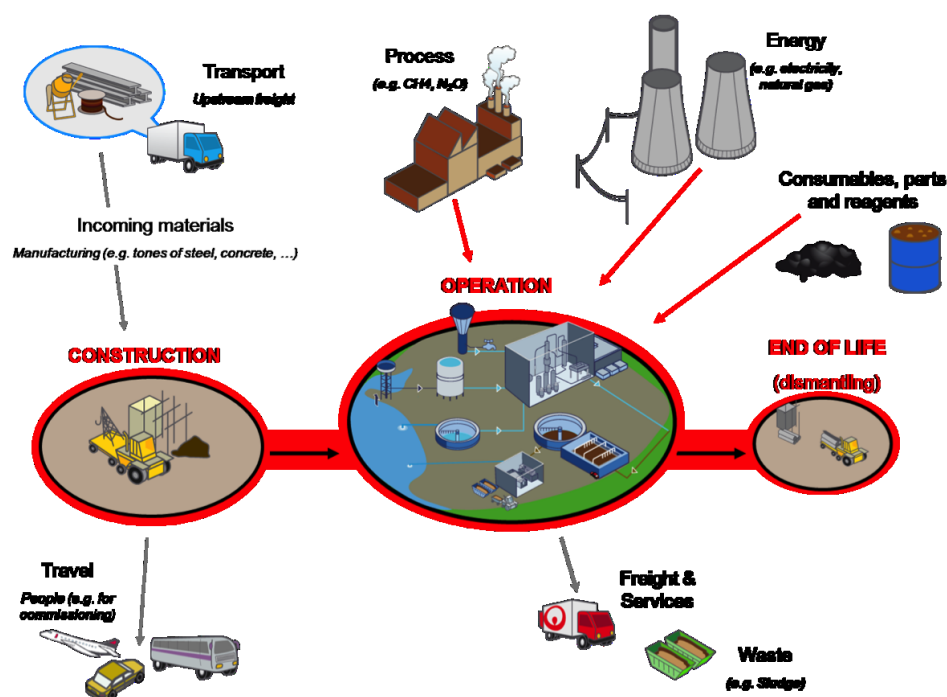


Figure 23: Methodology produced by Firm A for calculating the total cost of carbon emissions (Firm A)

In order to obtain a comprehensive figure of an industrial plant's carbon emissions, Firm A suggests that both direct carbon emissions (i.e. process emissions (for example, CH₄, N₂O), energy produced and used on site to run the plant) and indirect emissions (i.e. concrete, steel, freight, parts, consumables, chemicals) should be taken into account (Firm A).

7.3.2.7. Preventative Principle (Rule 2.7)

This rule is in order to improve environmental quality or safeguard the environment if improvement is not possible or economically feasible. In particular, firms should ensure that action is taken before negative environmental consequences occur. This principle is particularly important for firms which are planning to explore markets within developing

countries. Thus, such preventative measures should be incorporated from the beginning, even though if local regulations impose standards below internationally recognised norms.

The rule applies to all aspects of the environment, such as air, land, water quality, biodiversity, and atmosphere. Where possible, and where full protection cannot be achieved firms should apply an improvement target in order to effectively prevent pollution and enhance environmental quality and human health. This goes hand-in-hand with Rule 2.3 in relation to BAT.

7.3.2.8. Precautionary Principle (Rule 2.8)

This rule calls for proactive action with regards to climate change and environmental damage, despite a lack of comprehensive and decisive scientific evidence. Therefore, in the absence of sufficient scientific and environmental knowledge, firms should still apply the precautionary principle and conduct business accordingly. The rule follows the development of the *Precautionary Principle*, as it was laid out in the Treaty on the Functioning of the European Union (Lisbon Treaty, Article 191).

The prevailing objective of this principle and the following ones, therefore, is the minimisation of potential consequences where a certain risk exists. There are examples of a rules-based system whose basis is rooted in the precautionary principle, such as Health and Safety rules. To that end, the purpose of the Health and Safety at Work Act 1974 [of England and Wales] has been stated as “to make further provision for securing the health, safety and welfare of persons at work, for protecting others against risks to health or safety in connection with the activities of persons at work, for controlling the keeping and use and preventing the unlawful acquisition, possession and use of dangerous substances, and for controlling certain emissions into the atmosphere; to make further provision with respect to the employment medical advisory service”.

It is thought that risk assessment should form an integral part within the precautionary principle – in line with Rule 1.4. It is also suggested that the precautionary principle, like many other Rules in this Chapter should be considered in most (if not all) decision making situations.

7.3.2.9. Sustainable Resource Management (Rule 2.9)

Firms should actively pursue strategies aimed at reducing their reliance on finite resources. Furthermore, during the transition period to renewable energy recourses, current (conventional) energy sources should be used sustainably. For example, firms should actively prevent the diminishing of renewable resources, while allowing for scientific uncertainties in light of the precautionary principle (maximum sustainable yield).

Sustainable use of natural resources could mean anything from energy efficiency to water savings to sustainable fishing and forest preservation. In most cases in industrial-scale production, taking advantage of the best available techniques and technologies could lead to the reduction in production costs (and costs of raw materials); for example, through implementing new processes which would use electricity more efficiently for the same rate of production.

Another example could be the case of batteries and the extent to which different types can be recycled. For example, lead-acid batteries seem to be the most recyclable, such that 96% of them are recycled in the US (EPA, 2013a). Thus, in theory, in purporting to use lead-acid batteries for power generation, it will follow that only 4% of the new batteries will have been produced using new raw materials (such as lead). On the other hand, dry-cell lithium batteries seem to be the most challenging in terms of recycling (Kumar, 2013).

7.3.3. Economic Sustainability

Traditionally, the remit of the concept of economic sustainability for businesses has not been the firm's financial performance, since that is expected to be published for the benefit of said firm's members in annual reports (GRI, 2011b). Thus, economic sustainability has been defined as an objective, which entails that the stakeholders of large and multinational firms should benefit economically from the presence of said firm in their communities (for example, through added employment, raising standard of living, improvements in health, etc.). However, as stated in the outset of Chapter 5, for the purposes of the current thesis, economic sustainability will take account of the effect of certain corporate strategies on the economic performance of said firms, in light of changing environmental regulations and restrictions in utilising natural resources.

7.3.3.1. Climate Change Financial Risks (Rule 3.1)

In connection with Rule 1.3 and 1.4, to the extent that is financially practicable, firms should minimise all risks posed to business activities from climate change and other environment related changes. These efforts range from climate change adaptation strategies to identifying changing market trends in, for instance, insurance (and reinsurance) and transportation industries where environmental regulations can potentially change much of the current market dynamics.

The average annual temperature in central England has risen by 1°C since the 1970s, which has led to various climatic and seasonal changes throughout the country (CCC Adaptation Sub-Committee, 2010). In 2010, these changes had led to average of £1.5 billion of insurance costs from climate related claims (*Ibid*). As such, it is clear that the British economy, and subsequently its constituent companies have been adversely affected thus far. It is therefore natural that firms would strategically adapt to such changes. The report commissioned by DEFRA stated above (in 7.3.1.4. *Identify Risks (Rule 1.4)* section) refers to 80% of the largest firms in the UK identifying substantive risks to their business as a result of climate change.

As one of the industries most affected by climate change, the Association of British Insurers successfully negotiated with the British Government that the national flood defence capital should be increased from £344 million to £370 million. This increased capital has been fixed to the national rate of inflation until 2021 (ABI, 2013).

Furthermore, in a response to the survey conducted by the Carbon Disclosure Project (as commissioned by DEFRA), Royal Dutch Shell responded in the following terms with respect to the firm's outlook on climate change adaptation:

“[...] At present the full technology required to understand all impacts of climate change on our assets or new projects in all regions is not available, but good information is available in some regions and it is planned to use this as a pilot to investigate how climate change adaptation will be undertaken in the future. In parallel, capacity in climate change and adaptation are planned to be built into this area to ensure that the skills, techniques and data are available to develop these types of criteria routinely for all new projects. We are planning to undertake screening of existing assets and new assets and estimation of their exposure to physical climate

change and associated cost of adaptation. This work is expected to be completed over the next few years at the end of which we will have a clearer understanding of the costs associated with adaptation.” (CDP, 2012)

One of the most effective mechanisms for reduction of risk, or at least disclosing information pertaining to real risks, is complying with an international standard (which is yet to be established) for environmental accounting. This issue is discussed at length in Chapter 3. Not much progress has been made in producing an internationally accepted standard for environmental accounting and its scope (for example *vis-à-vis* carbon, other GHG emissions, water pollution, soil degradation or biodiversity preservation). A recent comprehensive academic research paper was conducted on deriving the current definition of carbon accounting by means of a systematic literature review, including different perspectives and research streams (Stechemesser and Guenther, 2012). It was found that no such comprehensive and detailed definition exists which would fit within the requirements of national, project, organisational, and product scales (*Ibid*). There have been much debate on the way forward for carbon accounting, but a comprehensive international standard is yet to be established. Other potential components of a fully comprehensive environmental accounting standard seem to be of a lower priority.

7.3.3.3. Legal Application Framework (Rule 3.2)

In clarifying risks posed from climate change, firms should also formulate a framework of legal requirements in order to reduce legal risks and aid decision making processes. These frameworks should be easy to understand for all concerned within relevant layers of management and technical personnel, be flexible in nature and facilitate interpretation of the law based on input of qualitative data. The *Waste v. Product* decision tree in Appendices II and III, and the framework in Appendix IV are examples of such frameworks which have adopted as internal guidance documents by Firm C.

7.3.3.2. Clarify Applicable Law (Rule 3.3)

In line with the previous rule, service-oriented firms and manufacturers should seek clarification of all applicable legal provisions whose aim is to protect human health and the environment from the effects of said firm’s business operations. This should be done through thorough consultation with experts and at times even regulators. Where regulators are consulted for legal clarification, organisations concerned should ensure that said

communication is done in writing in order to be afforded additional legal protection. Consulting industry experts and relevant regulators is a key element pertaining to exercising due diligence, which would afford significant legal protection should the issue in question result in litigation.

Regulations can potentially be drafted with inherent ambiguities, which add confusion to business operations and hinder long-term strategic planning. Firm C's attempt to clarify the legal position with regards the classification of objects, materials or substances as waste, products or by-products is a valid example of good practice in this regard. In doing so, Firm C had also communicated with the Dutch authorities about the status of objects, materials and substances whilst in transit.

7.3.3.4. Direct Dialogue (Rule 3.4)

This step should be taken subsequent to steps outlined in Rules 3.2 and 3.3 above. In terms of waste classifications (and indeed other such cases where ambiguous legislation is drafted), given the risks involved in a misinterpretation of the law, firms should consider direct dialogue with EU Member States (or other such municipal regulator). As stated in Chapter 5, Member States may have differing interpretations of the law; for example, though it is not consistent with the Directive, some Member States determine that when a material, object or substance is moved off-site then it becomes a waste while other Member States do not make this location-based conclusion. As with above, such communications should be done in writing in order to be afforded the legal defence of due diligence.

7.3.3.5. Supremacy of Stringent Law (Rule 3.5)

Where legislation pertaining to waste (or any other environmental factor) is less stringent than the rules and procedures set by firms (based on Rule 1.3), the internal rules of the firm should prevail. The more stringent regulations should also be followed in event of conflict of laws. This is also in line with the Precautionary Principle.

7.3.3.6. Culture of Sharing (Rule 3.6)

Firms should promote a culture of information and technology sharing within the same industry and sector in order to continuously enhance the best available techniques for the protection of environment and human health. Such a culture has been prevalent within Silicon Valley since 1960s, where companies would actively cooperate with one another without

remuneration in order to find and eradicate bugs in computer chip processors – the so-called “pay-it-forward” culture. This culture of knowledge sharing was deemed one of the most important factors in the rapid growth and development of the firms in Silicon Valley (Blank, 2011). It is not, therefore, untenable that such a culture could also be effective in heavy industries for solving common problems whose solutions will bring wide-spread environmental benefits.

Naturally, information sharing should be promoted subject to observing confidentially *vis-à-vis* intellectual property, sales data and other trade secrets.

7.3.4. Social Sustainability

7.3.4.1. Human Rights Code of Practice (Rule 4.1)

In conjunction with Rule 1.3, firms should produce a Code of Practice for the benefit of the board of directors in order to monitor the company’s corporate culture. These Codes should adhere to the Universal Declaration of Human Rights as a basic requirement. In specific industries where international bodies have specified a minimum requirement in terms of health and safety, those should be implemented as the basic code of practice; for example the International Labour Organisation has implemented mining standards which are beyond what is provided in the local legislation of India, Iran and China (Oraee et al., 2010).

If local legislation imposes a higher standard of Human Rights, those standards should prevail. For example, the mining industry in the United States imposes various – and often arduous – legislation pertaining to health and safety in mines (for example, MSHA and NIOSH requirements) which go far beyond the basic requirement of the UDHR.

7.3.4.2. Training (Rule 4.2)

Firms should ensure that their employees are adequately trained in *sustainability* and other miscellaneous training as applicable. These will be discussed in turn.

Firstly, firms should ensure that all their employees receive training in sustainability and sustainable corporate behaviour. Training should be tailored to the needs of said firms depending on their business type and industrial sectors. Once such a training programme is designed, it should be further modified according to the requirements of employees at

different hierarchal levels of said organisation. What is clear is that all of the Rules within this Chapter should be fully understood and supported by all of the employees of said organisation. This approach was taken by Corus Construction & Industrial when implementing their internal strategy of continuous improvement (Times 100, 2013a).

Veolia Environment has also strived to achieve the same through several training programmes, most of which are aimed at instilling sustainability values within their workforce. Two of said managerial-level training courses are conducted by Imperial College London; one is in the form of a comprehensive (and formal academic) sustainable management course¹⁰² and the other by way of sustainability workshops which are held periodically for company directors¹⁰³ (Imperial College London, 2013).

However, it is noteworthy that sustainability training is required in all aspects of a firm's activities and in almost all business types, even for those which may not be immediately obvious. A good distinction would be sustainability training for firms in water or waste management as opposed to banks or accounting firms. It is further recommended that said training programmes be evaluated against key performance indicators.

Secondly, firms should ensure that all employees and contractors' employees receive adequate training in technical capabilities, health and safety and rescue operations (hard industries). This should include projects conducted internationally, where the legal requirements are less rigid regarding health and safety at work compared to the home state of said organisation.

In Chapter 6 the value of human capital was demonstrated for the mining industry in the United States (in the context of the cost of roof falls and landslides in mines). It was clear that mining firms would benefit greatly from short term costs on adequate safety mechanisms and training in technical expertise.

An example of good practice in this area would be that of Marks and Spencer Plc. The firm places a special emphasis on the training and development of its staff, such that competency profiling is used in order to identify gaps in skills of the workforce. Once these gaps are

¹⁰² Veolia Imperial Pathfinder Programme.

¹⁰³ MBA Leadership Development Programme.

identified, a career path is developed that meets the needs of employees as well as those of the business (Times 100, 2013b).

Figure 24 shows one possible way in which employee skills may be placed on a diagrammatical scale in order to determine the requirements for reaching optimum staff efficiency.

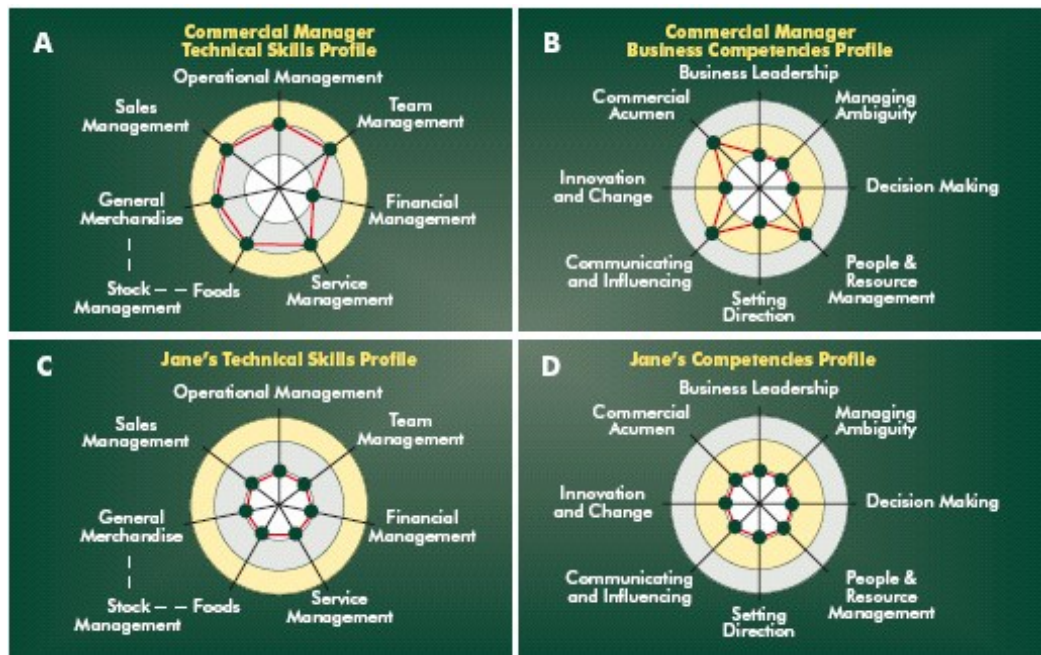


Figure 24: Profiling of employee competencies and skills (Times 100, 2013b)

In the example in Figure 24, standard profiles (A and B) for a commercial manager's technical skills and business competencies are provided in diagrams A and B. Jane's (hypothetical character) personal profiles (C and D) are compared to profiles A and B to assess what training and development is required for Jane to be most efficient in this position. Furthermore, all managers at Marks & Spencer are able to develop a career path to support their personal career-planning ambitions. Then specific training needs are identified based upon the technical skills and business competencies for a role which is desired within said career plan. Their profile also highlights what programmes of training Marks & Spencer needs to plan for (Times 100, 2013b).

7.3.4.3. Indigenous Communities (Rule 4.3)

Multinational firms which venture into new geographical territories and markets should always ensure that the rights of incumbent local communities and indigenous persons are

observed and protected. This rule is important in the long-run in the context of stakeholder management for companies involved. Ineffective stakeholder management strategies (or the lack thereof) could be extremely detrimental to companies with a wide range of external stakeholders, such as local communities and regulators.

Observing this rule should be of paramount importance when considering the feasibility of a new project and also for incumbent manufacturing sites. Where practicable, expropriation rules from the parent company's state shall be applied; for instance, if local legislation is weak in substance or otherwise infringes human rights under international law.

In Chapter 6 the extent of reputational damage suffered by Rio Tinto was demonstrated after the firm failed to adequately compensate the communities which were dislocated because of Rio Tinto's mining activities. The same observations should be extended to environmental damages resulting from large industrial activities. Steps such as consulting communities prior to said venture, negotiating rights and responsibilities, agree and complying with said agreements could form part of a simple framework for protection of indigenous communities.

7.3.4.4. Supply Chain Management (Rule 4.4)

The case studies conducted in this thesis did not examine this rule. However, it appears that one of the most important debates surrounding the issue of social sustainability is supply chain management. This is in order to ensure that benefits of sustainable business activities reach a wider community than those in the immediate vicinity of the firm (or alternatively that the adverse effects of unsustainable business activities are limited). Furthermore, examples of cases where human rights and labour rights abuses by a secondary firm in the supply chain have caused severe adverse reputational damages to a multinational enterprise are plentiful.

One recent example was that of the international group of clothing and accessories retailers: In April 2013, Rana Plaza, a major sawing factory which produced the products of Hennes & Mauritz, Primark and Inditex in Bangladesh collapsed and resulted in the death of more than 300 of its employees (Kazmin, 2013a, 2013b). In operational terms, Rana Plaza was a supplier of these firms and as such fits within their supply chain. The collapse and subsequent outrage in western communities led to adverse reputational effects for these firms, which in turn could lead to loss of market share and thereby revenue (Kazmin, 2013a). To that end, all

three firms, *inter alia*, began reviewing safety standards and other working conditions in the factory floors of their suppliers in order to maintain their customer base (Mallet, 2013, Johnson, 2013).

It is, therefore, submitted that a company which seeks to operate in accordance with the principles of sustainability, should consider the effect of the business operations of all of the operators in its supply chain as opposed to “those links which belong to its own sphere of legal responsibility” (Windsor, 2006, Hauschild et al., 2005). In doing so, firms should follow decision making tools to ensure that environmentally and socially responsible decisions are made throughout the supply chain of said business (Hutchins and Sutherland, 2008). Where the nature of the suppliers’ business activities is labour intensive, firms in question should ensure that the supplier abides with certain criteria, which are designed in advance and accepted as the minimum standards of the firm in question. These could be conditions such as health and safety, anti-discrimination and equal pay. The current Rules-Based system is one such tool whose aim is to facilitate framework-based decision making.

7.3.4.5. Effects in the Long Run (Rule 4.5)

Firms should ensure that the long term effect of a large-scale business operation on the living standards of indigenous persons will be largely positive, or at least have a neutral overall impact. This includes, but is not restricted to, employment, health, education and environmental protection. Following this rule will ensure that the company’s corporate social responsibility (moral) duties are met. It is often believed that following corporate social responsibilities leads to increased brand equity, especially for fast-pace consumer products.

An example of this case could be found in the global nuclear industry. Sellafield nuclear facilities in Cumbria (northwest of England) are undergoing decommissioning activities. Cellar Hall nuclear plant was added on the same site in mid-1950s, where currently the main focus is on managing waste safely and cleaning up the legacy of the past, at an estimated cost of £67.5 billion (Pfeifer, 2013). Lack of sufficient technological development for finding a permanent solution for high-level nuclear waste is one of the most significant challenges facing the industry globally (*Ibid*). The Nuclear Decommissioning Authority was established by the government of the United Kingdom in 2005 to oversee these activities.

Another appropriate example would be the case of Veolia Water's innovations for potential business challenges in the next 25 years, which was drafted in consultation with major stakeholders and experts. These challenges will include demographic, regulatory, political thinking, customer expectation and price changes. To that end, Veolia Water predicts that by 2030, the number of households the firm supplies to will increase by 25% (against a predicted rise in population of 13%), whilst water resources will shrink by 2% (Veolia Water, 2011). The firm also intends to increase the number of households who use water meters to 90% by the same year in order to charge its customers more accurately (*Ibid*). The company also submits annual reports to DEFRA, which is in line with the requirements of Climate Change Act 2008 pertaining to its strategy on adaptation to climate change in which reference is made on several occasions to the firm's 25-year plan (*Ibid*).

7.3.4.6. Introduce and Utilise KPIs Objectively (Rule 4.6)

When reporting on sustainability measures, firms should refrain from selectively choosing the reporting criteria, and the extent to which said criteria are reported upon. This is thought as one of the most serious criticisms of the GRI reporting framework. Furthermore, key performance indicators (KPIs) should be utilised in the spirit of EU Modernisation Treaty and Companies Act 2006 in order to analyse the extent of change in respective criteria annually.

KPIs are seldom used by firms and reporting standards alike, even though comparison of KPIs produces a vivid description of a firm's sustainable development. As such, a verified example of good practice in implementation of this rule is difficult to find. This Rule is linked to rule 4.2 above in relation to employee training, *inter alia*.

7.3.4.7. Protecting Source of Income (Rule 4.7)

Multinational firms which venture into new geographical territories and markets should always ensure that the new market remains competitive and that smaller market operators are not overwhelmed.

According to economic theory, the larger a firm is (in a homogenous market), the greater economies of scale said firm enjoys. This is generally due to decreasing marginal costs of production as a result of spreading overhead costs over a larger number of production units. "Economies of scale" usually enables firms to offer the same products at a cheaper price compared to the incumbent firms, who often suffer as a result of a sudden increase in

competitive forces. It follows that said firms should ensure the safety of livelihood for local communities and protecting their source of income by refraining from anti-competitive behaviour. It is understood that in many jurisdictions outside of the United States and European Union, market competition regulations (antitrust law) do not exist. Thus, in absence of such regulations, the antitrust regulations of jurisdictions where the parent company is based should be expropriated and applied in the new market. Relevant multinational firms should voluntarily adhere to such standards. Doing so will be in line with the judicial precedents set by *Connelly v. R.T.Z Corporation Plc. and Others* and *Lubbe and Others v. Cape Plc.*, as demonstrated in section 6.2.1 above.

The same applies to those whose livelihoods are affected by environmental degradation caused by the activities of the firm in question (in line with Rule 4.3). As such, where a firm's venture into a new market causes a termination of agricultural activities of members of the local community, said firm should either facilitate an alternative source of income or at least make an adequate compensation. In the context of risk management, firms should also account for loss of competing uses of natural resources where public goods are concerned. For example, where natural resources are public goods, site installations should be avoided if said operations large amounts of said public good, and thereby restrict their availability to the incumbent community (in line with rule 2.4).

This rule should be extended to other instances where a firm's activities have played a part in diminishing the source of income of a member of the local community.

7.3.4.8. Community Engagement and Empowerment (Rule 4.8)

Firms should proactively create mechanisms for community empowerment and engagement and treat their local communities as a key stakeholder group. There are many examples of community engagement and empowerment in the US and EU. The vast majority of the firms in UK's FTSE100 and S&P 500 in the US work with their local communities in order to boost the firms' CSR activities. For example, Kellogg Company (*Kellogg's*) engages in many activities to engage and empower local communities such as: global network of donations to food banks to help alleviate food poverty; working with farmers within the firm's value chain to achieve a level of sustainable agriculture, thereby creating a more sustainable source of income for said farmers in Malawi and Kenya; and help create breakfast clubs in Uganda,

Kenya and Zambia for school pupils resulting in up to 57% increase in school grades (Times 100, 2013c).

The effect of these activities by large and multinational firms within communities follows a multiplier effect. For example, research commissioned by SAB Miller showed that for every person it employs in Uganda, the company's presence supports a further 200 jobs or more in the wider economy (Boersma, 2013).

Firms involved will enjoy significant loyalty base and support from communities as a result of such empowerment activities. Ideally, these activities should fit within the brand identity and vision of the firms involved. If not, then those community engagement projects should be chosen which would have the most significant positive effect on communities.

7.3.4.9. Sustainability Education (Rule 4.9)

Rule 4.2 stressed the requirement that firms should actively pursue and create opportunities for sustainability education among internal stakeholders. This would be in the form of education and training among all hierarchical layers of a given firm will help highlight and internalise the necessity of sustainable business growth and development.

The current rule, however, stresses the importance of dissemination of sustainability education among external stakeholders, particularly in the case of poor communities where access to education is limited. Firms should also promote universal environmental and sustainability education among communities locally and internationally in order to teach these values to the next generation of business leaders and employees. There are many examples where large and multinational firms support education at university level with academic scholarships and research funds. Though, seldom examples of funding for sustainability education in order to enshrine sustainability values at an early age at school level are found. This rule is of particular importance in light of ever decreasing government funding for academic research and education.

7.4. Conclusions

To provide thorough reasoning based on case study research for each of the above rules will require significantly more time and space than those permitted under the regulations of Imperial College London; in order to provide a set of rules which are applicable to individual

firms' needs, each rule will have to be derived subsequent to thorough economic feasibility studies and cost benefit analyses. This is what is required by means of continuing research subsequent to the completion of the current PhD project.

The majority of the rules above were derived from various aspects which were dealt with throughout the thesis. The commentary pertaining to each rule also explains how the relevant rule may be implemented. Examples are provided where possible about good practice in different industries where the rules have been implemented. It is important to note that where companies are identified by way of example, it is not the company itself as a reputational entity which is being examined, but rather said firm's activities. To complete this branch of research will require more in-depth research about the extent of the problems that the rules are aimed at solving. This should be followed by a step-by-step implementation guidance note for each rule.

The rules-based system above, as derived from four substantive industrial case studies, is deemed sufficiently developed in order to show that understanding and implementing corporate sustainability requires a rules-based approach. This statement is made notwithstanding the significant limitations that one is faced with in understanding the concept of sustainability. One of the main such limitations is that, due to the nature of this debate, it cannot be restricted by using traditional research methodologies. The concept of sustainability concerns the most complex naturally occurring system known to man, namely the environment; and the concept of sustainable development is seen as a solution for growth without causing environmental damage.

Human knowledge is limited and, thus, is yet to fully understand the global environmental system. It is illogical to expect that a framework containing thirty-one rules provides the solutions to the global challenge of sustainable development. Therefore, it is important to recognise that the current debate is an ongoing one whose focal points should first be understood; these have been identified as the three pillars of sustainability together with an appropriate corporate governance structure. Subsequently, research must be carried out in each area respectively and then integratively (for interactive considerations which may or not require trade-offs), followed by industry-specific research in order to solve real and relevant problems faced by the most polluting industries and their stakeholders.

8 CONCLUSIONS

Chapter 8: Thesis Conclusions and Recommendations

This research thesis began with the notion that in a resource-constrained world firms can generally be classified in two categories: those which conduct their business activities according to the concept of sustainability, and those which do not. The overarching hypothesis was that firms of the former category are likely to be more economically successful in the long run in comparison with those in the latter group. It was found that the constituent factors of sustainability were unclear, and the current sustainability reporting frameworks did not clarify them. For example, the leading sustainability reporting framework, namely the GRI, requires reporting on many aspects of business activity, but does not indicate whether the activities reported upon contribute to a sustainable business operation¹⁰⁴. Therefore, it follows that current sustainability reporting frameworks do not

¹⁰⁴ A detailed discussion about efficacy of reporting standards is produced in Chapters 3 and 6.

sufficiently assist said firms, nor institutional shareholders (and other stakeholders) in advancing their sustainability needs. Counter-intuitively, this is happening whilst a combination of increasing consumer awareness and the enlightened shareholder value principle has led to an upward trend in investors seeking to invest in ethical and responsible organisations (Richardson, 2013, French et al., 2008).

After conducting a broad literature review, it was important to understand the efficacy of the current consensus about the constituent pillars of sustainability; it is believed that the triple bottom line model merely provides an introduction to the vast and complex subject of corporate sustainability. It has been understood that while the original *triple bottom line* model provides a valid classification of the three important aspects of sustainable development, it is only capable of scratching the surface of this problem. Thus, it was found that the *three-pillar* model should be broadened to include a dimension on “corporate governance” in order to fully integrate sustainability thinking within an organisation.

There are countless contributing factors to an unsustainable business conduct in each of the three main pillars, many of which often overlap. For example, shareholders of a given firm may elect to change the course of a firm in order to avert an accident which may later lead to an environmental catastrophe. In this instance, corporate governance and the concept of shareholder primacy is in play in order to implement an environmentally sustainable business plan, namely avoiding an environmentally damaging accident. This in turn will lead to avoiding grave financial consequences, reputational damages for the firm involved as well as damages to the immediate communities. This is a brief outline of what occurred as a result of the explosion at the Deepwater Horizon oil rig at BP, with the exception that in that case, material information was withheld from key decision makers and shareholders. As such, a failure in the corporate governance structure of BP directly led to severely adverse consequences for the society, the environment, the local economy and of course, the firm’s long-term competitiveness.

There was overwhelming evidence in the example of BP in 2010 that the accident was caused due to a systemic failure in management and due to cost-cutting practices. It was also found that said explosion was foreseeable, provided that the correct safety procedures had taken place. However, this is not to say that all manufacturing firms or those in the oil and gas industry should now solely focus on the part which caused the explosion in that case and take

steps to prevent it. Rather, it is a testament to the complexity of the concept of corporate sustainability and the number of variables which can affect it. To that end, this thesis would not suggest that following the safety procedure which BP failed to follow will certainly prevent all such future environmental damages.

Thus, to clarify what constitutes sustainability, as a second step it was necessary to conduct industry-based case studies focused on these constituent pillars of sustainability (with the addition of corporate governance) to demonstrate good practice (or the lack thereof) of firms in accordance with the generally accepted sustainability principles.

Even though researchers and academics have identified many aspects on which firms should provide sustainability reports, the exact factors which affect sustainability of corporations are relatively unknown. It follows that the academic community is yet to be able to find a silver bullet to help all firms to be managed in accordance to the principles of sustainability, irrespective of their fields of activity.

As a final step, in order to fully contextualise the findings of each case study, it was deemed necessary to compile said findings in a comprehensive rules-based framework. These rules have been drawn from the findings of the research conducted in the thesis together with evidence of good practice seen elsewhere. They have been drawn in an open and flexible fashion so that they would appeal to a wide range of industries.

In order to reach a definitive set of rules which would benefit firms and regulators alike the thesis has taken a journey through various aspects of corporate sustainability, while each Chapter has taken a step closer (according to the methodology) to the creation of the rules-based system. For example, in Chapter 3 the importance of reinvention of corporate governance in the wake of the rise of institutional shareholders and consumer awareness has been highlighted. The review of current trends and regulations, together with a comparative law approach, highlights the deficiencies in law and practice pertaining to corporate environmental disclosure. These deficiencies, together with evidence of strong regulation in other jurisdictions, and examples of appropriate corporate governance structures in some firms have led to the compilation of the rules in relation to corporate governance.

The following Chapter reveals the wide-ranging environmental benefits arising from a corporate collaboration in installing sustainable technologies and implementing new processes to that effect. All parties involved in this example benefited from said project. As such, this case study clearly provides evidence of good practice within the realm of industrial scale environmental sustainability. The subject matter of this Chapter is waste water management. However the overarching principle is the use of Best Available Techniques and technologies (BAT) – a rule which can be extended to any industrial actor pertaining to improvements in their water and energy consumption, air pollution, GHG emissions, bio diversity preservation and so on.

Chapter 5 examines the importance of clarity in legislation of the European Union pertaining to Waste Management to the Economic Sustainability of firms. In doing so, said legislation is clarified using case law and judicial analysis, which is followed by a novel framework for decision-makers on the correct legal status of the objects, materials and substances in question. This Chapter demonstrates methodologically how a rules-based system might operate on an industrial scale in terms of regulatory compliance. Furthermore, the framework produced in Chapter 5 was commissioned by Firm C, which is presented as clear evidence of the utility of such rules-based frameworks within the industry (see Appendix IV).

Chapter 6 takes a different approach by examining the financial and reputational damages suffered when firms do not heed social sustainability as a central business strategy. In doing so the mining sector has been chosen as a labour-intensive industry, in which working conditions are hazardous and the effect of the firms' operations on communities is usually significant. Therefore, as explained in the Methodology Chapter, evidence pertaining to lack of good practice in terms of the current understanding of sustainable business practice is gathered from this case study. These evidences are then studied in terms of their adverse effects on the firms involved and on their stakeholders. The rules resulting from this Chapter are drawn to help firms understand what constitutes socially sustainable business practice.

8.1. Research Questions

A number of questions were asked in Chapters 1 and 2 as the principal research questions within this thesis. These questions have been answered at length through case examples and subsequent analyses. For example, where dealing with corporate risks and the reduction of

risk that attends the implementation of sustainability rules, it is shown that in many different industries this rings true. It was stated in the Methodology Chapter that this question is particularly relevant in the wake of ever scarcer resources and the numerous environmental disasters which have been caused due to corporate mismanagement. Thus, it is of utmost importance that the twin risks of environmental damage and resource depletion are mitigated in order to overcome the global challenges of resource efficiency and sustainability.

A number of case examples have been analysed throughout the thesis in order to assess whether risks are reduced as a result of following sustainability rules. Examples from BP and Rio Tinto have shown that lack of adherence to procedures pertaining to sustainability can lead to a significant increase in operational risks. On the other hand, the example of Firm A, Firm B, Firm C and the Insurance industry clearly demonstrate that firms in different industries and sectors seek to reduce risk levels posed to their business operations from climate change and other environmental legislation (i.e. waste management law). This is particularly true in the case of Firm C and that of the insurance industry. However, Chapter 3 clearly demonstrates that the board of directors should ensure that a suitable governance structure is in place within the organisation in order to effectively manage operational risks. As such, the three pillar model will effectively help in mitigating operational risks only if, as a starting point, said firm benefits from an appropriate governance structure.

Regulatory risks posed to firms arise from at least two sources. First, there is the evolving nature of environmental law, which entails that the current extent of rights and responsibilities pertaining to environmental safety and health will normally be extended as world population rises and environmental resources become more constrained. Secondly, as discussed above, global climate change poses severe risks to firms such as those in the insurance industry. When these risks are materialised they will be followed by litigation, which in turn translates into an increase in regulatory risk.

It is submitted that one of the main incentives to follow the rules-based system provided in Chapter 7 is that it will help mitigate regulatory risks in two ways. Firstly, it will reduce overall operational risks, which should in turn reduce the likelihood of environmental disasters subsequent to accidents (such as was the case in Deepwater Horizon). Secondly, following such a framework will most likely provide a defence of *due diligence* for the firm involved in a court of law. A valid example of mitigation of regulatory risks is, again,

provided by the case study of Firm C, where the firm actively sought to reduce its exposure to litigation pertaining to waste management legislation.

Throughout the thesis it has been found that the current understanding of sustainability as it applies to corporations is incomplete. This is due in part to the inefficacy of current sustainability reporting tools such as the GRI. These frameworks provide guidelines for *reporting* on fixed issues by participating firms. This, in turn, adds to confusion among institutional shareholders and other external stakeholders. However, that is not to say that said report will reflect an accurate image of the extent to which the participating firm follows sustainability principles.

The industry-based case studies in this thesis have highlighted some of the areas in which firms can improve their operations in terms of environmental, economic and social sustainability. These findings are incorporated into a rules-based framework. Furthermore, first-hand experience with Firm C revealed that such a framework is suitable and can indeed assist in addressing sustainability questions. The framework devised for Chapter 5 is a clear example of a rules-based system which, if followed, would enhance sustainability in firms (see Appendix IV). It follows that viewing sustainable development in the context of a rules-based system is one of the most effective methods for successfully incorporating sustainability principles in corporate strategies.

Furthermore, it is submitted that a framework of rules is capable of being applied to key areas which would generally meet the needs of large and multinational firms. Chapter 7 of this research thesis has been drafted wholly in a manner which would address this consideration. This is also fully in line with the consensus within the group of experts that responded to the verification survey which was conducted as part of the current project.

However, at the current stage of development of this rule-based system, it is questionable whether all firms would voluntarily apply all the rules to the same extent. One of the main weaknesses in the current sustainability reporting frameworks is that they are drafted in a way in which they are expected to be ubiquitously applied by all firms irrespective of the industrial sectors in which they operate. It is understood in this thesis that, while it is important to adhere to a number of rules pertaining to corporate sustainability, it is equally important that said rules be flexible in principle. This is not to say that they should be flexibly

implemented; but rather that some rules may be substituted with those which may be better suited to the specific circumstance of the firm involved. Still, it is of utmost importance that new rules, if any, should still meet the spirit of the original Rules-Based System. For example, it is difficult to justify why banks or other financial institutions should be aware of water scarcity as part of the firm's sustainability agenda; however, it is not unjustified that said bank or financial institutions should refrain from investing (or otherwise supporting) a large or multinational company which extracts water for manufacturing from water scarce areas (this would be in line with the principles of ethical investing).

As stated briefly in Chapter 1, reference to institutions in organisational theory entails that firms (as corporate organisations) seek to produce rules as part of an institution and abide by them. Similar to the current sustainability reporting frameworks, accession to such an institution is assumed to be voluntary in absence of legislation. To that end, implementation of the rules produced in Chapter 7 is left to the device of the firms involved. Enforcement, by way of ensuring these rules are implemented, should not be a source of concern providing that suitable corporate governance structure is in place (i.e. first category of rules).

The rules in Chapter 7 have been drawn with the view that the vast majority of them can be flexibly applied to industrial-scale multinational firms (these are deemed to have the largest effect on the components of sustainability). Where rules have been provided which refer to specific examples, such as those pertaining to environmental sustainability derived from the new Waste Water Treatment Plant in Chapter 4, they have been drawn in a way which may be easily amended to reflect similar scenarios in relation to a different aspect of the environment. Thus it is the submission of this thesis that the rules within the framework in question should be followed by firms insofar as practicable and economically feasible.

As stated throughout the thesis, the ambit of the topic of corporate sustainability (and its constituent aspects) is inherently broad; the factors involved in the different aspects of sustainability often overlap with one another. It follows that extensive research focusing on different industries is to be carried out in order to solidify our understanding of corporate sustainability. The following section will highlight the recommendations which the author makes for the advancement of human knowledge in this discipline.

Finally, it is submitted that understanding the concept of sustainability as a rule-based system is a contribution to knowledge. Furthermore, this approach adds value in terms of specifying the focal points for implementing corporate strategies based on sustainability principles, rather than leaving it to the definitional vagaries of “sustainable development” and “sustainability”, to which the thesis has previously called attention.

8.2. Further Research and Recommendations

Naturally, this thesis has been constrained in scope in order to produce results in a specific area of interest within a restricted time frame. As such, there are many aspects of corporate sustainability which have fallen outside of the scope of this research. These are explained further in relation to each Chapter as follows.

The concept of institutionalisation (subset of organisational theory) as relevant to sustainability and sustainable development is an interesting source of research. It is important to conceptualise the current trend in corporate sustainability from an institutionalisation perspective in order to assert whether firms still take a short-term view of the business (namely profit making in light of Milton Friedman’s school of thought), or whether they truly seek to improve the rate of resource consumption and impacting their stakeholders in a positive way (according to Joseph Stiglitz’s school of thought).

In Chapter 3, it is submitted that Corporate Governance is a vast area of research. Like many topics within social sciences, the ambit of Corporate Governance is unclear. For example, while it is clear that disclosure of information (for the benefit of members including institutional shareholders) is central to the subject area, it is unclear whether this includes information on environmental impacts of the firm. As such, the view has been taken that reference to *information* should be interpreted widely so as to include environmental information, which is deemed crucial for institutional shareholders. To that end, further research has to take place in order to develop the topic of corporate governance. A simple and comprehensive framework for implementing good practice in corporate governance is deemed necessary. Furthermore, the debate surrounding sustainability should be expanded in order to include said framework on corporate governance.

Chapter 4 contains a specific case study on improvements in environmental (and economic) indicators after installing a new waste treatment plant. Much of the benefits demonstrated

relate to reductions in water consumption. Case studies have to be conducted in industrial and / or manufacturing plants of a similar scale, where new technologies are installed whose main objective is, for example, the reduction in CO₂ emissions, soil degradation, or preservation of biodiversity. This is so in order to demonstrate the economic and / or financial benefits of using such technologies. Furthermore, in line with the dynamic nature of the debate of sustainability, new and improved environmental sustainability criteria have to be considered.

Chapter 5 leaves almost no doubt in the definition of waste and the ambit of Directive 2008/98/EC. However, it is recognised that the waste Directive and the deficiencies therein are only one area of environmental law which hinders corporate sustainability as a whole and economic sustainability in particular. It follows that a decision-making tool similar to that which was created in Chapter 5 should be designed in order to clarify other environmental regulations of the European Union. The framework produced in Chapter 5 is crucial to definitively understand and determine the correct classification of waste versus product and by-product. Such a framework would certainly be useful in other aspects of compliance with environmental law.

The ambit of Chapter 6, namely social sustainability, is also unclear. Firstly, some argue that social sustainability is the founding basis of the concept of sustainable development. Furthermore, the concept of corporate social responsibility is heavily intermingled with social sustainability. The understanding of the author is that one of the main criticisms of the concept of sustainable development and corporate sustainability (and more specifically their social aspect) is that they lack a clear definition and an ambit. This is seen as a major source of concern for firms: to what extent is it really the responsibility of the firm to be mindful of its stakeholders (morally and in the long terms interests of the firm)? The openness of the social aspect of sustainability naturally leaves the subject open for contention. Further research should be carried out in order to clarify the extent to which the long-term interests of a firm dictate the social responsibility of said firm is. Such a research project should focus on specific industries so that the group of stakeholders in question, their needs and how they are impacted are made clear.

Lastly, Chapter 7 is the area in which further research is most required for improving the current framework. It is submitted that a rule-based system is what firms prefer most in addressing sustainability concerns and sustainable development. However, the rules-based

system provided in Chapter 7 is still in its infancy. This framework will become most effective when a number of versions of it are created which are bespoke and focus on one industry in particular (if not one firm). Subsequently, case studies similar to those produced in this PhD thesis should be conducted in the four key areas of sustainability. A rules-based system which is produced as a result of a focused four-part study will be most beneficial to the firms in said industry. It is thought that the most suitable way for progress to be made in this field is to conduct pilot programmes implementing these rules. In doing so, firms which perform environmental services or whose operations are conducted sustainably should be examined first, since they are likely to be most acquainted with the mission and goals of sustainability; also, the application of said rules should assist these firms in developing new client bases or enhancing existing client offerings particularly in the interest of environmental resource and / or energy efficiency. Arguably, larger environmental service firms will have access to any additional internal resources that are required in this regard. The findings of this pilot study should then assist when implementing the rules for firms in other sectors.

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Appendix I

List of Publications

Publication	Reference
Book Chapter(s)	• Makuch Z, Oraee-Mirzamani N, Corporate Law and the Aarhus Convention, in: Environmental and Energy Law, Editor(s): Makuch, Pereira, Wiley Blackwell Publishing, 2012
Journal Article(s)	• Oraee-Mirzamani N, Tadayyon Tahmasebi B, Oraee-Mirzamani B, Makuch Z, Efficacy of Sustainability Reporting and Strategies, Sustainability Journal, 2013 (<i>Pending</i>) • Oraee-Mirzamani N, Makuch Z, Corporate Environmental Disclosure Law, Fiduciary Duties and the Aarhus Convention, European Energy and Environmental Law Review, 2011, Vol:20, Pages:18-29, ISSN:0966-1646
Corporate Consultation Documents	• Oraee-Mirzamani N, Makuch Z, Waste Law Guidance: “Waste” and “(By) Product” Distinctions, Prepared for ExxonMobil (internal use only), 2012 • Oraee-Mirzamani N, Makuch Z, New Decision Making Tools & Integrated Solutions For Sustainable Wastewater Treatment: An Industrial Case Study, Prepared for Veolia Water Solutions and Technologies, 2011
Conference(s)	• Makuch Z, Oraee-Mirzamani N, The Importance of Human Capital to Business Sustainability in Mining Companies, World Mining Congress 2013, 2013 • Oraee-Mirzamani N, Tadayyon Tahmasebi B, Oraee-Mirzamani B, Makuch Z, Efficacy of Sustainability Reporting and Strategies, Creative Solutions to Global Challenges, Global Sustainability Institute, Anglia Ruskin University, May 2013. • Oraee K, Oraee-Mirzamani N, Goodarzi A, The Effect of Legislation on the Development of Coal Mining Industry, Mining Metallurgy and Exploration Annual Meeting 2013, 2013 • Oraee K, Oraee-Mirzamani N, Goodarzi A, A Management System to Develop Occupational Health & Safety in Ground Control Operations of Underground Mines, 31st International Conference on Ground Control in Mining, 2012 • Oraee K, Goodarzi A, Oraee-Mirzamani N, Economic Analysis of the Copper Mining Industry of Iran, Society for Mining, Metallurgy and Exploration Annual Meeting • Oraee K, Oraee N, Goodarzi A, Analysis of Ground Control Codes in the International Codes of the International Labour Organisation, 29th International Conference on Ground Control in Mining Proceedings, Pages:1-4
Poster(s)	• Glatzel K, Oraee-Mirzamani N, Sustainable Technologies to Alleviate Water Scarcity: The Case of Jordan, Creative Solutions to Global Challenges, Global Sustainability Institute, Anglia Ruskin University, 2013.

Compliance with Imperial College Regulations

Research on the current research project began on 4 October 2010, and final revisions were made during the last fortnight of September 2013. According to the Centre for Environmental Policy's guidelines, certain requirements which have to be met throughout the process of a PhD research project. One such requirement is the MPhil transfer examination, which must be completed between 18 and 24 months after the commencement of the PhD project (Centre for Environmental Policy, 2010). The relevant MPhil Transfer examination was conducted twenty-two months after the commencement of this research project (August 2012). Another requirement was the submission of "The First Year Report", which was completed and submitted on 12 July 2011.

Furthermore, as part of the regulations of Imperial College London, PhD candidates are required to attend 4 "*A List*" Transferrable Skills courses provided by the Graduate School for Engineering and Physical Sciences. The table below indicates the courses which have been attended by the current PhD candidate.

Course	Date	Type
Effective Communication: Stop, Look, Listen & Learn	03/11/2010	A List
Time Management Made Simple	03/11/2010	A List
Project Management for Researchers	05/11/2010	A List
Becoming an Effective Researcher	08/11/2010	A List
Presentation Skills	10/11/2010	A List
EndNote	14/12/2010	B List

Table 8: List of Transferable Skills courses attended and the corresponding dates

The citations made in the current thesis conform to the Harvard Referencing style, in accordance with guidelines of Imperial College London (Imperial College London, 2012). The author is mindful that the preferred referencing styles among legal scholars are the Harvard Bluebook and the Oxford Standard for the Citation of Legal Authorities (OSCOLA).

Appendix II

2008 Waste Framework Directive Article 3(1) - Waste Definition

The legal definition of waste turns around at least one of three circumstances in which a holder may be taken to “discard” an object, substance or material. Once the three (maximum) “discard” decision steps are taken, then the lower boxes at the bottom of the decision tree identify other categories into which the object, substance or material might fall.

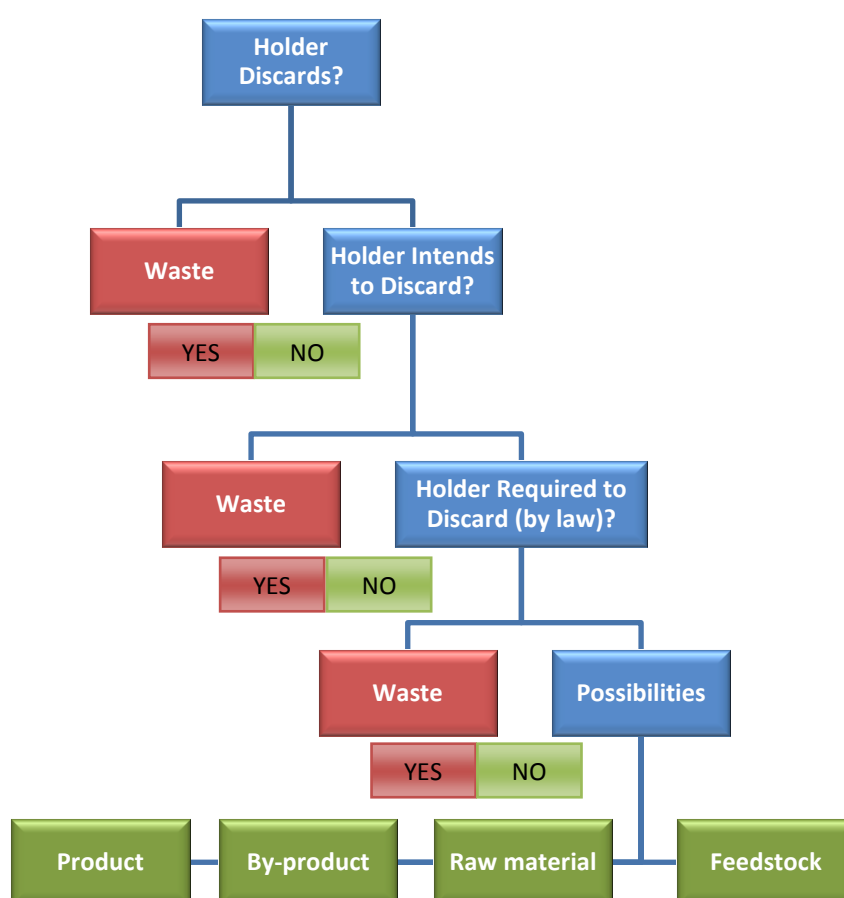


Figure 25: Flow chart demonstrating the legal definition of waste, according to Directive 2008/98/EC

Table 9 containing **Waste Criteria** is provided below, in order to aid decision making whilst using the decision tree in figure 25.

Waste Criteria	Yes	No
Will the material be next used in a disposal or recovery operation by anyone (<i>ARCO Chemie</i>)?		
Does it have hazardous properties beyond its properties as a product		
Has the substance already been addressed as a waste by industry practice or by regulation or legal order?		
Is it a discarded secondary raw material (e.g., like scrap) (<i>Mayer Parry and Niselli</i>)?		
Is there indefinite storage of the material (<i>Palin Granit</i>)?		
Does the substance contain contaminants that are beyond those found in it when the substance forms part of its intended product?		
Has the substance been consigned to an operation conventionally regarded as recycling, recovery (e.g., discard of solvents for regeneration) or disposal (e.g., spreading of material on land for a beneficial purpose is not disposal)		
Is the substance being recovered rather than undergoing an ordinary industrial use (i.e., grinding or crushing can be such a use <i>European Commission</i>) (Note: An Annex II recovery operation may also be an ordinary use and hence a “waste” conclusion is not automatic)?		

Table 9: Waste criteria framework (drawn from section 4.4.)

Appendix III

Waste v By-product Decision Tree

Below is a decision tree for accurately classifying an object, material or substance as a By-Product or Waste.

This decision tree has to be used in conjunction with other decision-making tools in Appendices II and IV.

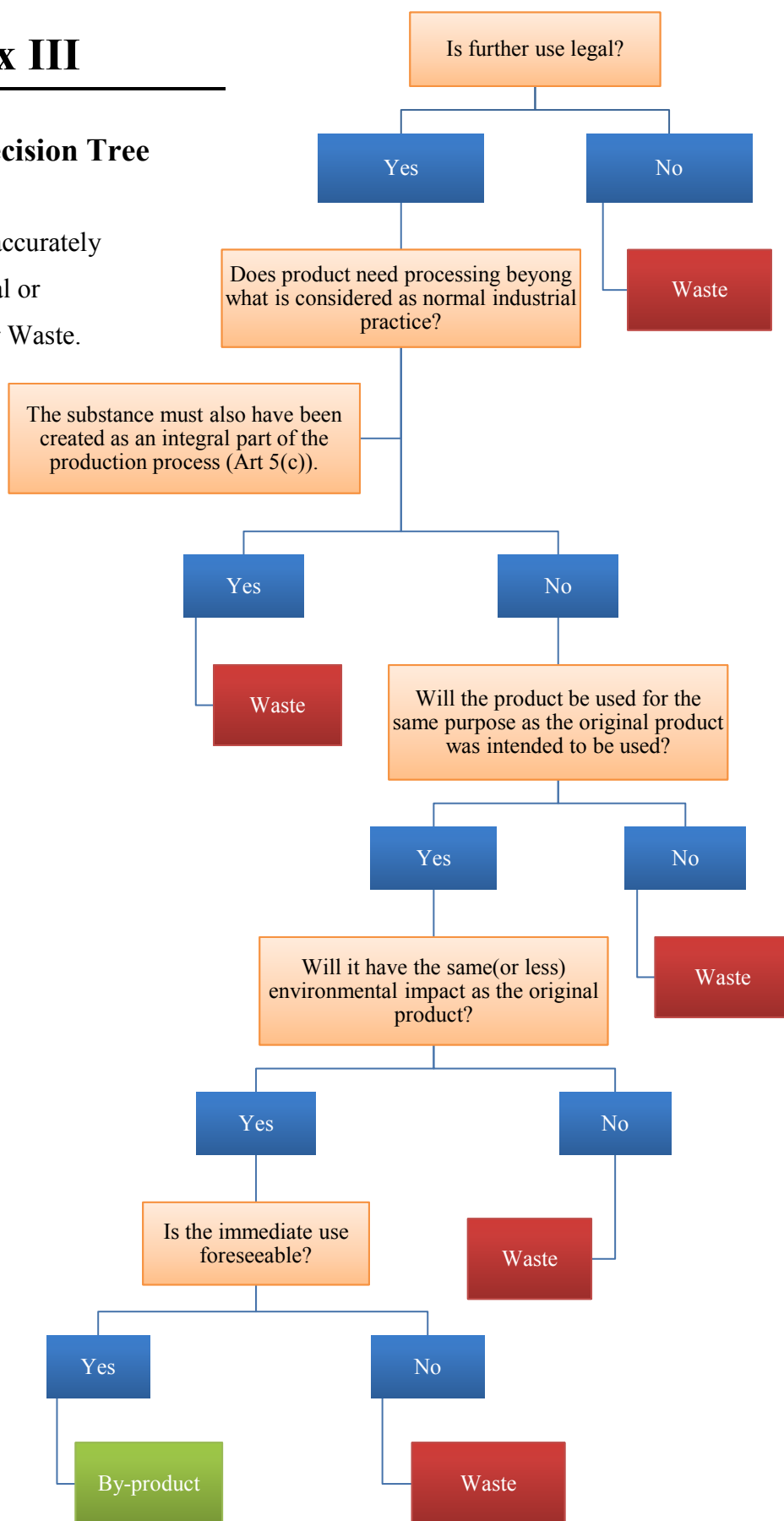


Figure 26: Elaborated Waste versus By-product decision making tool

Appendix IV

Decision-making Framework for Waste Classification

This section provides instructions for use of the framework which is at the end of in this Appendix¹⁰⁵.

The Chapter is intended to provide a useful way to understand relatively complicated decisions that need to be made as to whether an object, substance or material is a waste (or a product or by-product as the case may be). As a number of Member State jurisdictions will wish to have greater certainty in this regard, it is important to be able to characterise whether *specific* materials, subjects or objects that are conventionally part of production activities are wastes rather than products or by-products. As such, a table has been designed specifically for this purpose. The tables will assist manufacturers and other relevant stakeholders in understanding whether specific objects, materials or substances (for example, spent catalysts, low quality lubricants, second hand oil that is used with bio energy) are wastes. The tables may also be useful in discussing the “waste” status of such objects, materials or substances with regulators, insurers and other relevant stakeholders as the need arises.

It is important to note that sometimes a definitive conclusion cannot be made in this regard due to the inconsistent findings of individual Member State regulators. As such a lack of certainty may exist before a regulator makes a conclusive determination for a specific object, substance or material. Nevertheless, the tables are sufficiently detailed to provide important evidence and analysis for making such a determination taking account of EU legislation, case law, best practice and legal reasoning.

By looking at the left column of the table it is easy to understand how to follow it. Traffic tree colour coding is used to determine the status of, for example, low quality lubricants or spent catalysts as either a waste (**red**) or not a waste (**green**). If the outcome is completely uncertain then an “**amber**” colour will be used. Said colour coding appears down the first

¹⁰⁵ These tables and the accompanying instructions were originally produced for the internal consumption of Firm C. Therefore the materials which have been used in the framework are those which were of particular concern to Firm C. They have been included in this report by way of an illustrative example.

column. If there is no colour coding then that is because the column does not apply to the example. The left column has the following headings:

- **Waste Discard** which addresses the current EU legislative definition of “waste” (Article 3(1) of the Waste Directive (2008/98/EC))
- **“Waste” Criteria** in which a series of questions help in analysing the relevant Community law, both in terms of Directives and case law. This has been divided into two types of questions, namely waste-related questions and product related questions. This division has been made in order to further clarify the questions which will be asked in order to classify a substance as a waste as opposed to a product (and vice-versa).
 - **Waste questions** which reflects relevant European case law, reasoning and experience
 - **Product Definition** which reflects the current European case law, reasoning and experience of what is meant by “product”
- **By-Products Definition** which reflects the current EU legislative definition of “by-product” (Article 5 of the Waste Directive)
- **End of Waste** which reflects the current EU legislative definition of when a waste ceases to be a waste as per Article 6 of the Waste Directive

If each of these headings is taken in order then the following points are worth noting in relation to the analysis for each column:

Waste Discard – a “YES” answer for any of the questions results in an automatic conclusion that the object, substance or material being analysed is a waste.

“Waste” Criteria – the colour scheme has no real significance in terms of the classification of the substances; it is merely to distinguish the *Waste questions* from the *Product questions*.

- *Waste Questions* have been designed in a way so that “NO” answers will provide evidence that the object, substance or material is a waste. A majority of “NO” answers will lead us to the conclusion that the substance will not be classified as a waste.

- *Product Questions* have been designed in a way so that “YES” answers will provide evidence that the object, substance or material is not a waste (as opposed to a waste).

There is no specific number of “YES” or “NO” answers which, when added up yields to a conclusion that an object, substance or material is a waste. To have that answer, one can read the “Introduction and Findings” section in the first box in the table. More “YES” answers in the *Product questions* and more “NO” answers in the *Waste questions* generally leads to the conclusion that the object, substance or material is not a waste. The fact that an object, substance or material can be a product or a by-product will mean that it will not be a waste.

By-Products Definition – For the nine questions in “**bold**” type face the pattern must be as follows in order for an object, substance or material to meet the definition of “by-product” and therefore to be excluded from the definition of “waste”:

1. YES;
2. YES;
3. YES;
4. YES;
5. YES;
6. NO;
7. YES;
8. YES; and
9. YES.

Any variation on any of these answers will exclude the object, material or substance from being characterised as a by-product. As such, it may well be seen as a waste.

End of Waste - With respect to this column of questions a “YES” answer to each of questions 1.1, 1.2, 2, 3 and 4 provides evidence that the object, substance or material is no longer a waste. A “NO” answer to question 5 provides evidence that the object, substance or material is no longer a waste. Opposite answers to any of these questions provides conclusive evidence that the object, substance or material is still a waste.

Low Quality Lubricant

Introduction: Low quality lubricants come in a variety of forms. For the purpose of this example an off spec low quality lubricant which is used as grease for heavy farm machinery is being considered (e.g., tractors, etc.).

For this example, it has been determined that the given low quality lubricant is a by-product. It should be noted that in some jurisdictions, for this finding to be legally binding, it must be formally accepted by the applicable regulatory authority. Though the “Waste Discard” and “Waste Criteria” row groupings have also been evaluated with “yes” or “no” it is preferable for this example to emphasise “by-product” definition compliance as this represents an exemption from the application of the 2008 Waste Framework Directive.

Conditions				Analysis	Can it be a (By-) product?
Waste Discard	1. Discard...	1.1. Is the substance discarded by its holder?	No		
		1.2. Is the substance intended to be discarded?	No		
		1.3. Is the substance required to be discarded by EC or national law or contract (<i>ARCO</i>)?	No		
“Waste” Criteria	Waste Questions	1. Will the material be next used in a disposal or recovery operation by anyone (<i>ARCO</i>)?	No		
		2. Does it have hazardous properties beyond its properties as a product?	No		
		3. Has the substance already been addressed as a waste by industry practice or by regulation or legal order?	No		
		4. Is it a discarded secondary raw material (e.g., like scrap) (<i>Mayer Parry and Niselli</i>)?	No		
		5. Is there indefinite storage of the material (<i>Palin Granit</i>)?	No	Only temporary storage	
		6. Does the substance contain contaminants that are beyond those found in it when the substance forms part of its intended product?	No		
		7. Has the substance been consigned to an operation conventionally regarded as recycling, recovery (e.g., discard of solvents for regeneration) or disposal (spreading of material on land for a beneficial purpose is not disposal)?	No		
		8. Is the substance being recovered rather than undergoing an ordinary industrial use (i.e., grinding or crushing can be such a use <i>European Commission</i>) (Note: An Annex II recovery operation may also be an ordinary industrial use and hence no waste categorisation occurs (<i>ARCO Chemie</i>))?	No		

Product Questions	9. Does the substance have an economic value beyond a nominal value to avoid regulation as a waste (<i>Zanetti</i>)?	Yes		
	10. Does the substance meet minimum legislated product specifications or industry specifications?	Yes	Yes, for its use as tractor grease	
	11. Is all or most of the substance intended to be used further in a productive manner (<i>Palin Granit</i>)?	Yes		
	12. Is there a technical choice to produce the substance (<i>Saetti</i>)?	Yes		
	13. Is the substance being used for the purpose for which it was conceived?	Yes		
	14. Is the substance being reused as a waste prevention activity (e.g. like a glass milk bottle) rather than being reused after a recovery operation (e.g., de-contamination of chemical drums)?	Yes	It has not been used before and is not being recovered before sale as tractor grease	
	15. If it is a production residue then is it a by-product (if not then it may well be a waste)?	Yes	A By-Product	
	Note: If a substance has polluting properties that are even greater than they might be when treated as a waste that does not necessarily mean that the substance is a waste (<i>ARCO</i>).			
	Note: The appearance of a substance in the European Waste Catalogue does not determine that it is a waste only that it may be a waste. It would still have to be “discarded” in order to be a waste.			
By-Products Definition	1. Does the substance result from a process not primarily aimed at the substances production?	Yes		
	2. Whether further use of the substance is certain	Yes		
	2.1. Is material stored for an indefinite period of time (<i>Palin Granit</i>)? (A positive answer results in categorisation as a waste. Where some (<i>AvestaPolarit</i>) or all (<i>Saetti</i>) of the material has an actual use it is a by-product)	No		It is a by-product as it meets the Directive Article 5(1) five criteria for “by-product” (criteria 1 – 6 cumulatively).
	2.2. Does market demand equal or exceed production levels? (<i>Spanish Manure</i> market demand from other economic operators is evidence)	Yes		
	2.3. Is market demand sufficiently robust to require imports?		This can be checked	
	2.4. Has there been growth in market demand or is it declining?		This can be checked	
	2.5. Are there contracts for the material, a solid market and financial gains for Firm C?	Yes		

	2.6. Is there a market? (If not, then there is evidence against certainty of further use)	Yes		
	2.7. Is the material useable in the current form? (If not, then there may be evidence against “certainty of further use”)	Yes		
	2.8. Is full usage possible? (If only partial use is possible then there may be evidence against “certainty of further use”)	Yes		
	2.9. Is the financial gain considerable compared to the cost of recovery operations? (If gain is only nominal, then there is evidence against certainty of further use)	Yes		
	2.10. Is indefinite storage possible?	No	Indefinite storage is not intended	
	Note: Regarding Question 1.5. above, it is accepted that spot deals are made with the intention of achieving financial gains. Therefore the substance does not become a waste just because the spot deal price has not resulted in financial gains.			
	3. Whether the substance can be used directly without further processing other than normal industrial practice	Yes		
	3.1. Is the further processing a normal industrial practice related to removal of waste-related characteristics (including for environmental reasons – such as separating hazardous components)?	N/A	No further processing is required	
	2.2. Is there reuse without prior treatment and without harm to the environment or where there is prior treatment is recovery required?	Yes	There is reuse without prior treatment	
	3.3. Is there “further processing” understood as situations where additional “recovery” processes are required (hence, “product” characterization is more likely where additional “recovery” processes are not required)?	No		
	3.4. Are there washing, drying, refining, homogenising, adding materials, modifying characteristics or quality control activities? (These are evidence of normal industrial practice and as such is not further processing)	No		
	3.5. Is the material ready for further use? (NOTE: the more ‘ready’ the better, so as to avoid “waste” status).	Yes		
	Note: Site location for “normal industrial practice” is not material			
	Note: No conclusion should be drawn when “normal industrial practice”, “waste practice” and “waste recovery operations” are similar			
	Note: Consider that raw materials, for example, require some processing before use.			
	Note: Normal industrial practice does not count as “further processing”.			
	4. Whether the substance is produced as an integral part of the production process	Yes		
	4.1. Has a chain of tasks formed an “integral” part of the production process (the	Yes		

	relevant BREF may help)			
	4.2. Is the substance required as part of the primary activities of Firm C? (i.e., whether it is a standard part of Firm C's product lines). This establishes when the production of the substance, material or object is "integral" to the production process		Check with Firm C	
	4.3. Does the substance comply with industrial or Firm C standards? This demonstrates the qualities and characteristics of a "product". High levels of quality control are thus demonstrated	Yes	There is compliance with industrial product standards	
	4.4. Is "further processing" divided into separate and distinct steps (rather than one integrated process)? (<i>SITA Ecoservice</i>)	No		
	4.5. Is modification of the process to produce certain characteristics of the by-product still an integral part of the production process?	N/A	No such modification is required	
	5. Whether further use of the substance or object is lawful in respect of product, environmental and health protection requirements for the specific use	Yes		
	5.1. Is there compliance with EU and national legislative requirements?	Yes	Product standards apply	
	5.2. Is it "lawful" in terms of being in accordance with applicable law (AvestaPolarit and Spanish Manure)?	Yes		
	6. Whether the said use will lead to the same or less overall environmental or human health impacts	Yes		
	6.1. Does the relevant substance meet the relevant technical or product specifications? (the absence of specifications generally means that use is not forbidden)	Yes		
	6.2. Are there potential chemical reactions related to environmental and human health exposure?	No		
	6.3. Are there storage, use and disposal phase implications for greenhouse gas emissions?	Yes	There may be greenhouse gas emissions if there is incineration but this would apply whether said low quality lubricant is a product or a waste. Therefore, there is no net overall adverse impact when in product form	
	6.4. Are there applicable European Norms (EN numbers) and how they might apply in relation to environmental protection guidance?	Yes	There is product compliance	
	6.5. Are there human health risks in respect of the storage, use and disposal phases?	No		
	6.6. Are there respective remaining environmental impacts to consider? (for example:	No		

	odour, spillage, exposure effects, run off, releases to air and combustion potential)				
	7. Whether if Firm C deliberately seeks to produce this material		Yes		
	8. Whether if as a technical choice, it have been left out, and if so, if it was left in		Yes		
	9. Whether, as a technical choice, a decision was made to give the material specific technical characteristics		Yes		
End of Waste	1. Recovery	1.1. Is the substance recovered and used as the raw material in the place of other materials which would otherwise have been used for a particular function?	N/A		
		1.2. Is the waste being used to fulfil a particular function regardless of whether it is replacing raw materials?	N/A		
	2. Is substance or object commonly used for specific purposes?		N/A		
	3. Is there a market or demand for the substance?				
	4. Does the substance fulfil the technical requirements for the specific purposes (in question 2) and does it meet the existing legislation and standards applicable to products?		N/A		
	5. Will the substance lead to overall adverse environmental or human health impacts?		No		

Appendix V

Exclusions from the definition of Waste in the US

Exclusions from the definition of solid waste are as follows:

- Domestic sewage and Mixtures of domestic sewage
- Industrial Wastewater discharges (Point source discharges)
- Irrigation Return flows
- Radioactive Waste
- In-situ Mining Waste
- Pulping Liquors
- Spent sulphuric acid
- Closed-Loop Recycling
- Spent Wood Preservatives
- Coke By-Product Wastes
- Splash condenser dross Residue
- Hazardous Oil-Bearing secondary Materials and Recovered Oil from Petroleum Refining Operations
- Condensates from Kraft Mill steam strippers
- Comparable fuels
- Processed scrap Metal
- Shredded circuit Boards
- Mineral Processing spent Materials
- Petrochemical Recovered Oil
- Spent caustic solutions from Petroleum Refining
- Zinc fertilizers Made from Recycled Hazardous secondary Materials
- Recycling of cathode Ray tubes

Exclusions from the definition of hazardous waste are as follows:

- Household hazardous waste
- Agricultural waste

- Mining overburden
- Bevill and Bensten wastes
 - Fossil fuel combustion waste
 - Oil, Gas, and Geothermal wastes
 - Mining and mineral processing waste
 - Cement Kiln dust
- Trivalent Chromium wastes
- Arsenically treated wood
- Petroleum-contaminated media and debris from underground storage tanks (USTs)
- Spent Chlorofluorocarbon refrigerants
- Used oil filters
- Landfill Leachate or Gas condensate derived from certain wastes

Appendix VI

Descriptive table of the Rules-Based System

Corporate Governance		
1.1	s. 172(1) Companies Act 2006	Section 172 Companies Act should form the basis of a Corporate Governance structure in firms (s. 172 has been drafted broadly but is capable of being interpreted in a way which will help promote business sustainability).
1.2	Transparency	Companies should indoctrinate transparency as an ethical pillar within their overall code of conduct, in line with the spirit of the Companies Act 2006.
1.3.	Disclosure Rules and Procedures	Establish rules and procedures for disclosing as much information as relevant about the extent of environmental impacts of business operations to shareholders and other key stakeholders (i.e. beyond legal compliance on disclosure of information).
1.4	Continuous Improvement	Establish rules and procedures for continuously disclosing full extent (potential and actually) of significant environmental impacts of business operations to board of directors.
1.5	Identify Risks	Identify a series of most serious threats posed to the firm as a result of climate change, appropriate adaptation strategies anticipated, and mechanisms for implementing these steps.
1.6	Self-regulation	Within the board of directors identify (and consider applying) the most stringent regulation (internationally) pertaining to the disclosure of environmental information; compare and contrast extent of disclosure to those disclosure standards, and continue improvements.
1.7	Promote Knowledge Sharing	Promote technology and information sharing within the layers of hierarchy within an organisation.

Environmental Sustainability (water)		
2.1	Incorporate WII	In technical matters pertaining to water, attention to be given to water quality, scarcity and volume, as the most advanced water impact index suggests.
2.2	Efficiency	In water consumption, firms should maintain or enhance the level of efficiency of their manufacturing process.
2.3	Substitution Principle	Firms should in all circumstances attempt to use the best available techniques (BAT) within their manufacturing processes in order to reduce overall water consumption, wastage of water, and to preserve the reservoirs/rivers in which water output is deposited (e.g. closed loop water circulation).
2.4	Scarcity and Manufacturing	Firms should be mindful that their water-intensive manufacturing plants should not be built in water-scarce areas.
2.5	Water and Air Output Quality	Firms should pay special attention to the quality of their water output in terms of its effluent standards and ecological status.
2.6	Direct and Indirect Footprint	Firms should be mindful of the direct and indirect water intensity (Water Footprint) of their resources and products.
2.7	Preventative Principle	Enhancement / Preventative Principle
2.8	Precautionary Principle	In the absence of sufficient scientific and environmental knowledge, the precautionary principle will apply.
2.9	Sustainable Resource Management	Reduce reliance on finite resources over time. During transition to renewable resources, use them sustainably (Do not let renewable resource levels diminish - maximum sustainable yield (allowing for uncertainty, see precautionary principle))

Economic Sustainability		
3.1	Climate Change Financial Risks	In connection with Rule 1.3 and 1.4, to the extent that is financially practicable, minimise all risks posed to business activities from climate change and environmental changes.
3.2	Legal Application Framework	Formulate framework for clarification of legal provisions; the framework should be flexible in nature and facilitate interpretation of the law based on input of qualitative data – see Appendix IV on Waste classification.
3.3	Clarify Applicable Law	Seek clarification of all legal provisions whose aim is to protect human health and the environment from the effects of business operations.
3.4	Direct Dialogue	In terms of waste classifications, given the risks involved in a misinterpretation of the law, firms should consider direct dialogue with EU Member States (or other such municipal regulator).
3.5	Supremacy of Stringent Law	Where legislation (pertaining to waste or any other environmental factor) is less stringent than the rules and procedures set based on Rule 1.3, the internal rules of the firm should prevail.
3.6	Culture of Sharing	Promote technology and information sharing between firms within the same industry and sector.

Social Sustainability

4.1	Human Rights Code of Practice	In conjunction with Rule 1.3, a Code of Practice shall be produced for the benefit of the board of directors. These Codes should adhere to the Universal Declaration of Human Rights as a basic requirement. Local legislation shall prevail subject to imposition of higher standards.
4.2	Training	Ensure all employees and contractor's employees receive adequate training in technical capabilities, health and safety and rescue operations (hard industries). This should include projects conducted internationally.
4.3	Indigenous Communities	Rights of indigenous persons and local communities shall be observed with paramount importance with regards to incumbent manufacturing sites and when considering the feasibility of a project. Where practicable, expropriation rules from the parent company state shall be applied if local legislation is weak in substance or otherwise infringes human rights under international law.
4.4	Effects in the Long Run	Firms shall ensure that the long term effect of a large-scale business operation on the living standards of indigenous persons will be largely positive, or at least have a neutral overall impact. This includes, but is not restricted to, employment, health, education, environmental preservation.
4.5	Introduce and Utilise KPIs Objectively	When reporting on sustainability measures, firms should refrain from acting selectively in the extent to which their report on each criteria (e.g. GRI reporting framework). Furthermore, KPIs should be utilised in the spirit of EU Modernisation Treaty and CA2006 in order to show extent of change in respective criteria from one year to the next.
4.6	Protecting Source of Income	Ensuring a safety of livelihood (protecting those that depend on environmentally harmful industries which will be phased out). The same applies to those whose livelihoods are affected by environmental degradation.
4.7	Community Engagement and Empowerment	Create mechanisms for community empowerment and community scale cooperation.
4.8	Sustainability Education	Promote universal environmental and sustainability education.

Appendix VII

Survey Results for Validation of Results

The results of the survey which was conducted in order to validate and verify the findings of this thesis are provided in this section. All of the surveys have been completed by stakeholders and experts in aspects of sustainability; the stakeholders are professionals who are or have previously been engaged in the following sectors:

- Environmental NGO
- Corporation
 - B2B and B2C
- Government Regulator
 - National
 - Local
 - European
- Academic
- Consumer Organisation
- Consultancy firm
- Employee
 - Corporate Sustainability Director

Expert Analysis of Business Sustainability

Our Department at Imperial College London has carefully selected you as an expert in corporate sustainability responding in your personal capacity. We have spent the past three years conducting research which understands the relationship between corporate success and sustainable management.

As such, the aim of this document is to confirm whether you believe that our findings are right. We have found that firms that apply sustainability practices are more successful in the marketplace.

This survey should take as little as 10 minutes of your time with extra time to be added if you are so interested in respect of drafting comments. Your time is much appreciated in this regard. Kindly direct your responses (which will remain confidential) below. In return, we will also send you the results.

Email: n.orace10@imperial.ac.uk

Telephone: +44(0)79 1421 0190

1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

- ☒ Yes
☐ No
☐ It Depends

Please briefly explain your answer: Firms who go down this path (and most do) make large savings. It is good risk management. And, it offers a side benefit to speak about in public and public policy engagement, although this is not a main reason for going down this path.

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability?

Please tick all that apply

- ☐ Disclosure of information pertaining to the effect of the firms' operation on the environment
☐ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence
☐ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements
☐ Strict advertising standards in order to minimise corporate *greenwashing*
☒ **Other, please explain:** Compliance. Europe has a lot of environmental regulations, and as recent European environment committee hearings show, compliance and enforcement is weak. If the

Commission started enforcing and Member States started real compliance work, we would see real improvement. I don't think there is a need for that many new pieces of law, and we should do a lot more to enforce the rules on the book.

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

- ☒ Yes
☐ No
☐ It depends

Please explain: Profitable firms have high environmental standards. They may not talk about it but in terms of energy conservation, accident minimisation, alternative energy sourcing, lack of waste, the profitable firms I know and work with are best in class.

4. If your answer to Question 3 is "Yes", then this is because of:

Please tick all that apply

- ☐ Mere coincidence
☐ Strategic understanding of customer needs
☒ High quality corporate governance
☐ Sustainability strategy is ultimately profitable in a resource constrained world
☒ Other

Please explain: It makes financial sense. As an aside, I think the environmental movement (of which I was a part) have not sold the case study that being greener is good financial sense.

5. To what extent do you agree with this statement: "In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability"?

- ☐ Always
☐ In most cases
☒ Neither Agree nor Disagree
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: Firms are in business to make profit and they do this by serving their customers. This is not easy to achieve and I don't think firms ever think in terms of those statements.

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you believe that firms see "sustainability" as a rule-based system?

- ☐ Strongly agree
☐ In most cases
☒ It depends on the nature of the business and the firm's sector
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: In the main they do, but more and more see it as normal practice. It is usual business practice as business is in the business of making money and this makes profit...

7. Which corporate attitude do you believe firms generally adopt?

- ☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)
☒ **Reactive** (minimum compliance with the law and sustainability requirements)
☒ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: Some firms meet the legal requirements, which are often set high standards that are hard to achieve and require substantial financial investments. Others are more proactive and build this into their thinking.

8. Please rate the industry sectors below in respect of the classification set out in Question 6, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☐	☐	☒
Mining	☐	☒	☐
Water Management (Utilities)	☐	☒	☐
Banking and Finance	☐	☒	☐

Please elaborate: I have not come across any firms who'd you see as destructive. Perhaps they are not liberal progressive, but they don't do anything to destroy. Some sectors are not particular out there pushing the boat out there, but they are spending a lot on meeting tough regulatory controls and deliver. Personally, I have found the most energy efficient, least wasteful, life cycle thinking firms to be oil and gas. Waste costs profits.

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment: Profit, good business, risk management. The most efficient firm I know (with the highest standards)are: Perstorp, BASF, Exxon-Mobil, Honda, Hitachi

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment: You're going out of business in a year and are trying to get the last piece. Never met them.

You have reached the end of this survey. Thank you very much indeed for your contribution to this research. Your expert opinions and the time you took to provide them are much appreciated.

Expert Analysis of Business Sustainability

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As such, the aim of this document is to confirm whether you believe that our findings are right. We have found that firms that apply sustainability practices are more successful in the marketplace.

This survey should take as little as 10 minutes of your time with extra time to be added if you are so interested in respect of drafting comments. Your time is much appreciated in this regard. Kindly direct your responses (which will remain confidential) below. In return, we will also send you the results.

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1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

- ☒ Yes
☐ No
☐ It Depends

Please briefly explain your answer: because I value the environment and the natural world

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability?

Please tick all that apply

- ☒ Disclosure of information pertaining to the effect of the firms' operation on the environment
☒ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence
☐ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements
☐ Strict advertising standards in order to minimise corporate *greenwashing*
☐ Other, please explain: though, this is not an area that I know a lot about

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

- ☐ Yes
☐ No
☒ It depends

Please explain: It depends, doesn't it? On sector, product, brand, market, regulation, etc. Ideally, both regulation and investment 'norms' would mean that there would be a positive correlation between an firm's environmental and financial performance

4. If your answer to Question 3 is “Yes”, then this is because of:
Please tick all that apply

- ☐ Mere coincidence
☐ Strategic understanding of customer needs
☐ High quality corporate governance
☒ Sustainability strategy is ultimately profitable in a resource constrained world
☐ Other

Please explain: Response linked to my response in Q3

5. To what extent do you agree with this statement: “In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability”?

- ☒ Always
☐ In most cases
☐ Neither Agree nor Disagree
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: [Click here to enter text.](#)

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you believe that firms see “sustainability” as a rule-based system?

- ☐ Strongly agree
☐ In most cases
☐ It depends on the nature of the business and the firm’s sector
☒ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: voluntary commitments and improvements by

progressive firms seem to me to be what drives CSR forward - then regulation / laggards catch up

7. Which corporate attitude do you believe firms generally adopt?

☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)

☒ **Reactive** (minimum compliance with the law and sustainability requirements)

☒ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: I don't know how to answer this - in the UK, more often than not, I think it's proactive or reactive

8. Please rate the industry sectors below in respect of the classification set out in Question 6, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☐	☒	☐
Mining	☐	☒	☐
Water Management (Utilities)	☐	☒	☒
Banking and Finance	☐	☒	☒

Please elaborate: water, finance - reactive / proactive

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment: Ethics, profit, customer loyalty - The Co-operative, M&S, Interface, Unilever

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment: Profit, ignorance, short-termism - pick an oil and gas company of your choice ...

You have reached the end of this survey. Thank you very much indeed for your contribution to this research. Your expert opinions and the time you took to provide them are much appreciated.

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1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

- ☒ Yes
☐ No
☐ It Depends

Please briefly explain your answer: identifiable efforts to be more sustainable and to ensure sustainable growth

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability?

Please tick all that apply

- ☒ Disclosure of information pertaining to the effect of the firms' operation on the environment
☐ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence
☐ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements
☐ Strict advertising standards in order to minimise corporate *greenwashing*
☐ Other, please explain: [Click here to enter text.](#)

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

- ☒ Yes
☐ No
☐ It depends

Please explain: better resilience to water-related risks being an example. Proactive water strategy by allocating CAPEX to mitigate water risks help companies ensure business continuity

4. If your answer to Question 3 is “Yes”, then this is because of:
Please tick all that apply

- ☐ Mere coincidence
☐ Strategic understanding of customer needs
☐ High quality corporate governance
☒ Sustainability strategy is ultimately profitable in a resource constrained world
☐ Other

Please explain: Less vulnerability to financial impacts attached to resources use along the value chain, including the final customers

5. To what extent do you agree with this statement: “In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability”?

- ☒ Always
☐ In most cases
☐ Neither Agree nor Disagree
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: Environment Sustainability should not be dissociated from the growth objectives of a company and thus should be strongly linked to economic performance. In addition, companies focusing on solving social challenges attached to their core business are the one who will be best placed to create shared (financial) value

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you believe that firms see “sustainability” as a rule-based system?

- ☐ Strongly agree
☐ In most cases
☒ It depends on the nature of the business and the firm’s sector

- ☐ **Disagree**
- ☐ **Strongly Disagree**

Please explain why in two or three sentences: Some see it as a game-changer and adopt a proactive attitude to better grow in a sustainable way, e.g. Unilever Sustainable Living Plan, Nestlé Creating Shared Value Program

7. Which corporate attitude do you believe firms generally adopt?

- ☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)
- ☐ **Reactive** (minimum compliance with the law and sustainability requirements)
- ☒ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: depends on market segments and geographies. Those three categories exist but there is a trend to 'Proactive' as companies understand the competitive advantage beyond sustainability

8. Please rate the industry sectors below in respect of the classification set out in Question 7, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☐	☒	☐
Mining	☐	☒	☐
Water Management (Utilities)	☐	☐	☒
Banking and Finance	☐	☒	☐

Please elaborate: Banking and Finance tend to engage but still don't have the right metric to integrate environmental related risks in their ratings.

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment: Ensure competitive advantage and growth, e.g. Unilever and Nestlé

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable

compared to other firms in their industry.

Please comment: Short-terms savings
--

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Email: n.oraeel0@imperial.ac.uk

Telephone: +44(0)79 1421 0190

1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

☒ Yes

☐ No

☐ It Depends

Please briefly explain your answer: It shows a social responsibility within its business ethos

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability?

Please tick all that apply

☒ Disclosure of information pertaining to the effect of the firms' operation on the environment

☐ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence

☐ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements

☐ Strict advertising standards in order to minimise corporate *greenwashing*

☐ Other, please explain: [Click here](#) to enter text.

3. Do you believe that a correlation exists between implementing sustainability measures and

the financial performance of a firm?

☒ Yes

☐ No

☐ It depends

Please explain: There is an obvious cost in implementing sustainability in a business. This is sometimes offset by building credibility with one's customers but unfortunately the 'bottom line' outcome still holds precedence in many markets

4. If your answer to Question 3 is "Yes", then this is because of:

Please tick all that apply

☐ Mere coincidence

☐ Strategic understanding of customer needs

☐ High quality corporate governance

☒ Sustainability strategy is ultimately profitable in a resource constrained world

☐ Other

Please explain: Eventually we would hope for this outcome to be recognised

5. To what extent do you agree with this statement: "In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability"?

☐ Always

☒ In most cases

☐ Neither Agree nor Disagree

☐ Disagree

☐ Strongly Disagree

Please explain why in two or three sentences: Dependant on your market, in Western business areas there is value in promoting the sustainable view, however in other areas this is not important

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you believe that firms see "sustainability" as a rule-based system?

☐ Strongly agree

☐ In most cases

☒ It depends on the nature of the business and the firm's sector

☐ Disagree

☐ Strongly Disagree

Please explain why in two or three sentences: [Click here to enter text.](#)

7. Which corporate attitude do you believe firms generally adopt?

☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)

☒ **Reactive** (minimum compliance with the law and sustainability requirements)

☐ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: [Click here to enter text.](#)

8. Please rate the industry sectors below in respect of the classification set out in Question 7, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☐	☒	☐
Mining	☐	☒	☐
Water Management (Utilities)	☐	☒	☐
Banking and Finance	☒	☐	☐

Please elaborate: [Click here to enter text.](#)

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment: Corporate responsibility, Public and customer perspective. Good examples – Body Shop, Lush

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment: Financial, geographical – no comment

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1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

☒ Yes

☐ No

☐ It Depends

Please briefly explain your answer: if we're talking my own personal choice then I would generally favour a more sustainable firm because sustainability is an issue I care about and I like to reflect that in my decisions. However, if we're talking in business/procurement terms then I would also have to consider things like cost and whether the firm meets other requirements (e.g. health & safety, equal ops, etc.)

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability?

Please tick all that apply

☒ Disclosure of information pertaining to the effect of the firms' operation on the environment

☐ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence

☐ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements

☒ Strict advertising standards in order to minimise corporate *greenwashing*

☐ **Other, please explain:** [Click here to enter text.](#)

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

☐ Yes

☐ No

X It depends

Please explain: It depends on the nature of the firm's business and also the time scale being considered. Some actions may appear to damage profits in the short term but actually help to sustain financial performance in the long term because of a more measured approach to resource extraction, for example.

4. If your answer to Question 3 is "Yes", then this is because of:

Please tick all that apply

☐ Mere coincidence

☐ Strategic understanding of customer needs

☐ High quality corporate governance

☐ Sustainability strategy is ultimately profitable in a resource constrained world

☐ Other

Please explain: [Click here to enter text.](#)

5. To what extent do you agree with this statement: "In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability"?

☐ Always

X In most cases

☐ Neither Agree nor Disagree

☐ Disagree

☐ Strongly Disagree

Please explain why in two or three sentences: From my understanding of sustainability these three are inextricably linked and you cannot have one without the other. However, at the small scale, actions may not always tick all three boxes, e.g. if a firm was considering sponsoring a library it would have a financial cost and it does not bring any environmental benefits would still be worth doing if it brings social benefits to a community.

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you

believe that firms see “sustainability” as a rule-based system?

☐ Strongly agree

☒ In most cases

☐ It depends on the nature of the business and the firm’s sector

☐ Disagree

☐ Strongly Disagree

Please explain why in two or three sentences: [Click here to enter text.](#)

7. Which corporate attitude do you believe firms generally adopt?

☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)

☒ **Reactive** (minimum compliance with the law and sustainability requirements)

☐ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: Firms don’t act altruistically: their purpose is to maximise profits and for many of the large global industries the financial rewards of behaving destructively hugely outweigh the risks. However, I like to think that taking into account all firms, large & small, local & global, the risk of punishment (legal and in terms of negative portrayal by customers) dissuades most of them from adopting a destructive mentality.

8. Please rate the industry sectors below in respect of the classification set out in Question 7, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	X	☐	☐
Mining	X	☐	☐
Water Management (Utilities)	☐	X	☐
Banking and Finance	X	☐	☐

Please elaborate: Global extractive industries tend to be distanced from any negative consequences of their actions, both geographically and in terms of the global supply chains. E.g. when you buy a mobile phone it’s very difficult to trace where the raw materials come from – if you want to boycott a destructive mining company that’s extracting cadmium it’s pretty difficult. Without this direct consumer link there is little incentive for firms to act sustainably. The banking & finance industry, although not an extractive industry in the traditional sense, has a similar impact in that it directly benefits from something that negatively impacts its customers (‘bad debt’ rather than pollution in this case). I’m giving water companies the benefit of the doubt, because a more sustainable approach to management is perhaps more likely to benefit the company, e.g. saving water in the winter could help

secure supply in the summer.

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment: Legal requirement, Good PR, customer base, i.e. use sustainability as their USP

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment: Financial disbenefits: acting sustainably often costs money in the short term, e.g. for R&D, for cleaning up a site, etc.

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1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

☒ Yes
☐ No
☐ It Depends

Please briefly explain your answer: Click here to enter text. *Yes, especially if it is sacrificing higher return options in favour of more sustainable ones. I am very wary of greenwashing.*

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability?

Please tick all that apply

☒ Disclosure of information pertaining to the effect of the firms' operation on the environment
☐ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence
☒ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements
☒ Strict advertising standards in order to minimise corporate *greenwashing*
☐ Other, please explain: Click here to enter text.

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

- ☐ Yes
☐ No
☒ It depends

Please explain: Click here to enter text. *Unless firms are forced into compliance with regulation aimed at sustainability, I see few markets where the sustainable option is the more profitable.*

4. If your answer to Question 3 is "Yes", then this is because of:

Please tick all that apply

- ☐ Mere coincidence
☒ Strategic understanding of customer needs
☐ High quality corporate governance
☐ Sustainability strategy is ultimately profitable in a resource constrained world
☐ Other

Please explain: Click here to enter text.

5. To what extent do you agree with this statement: "In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability"?

- ☐ Always
☐ In most cases
☒ Neither Agree nor Disagree
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: Click here to enter text. *I think it is likely to be too much to expect firms to focus on anything except the economic bottom line unless there are legal responsibilities to do so. Environmental performance is most frequently enabled by changing the boundaries of the market to influence how profits can legally be maximised!*

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you believe that firms see "sustainability" as a rule-based system?

- ☐ Strongly agree
☒ In most cases
☐ It depends on the nature of the business and the firm's sector
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: Click here to enter text.

7. Which corporate attitude do you believe firms generally adopt?

- ☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)
- ☒ **Reactive** (minimum compliance with the law and sustainability requirements)
- ☐ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: Click here to enter text. *Depends if the firm is a technology user or a technology developer.*

8. Please rate the industry sectors below in respect of the classification set out in Question 7, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☐	☒	☐
Mining	☐	☒	☐
Water Management (Utilities)	☐	☒	☐
Banking and Finance	☐	☒	☐

Please elaborate: Click here to enter text. *Depends on the region and company. Firms are not generally intentionally illegal but will exploit loopholes and greenwash when it's profitable. They will also act to keep requirements as low as possible, unless they have a competitive advantage at a higher requirement level.*

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Need to define "Sustainable"!

Please comment: Click here to enter text. *Gain market share among sustainability-aware customers. Push the market in a direction where the firm has a competitive advantage. Because the firm is in a sector that is inherently more sustainable. Because of regulation or market rules.*

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment: Click here to enter text. *The lowest cost production route for products demanded by consumers is often less sustainable, in the absence of regulation or markets that internalise externalities. More sustainable practices often have longer payback times than competing investments. Lack of internal controls and procedures within large companies.*

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1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

- ☒ Yes
☐ No
☐ It Depends

Please briefly explain your answer: If those identifiable efforts are authentic moves towards sustainability, whatever that means, I believe that companies should be rewarded (“favoured”). In a capitalist market power derives in part from the financial resources that a firm can bring to bear in relation to its value proposition and so by choosing to reward a company by purchasing its products (or recommending them, another sources of power) then we, in effect, restrict the power that other companies that might not be making efforts in sustainability have.

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability?

Please tick all that apply

- ☐ Disclosure of information pertaining to the effect of the firms’ operation on the environment
☐ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence
☐ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements

☐ **Strict advertising standards in order to minimise corporate *greenwashing***

☒ **Other, please explain:** I don't believe that any of these will make a real impact in progressing sustainability. A reliance on disclosure of information (as described in the first 3 points) in an attempt to frame sustainability as a neo-classical economic issue. Here, we argue that by having more or full access to information then we can make better or perfect decisions. It assumes that people will make the "right" decision when presented with that information, but we know that this isn't the case. It says nothing about the reality of decision making – the mechanisms by which people make decisions. The fourth point is somewhat related if we describe "greenwashing" as a consequence of power wielded to hide information or misdirect people from the what's really going on, but again we have to understand how people act if they were given the right information.

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

☒ **Yes**

☐ **No**

☐ **It depends**

Please explain: Sure – we can derive correlations from anything given a selective choice of data points. A more interesting question would be whether there's a causal link between the two. This is far more difficult to prove, as has been shown by the published studies that report +ve, -ve or ambiguous coupling.

4. If your answer to Question 3 is "Yes", then this is because of: Please tick all that apply

☒ **Mere coincidence**

☐ **Strategic understanding of customer needs**

☐ **High quality corporate governance**

☐ **Sustainability strategy is ultimately profitable in a resource constrained world**

☐ **Other**

Please explain: explained above.

5. To what extent do you agree with this statement: "In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability"?

☐ **Always**

☐ **In most cases**

☐ **Neither Agree nor Disagree**

☒ **Disagree**

☐ **Strongly Disagree**

Please explain why in two or three sentences: Firms should consider each of those dimensions in their decision making. Whether they give each of the “equal weight” is another matter. You would have to look at what you mean by “equal”, by “weight”, at the relevance of each sector and at each individual firm. I don’t think that you can move from the general to the specific easily unless you reframe the question.

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you believe that firms see “sustainability” as a rule-based system?

- ☒ **Strongly agree**
☐ **In most cases**
☐ **It depends on the nature of the business and the firm’s sector**
☐ **Disagree**
☐ **Strongly Disagree**

Please explain why in two or three sentences: I believe most firms treat CSR and sustainability as rule-based. However, I do believe that “rules” need to include normative expectations i.e. there may not be a legally enforceable rule that forces firms to report sustainability performance, but there are normative pressures from e.g. NGOs (e.g. CDP) and pressure groups.

7. Which corporate attitude do you believe firms generally adopt?

- ☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)
☒ **Reactive** (minimum compliance with the law and sustainability requirements)
☐ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: In general I don’t believe that firms have to resources (capital, labour, knowledge) to be proactive. In terms of market rational, going beyond compliance implies that there are rewards to be gained from doing so. Reputational rewards from sustainability efforts are low.

8. Please rate the industry sectors below in respect of the classification set out in Question 7, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☒	☐	☐
Mining	☐	☒	☐
Water Management (Utilities)	☐	☒	☐
Banking and Finance	☒	☐	☐

Please elaborate: O&G – drilling in the Arctic and no future safeguards against spills demonstrates that neither they nor governments have learnt much from Deepwater Horizon. Mining: making efforts, especially in efforts to remediate damage and develop capabilities in local areas. However, still reactive as have been forced to do so by NGOs. Water management: I don't really see any proactive behaviour – most are reacting to future climate change projections in some way. Banking: making no real effort at all, and in large part being obstructive of reforms, despite the crash and public opinion. However, the public haven't really done much other than complain – it would be interesting to find out how many people moved bank accounts to e.g. Triodos or Cooperative after the scandals broke.

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment: ethics; reacting to future projections (including intergenerational equity) to sustain firm profits. Vitsoe, Adnams, 7th Generation, Ecover, Unilever/John Lewis/M&S to an extent (still sell too much stuff)

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment: because it's the rational thing to do given short term market signals.

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1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

- ☐ Yes
- ☐ No
- ☒ It Depends

Please briefly explain your answer:

Depends on how what you mean by "favour". As a consumer I probably would, to the extent that any premium in price is not excessive according to my preferences. As an investor, sustainability would probably be a secondary concern, and my focus would probably be on financial performance.

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability?

Please tick all that apply

- ☒ x Disclosure of information pertaining to the effect of the firms' operation on the environment
- ☐ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence
- ☐ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements
- ☒ x Strict advertising standards in order to minimise corporate *greenwashing*

☐ **Other, please explain:** [Click here to enter text.](#)

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

- ☐ Yes
☐ No
☒ It depends

Please explain: [Click here to enter text.](#)

The question in my opinion is whether a correlation suggests anything meaningful in this case. A simple example is the following: say sustainability and performance are correlated. Do sustainable firms perform better, or firms that perform better can afford sustainable practices? Finding out in which direction the causality runs is in my opinion more important relative to uncovering the correlation. Overall, yes, I believe a correlation is possible there, but I cannot evaluate what this means.

4. If your answer to Question 3 is “Yes”, then this is because of:

Please tick all that apply

- ☒ Mere coincidence
☒ Strategic understanding of customer needs
☒ High quality corporate governance
☒ Sustainability strategy is ultimately profitable in a resource constrained world
☒ Other

Please explain: [Click here to enter text.](#)

I cannot tell. Most probably all factors at play at the same time.

5. To what extent do you agree with this statement: “In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability”?

- ☐ Always
☐ In most cases
☒ Neither Agree nor Disagree
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: [Click here to enter text.](#)

Again this depends on which hat one puts on. As a person with research interests in the environment I would believe that a holistic approach in sustainability is necessary. However one can always think of exceptions where environmental sustainability may be ignored

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you

believe that firms see “sustainability” as a rule-based system?

- ☐ Strongly agree
- ☐ In most cases
- ☐ It depends on the nature of the business and the firm’s sector
- ☐ Disagree
- ☐ Strongly Disagree

Please explain why in two or three sentences: [Click here to enter text.](#)

7. Which corporate attitude do you believe firms generally adopt?

- ☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)
- ☒ **Reactive** (minimum compliance with the law and sustainability requirements)
- ☐ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: [Click here to enter text.](#)

Unless pressure from consumers is applied it is unlikely that firms would voluntarily change their practices (given substantial costs of transition). Furthermore, regulations are often the result of lobbying process. Therefore firms’ willingness to implement sustainable practices may already be reflected in existing legislation.

8. Please rate the industry sectors below in respect of the classification set out in Question 7, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☐	☒	☐
Mining	☐	☒	☐
Water Management (Utilities)	☐	☒	☐
Banking and Finance	☐	☒	☐

Please elaborate: [Click here to enter text.](#)

I don’t believe that for the majority of firms proactive behaviour is feasible. In my opinion the majority acts to satisfy the absolute minimum of regulation.

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment: [Click here to enter text.](#)

Advertising, Regulation, Cost

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment: [Click here to enter text.](#)

Cost, Habit, Traditionalism

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1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

- ☒ Yes
- ☐ No
- ☐ It Depends

Please briefly explain your answer: Any firm who isn't engaged in the agenda will also be asleep to other realities in their industry/supply chain/client base and is therefore at risk of being unprepared for a rapidly changing business environment. They will be left behind/become obsolete.

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability? Please tick all that apply

- ☒ Disclosure of information pertaining to the effect of the firms' operation on the environment
- ☒ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence
- ☒ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements
- ☒ Strict advertising standards in order to minimise corporate *greenwashing*
- ☐ Other, please explain: [Click here to enter text.](#)

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

- ☒ Yes
☐ No
☐ It depends

Please explain: Judicious use of company resources to address corporate impact in a strategic manner ultimately repositions the firm in the business environment, in a sense future-proofing early against changes which will inevitably be demanded. By acting proactively and prudently, the expenditure can be included in R&D and innovation cycles and actually save firms “clean-up costs” imposed on it.

4. If your answer to Question 3 is “Yes”, then this is because of:
Please tick all that apply

- ☐ Mere coincidence
☐ Strategic understanding of customer needs
☐ High quality corporate governance
☒ Sustainability strategy is ultimately profitable in a resource constrained world
☐ Other

Please explain: Understanding the new reality of the state of the world, particularly resource constraints and over-harvesting of ecosystem services, is a pre-requisite to repositioning business to survive and thrive. It is not mere coincidence, nor is it an understanding of customer needs (because customers don’t demand how you deliver products and services, they demand the fulfilment of their own needs), and nor is it driven by high quality corporate governance – this is a necessary, but not sufficient pre-condition.

5. To what extent do you agree with this statement: “In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability”?

- ☐ Always
☐ In most cases
☒ Neither Agree nor Disagree
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: This question misses the point. It’s not about trading off between 3 separate objectives, but rather spending resources on changes that advance all three simultaneously. The problem with framing the question this way is that you are already reducing possibilities to either/or versus opening up to creative solutions that move the whole firm forward. Weight should be given to measures that move towards all of the above, maintain flexibility for the firm and represent a good return on investment (so that you can continue to take further measures). A

framework for strategic sustainability (principle- rather than rule-based) already exists and has been in operation in firms for over 20 years now, and each of these organisations are leading the way in their sectors.

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you believe that firms see “sustainability” as a rule-based system?

- ☐ Strongly agree
- ☐ In most cases
- ☒ It depends on the nature of the business and the firm’s sector
- ☐ Disagree
- ☐ Strongly Disagree

Please explain why in two or three sentences: Firms who see sustainability as a rule-based system tend to just be following the letter of the law or the current market demand for minimum criteria to be met – so reactive to external drivers. Firms who see sustainability as a new understanding of reality see it as a values-based system – do we want to be part of the future, if so, then we need to take care of our impact and be part of proactively creating new markets and new ways of meeting our needs through new ways of delivering value and addressing impacts.

7. Which corporate attitude do you believe firms generally adopt?

- ☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)
- ☒ **Reactive** (minimum compliance with the law and sustainability requirements)
- ☐ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: Most firms are currently preoccupied with surviving the current economic reality. That said, during this downturn, many firms are “getting their heads around” understanding sustainability more deeply, which may see more firms switch to becoming proactive players.

8. Please rate the industry sectors below in respect of the classification set out in Question 7, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☒	☒	☐
Mining	☒	☒	☐
Water Management (Utilities)	☐	☐	☒
Banking and Finance	☐	☐	☒

Please elaborate: My perception is that firms operating within the Oil & Gas and Mining sectors fall into two categories – the big names are broadly reactive with a few proactive leaders, while the lesser known names operating particularly in developing countries are broadly destructive. Likewise, firms operating in water management have an incentive to be proactive because of the precious nature of water, and more recently, firms operating in the banking and finance sector are adopting a proactive stance as they are removed from direct impacts and can therefore have massive influence on the supply chain.

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment:

- (1) It's the right thing to do. We live in an interconnected world where if we don't do it, we all suffer. Firms that get this, build it into their brand values and get on with the job of realigning their business. Examples include but not limited to M&S Plan A, Unilever Sustainable Living Plan, Interface Mount Sustainability, Patagonia etc.
- (2) It's a catalyst for innovation. All firms in every sector have impacts. The rules of the game are changing, rapidly, and forever. Firms who realign their products and services with fundamental principles of how Nature operates will thrive into the future. Firms who understand this are using the crisis as an opportunity to redefine their marketplace and gain first mover advantages.
- (3) It's only a matter of time. We are fast approaching a situation where impacts will no longer be tolerated, by communities where they occur, by regulators, and by consumers. Firms which are left behind will be forced to close because they haven't invested in change early enough.

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment:

- (1) Me first, then we. Firms in this category focus on building enough revenue and then plan to give back when they feel they can afford to – the philanthropic approach.
- (2) Race for cash. Firms in this category focus on winning the financial race – to hell with everything else. It's someone else's problem.
- (3) Power play. Firms in this category focus on accumulating rights to resources the world over, positioning for the scenario where we are all in conflict for resources. This is where business becomes political.

You have reached the end of this survey. Thank you very much indeed for your contribution to this research. Your expert opinions and the time you took to provide them are much appreciated.

Expert Analysis of Business Sustainability

Our Department at Imperial College London has carefully selected you as an expert in corporate sustainability responding in your personal capacity. We have spent the past three years conducting research which understands the relationship between corporate success and sustainable management.

As such, the aim of this document is to confirm whether you believe that our findings are right. We have found that firms that apply sustainability practices are more successful in the marketplace.

This survey should take as little as 10 minutes of your time with extra time to be added if you are so interested in respect of drafting comments. Your time is much appreciated in this regard. Kindly direct your responses (which will remain confidential) below. In return, we will also send you the results.

Email: n.orace10@imperial.ac.uk

Telephone: +44(0)79 1421 0190

1. On balance, would you favour a firm that is making identifiable efforts to be more sustainable?

- ☒ Yes
☐ No
☐ It Depends

Please briefly explain your answer: I would be simply more confident in an organization which takes into account future environmental and social stakes and constraints in its strategy and business development. This is true as an employee, shareholder, customer or provider of this firm.

2. It is often believed that environmental performance should be stronger. Which aspects of Environmental Law do you believe are essential for advancement of Corporate Environmental Sustainability? Please tick all that apply

- ☒ Disclosure of information pertaining to the effect of the firms' operation on the environment
☐ Shareholder rights in order to legally demand stronger adherence to corporate social responsibility and environmental adherence
☐ Clarify current environmental regulations in order to avoid confusion about the extent of relevant requirements
☒ Strict advertising standards in order to minimise corporate *greenwashing*
☐ **Other, please explain:** Disclosure is key and makes progressively the market rise in terms of practices through benchmarking and duplication. Standards are necessary to ensure a minimum level

of involvement of firms.

3. Do you believe that a correlation exists between implementing sustainability measures and the financial performance of a firm?

- ☐ Yes
☐ No
☒ It depends

Please explain: It depends on the temporality and on the benefits/concerns we consider. On the short term, sustainability can be synonymous of low profitability (pay-back too long), especially if all benefits are not included in the ROI calculation (environmental and social benefits for instance). On the contrary, considering a long term vision, sustainability measures should be much more beneficial in financial performance. Much people see the long term as a “row” of short term periods... The role of any CEO is to adopt the “spyglass” vision, ensuring a strong stand for the future development of the firm, in other words considering also long pay-back as strategic for the firm and progressively integrate externalities in financial decisions (environmental and social direct and indirect impacts).

4. If your answer to Question 3 is “Yes”, then this is because of:
Please tick all that apply

- ☐ Mere coincidence
☐ Strategic understanding of customer needs
☐ High quality corporate governance
☐ Sustainability strategy is ultimately profitable in a resource constrained world
☐ Other

Please explain: [Click here to enter text.](#)

5. To what extent do you agree with this statement: “In general, firms should give equal weight to each of Environmental, Social and Economic Sustainability”?

- ☒ Always
☐ In most cases
☐ Neither Agree nor Disagree
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: I would say “always” in the sense that those 3 pillars of sustainability are all linked and correlated... considering a long term period. The equilibrium of those 3 axes ensures sustainability.

6. A rule-based system can comprise anything from legally binding requirements to market-based signals (i.e., recycle waste / save energy) with which firms seek to comply. Do you believe that firms see “sustainability” as a rule-based system?

- ☐ Strongly agree
☐ In most cases
☒ It depends on the nature of the business and the firm’s sector
☐ Disagree
☐ Strongly Disagree

Please explain why in two or three sentences: B2B or B2C markets are for instance at a different level of maturity regarding this question. Hard regulation concerns more heavy industry where environmental impacts are huge. Generally speaking, the sustainability pressure is emerging from the downstream side of the value chain (final customers, users) and is going back on the chain up to the fields and mines (agriculture and heavy industry for 1st transformation). In the B2C sectors, sustainability is seen as a differentiation factor from the competition... avoiding “greenwashing”!

7. Which corporate attitude do you believe firms generally adopt?

- ☐ **Destructive** (non-compliance with established rules, for example by acting illegally, occasionally exploiting regulatory loopholes, or greenwashing in respect of sustainability and corporate social responsibility)
☐ **Reactive** (minimum compliance with the law and sustainability requirements)
☒ **Proactive** (beyond compliance with law and generally accepted sustainability standards, i.e., firms who help to set new benchmarks in their industry with respect to sustainability)

Please elaborate: [Click here to enter text.](#)

8. Please rate the industry sectors below in respect of the classification set out in Question 7, according to your perception of such markets.

Global Industries	Destructive	Reactive	Proactive
Oil and Gas	☐	☒	☐
Mining	☒	☐	☐
Water Management (Utilities)	☐	☐	☒
Banking and Finance	☐	☒	☐

Please elaborate: [Click here to enter text.](#)

9. What are the (up to) three principal reasons for conducting business in a sustainable manner? Please provide examples of any firms who you believe to be at the apex of sustainability efforts.

Please comment: In order to maximize the probability to exist still on the market in 15 years, the firm has to conduct its business in a sustainable manner for 3 main reasons: be sure to still have resources and raw material to product its products or services; be sure to work with the right providers / partners on a shared long term vision; be sure to keep internal competences and be attractive for new employees. Examples : Veolia, Danone, Nestlé, Innocent, etc.

10. What are the (up to) three principal reasons for conducting business in an unsustainable manner? Please provide examples of any firms who you believe to be the least sustainable compared to other firms in their industry.

Please comment: Shareholders pressure for short term revenues; difficulty to change the business model (how to manage the transition!); not enough pressure form regulation (lobbying).

You have reached the end of this survey. Thank you very much indeed for your contribution to this research. Your expert opinions and the time you took to provide them are much appreciated.

Appendix VIII

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Friday, 27 September 2013 08:58:21 British Summer Time

Subject: AW: Report for Education and Research

Date: Monday, 15 April 2013 08:55:31 British Summer Time

From: Alessandra Oglino

To: Oraee-Mirzamani, Nikzad

Dear Nikzad,

Thanks for your interest in RepRisk.

In the frame of our Academic Policy, we are happy to support PhD students by providing information on the companies and projects we monitor. I can therefore send you our Company Reports on Rio Tinto and Veolia Environment.

Our Company Reports are a compilation of all information collected by RepRisk since January 2007, you can find more information here: <http://www.reprisk.com/repriskcompanyreports/>

Feel free to use these reports for your research and teaching purposes.

Thanks for citing RepRisk as the source of your information.

Should you have any further questions on our methodology or our work, do not hesitate to contact me.

Kind regards,

Alessandra

Von: Oraee-Mirzamani, Nikzad [mailto:n.oraee10@imperial.ac.uk]

Gesendet: Freitag, 12. April 2013 19:18

An: 'contact@reprisk.com'

Betreff: Report for Education and Research

Dear Sirs,

I am contacting you from Imperial College London, Centre for Environmental Policy, where I am currently engaged with completing my PhD thesis.

I am interested in risk reports for Rio Tinto and Veolia Environment (Water, Waste, Energy and Transport).

I would like to know whether if RepRisk provides a student/educational promotion scheme? This is where your material would be used solely for educational purposes, will by no means be distributed or reproduced, and where the information contained in your report are referred to, RepRisk will be duly cited.

I would be grateful for your response at your earliest convenience.

Many thanks,

Nikzad

Khorasan Gypsum Plc

Founded 1955

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30 August 2013

TO WHOM IT MAY CONCERN:

I hereby confirm that I have been in contact with Mr Nikzad Oraee-Mirzamani regarding his PhD research project and have disclosed information about the operations of Khorasan Gypsum Ltd. I also confirm that permission is granted to Nikzad for the unrestricted use of photographic material which may be subject to copyright and intellectual property regulations for the purposes of his academic research activities and for publication in his final PhD thesis, provided that said photographs are correctly attributed to Khorasan Gypsum Ltd.

Khorasan Gypsum Ltd actively pursues opportunities to contribute to academia as well as social and sports activities within local communities.

Please do not hesitate to contact us should you require any further information.

Sincerely yours,



Seyed Jalal Hosseini Panah

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- The End -