SUSTAINABILITY PERFORMANCE MEASUREMENT: AN INVESTIGATION INTO CORPORATE BEST PRACTICES

Karun Kumar

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Karun Kumar

School of Public Administration

Assistant Professor ..... Major Advisor

(Pairote Pathranarakul, Ph.D.)

The Examining Committee Approved This Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy (Development Administration).

Associate Professor..... Committee Chairperson

(Preecha Jarungkitanan, Ph.D.)

Assistant Professor..... Committee

(Amornrat Apinunmahakul, Ph.D.)

Assistant Professor ..... Committee

(Pairote Pathranarakul, Ph.D.)

Professor..... Dean

(Nisada Wedchayanon, Ph.D.)

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ABSTRACT

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The concept of sustainable development has emerged as a key guiding principle and action agenda for all forms of environmental management, economic development and social justice. The much professed "triple bottom line" TBL (Financial, Social, and Environmental) has its proponents and detractors who argues whether holding corporations accountable to economic prosperity, social justice, and environmental quality, constitutes progress. International businesses often have improved performance when they include their social, ethical and environmental responsibilities in business planning–their corporate and social responsibility. The "value" concept and sustainability is all the more relevant today when the world economy is reeling in deep economic crisis.

This research is an attempt to explore and explain Sustainability Performance Measurement (SPM) based on environmental values and indicators (Energy, Water, Emission, Waste and Recycling) that is measuring the immeasurable and that has implications and consequences for corporate governance in particular, and more generally for the economy, business and society. It is an attempt to find the gap and get the insight of corporate intentional and consequential actions within and beyond regulatory framework. This study assessed five environmental indicator measurements of 80 corporations using the sustainable value approach. The objectives of the study are to examine forces and explore factors that shape the strategic initiative for sustainability performance and compare sustainability performance evaluation and practices of corporation within Economic, Social and Environmental dimensions.

The study used a qualitative approach, using a mix investigative and content analysis as research strategy to develop insight into sustainability performance measurement practices of Corporations. The scope of this study extended to large number of Corporations leading in sustainability practices and not limited to any geographical region.

The study found significant inconsistencies and gaps among company data undermining the comparability of this information as Corporations approach reporting in differing ways. This is of importance to policy making, lack an accurate picture of the landscape, particularly acute in areas such as climate change, that are of rapidly increasing importance in terms of value creation and integration. The issue of sustainability poses a value proposition that is inflicted by a measurement challenge.

The challenge is to redefine the conventional economic system that is designed to avoid paying for any external (environmental and social) cost. The paradigm shift would require harnessing the financial firepower of global corporations to create a robust incentive structure and integrated approach through value creation. A strategic model is proposed for value creation and effectively measuring in integrated sustainability performance.

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Karun Kumar

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TABLE OF CONTENTS

LIST OF TABLES

Tables **Page**

LIST OF FIGURES

Figures **Page**

CHAPTER 1

INTRODUCTION

"If you can't measure it, you can't manage it" Peter Drucker

1.1 Background

The beginning of 21st century ushered in a new era in corporate strategy and management towards sustainable thinking. The concept of sustainable development has emerged as a key guiding principle and action agenda for all forms of environmental management, economic development and social justice. The much professed "triple bottom line" (TBL: Financial, Social, and Environmental) (Elkington, 1999) has its proponents and detractors who argues whether holding corporations accountable to economic prosperity, social justice, and environmental quality, constitutes progress.

The emergence of sustainability in its contemporary form stems from the UN's creation in 1983 of The World Commission on Environment and Development (WCED), headed by former prime minister of Norway, Gro Harlem Brundtland. The most acceptable quote from the Brundtland report defined sustainable development as **"development that meets the need of the present generation without compromising the ability of future generations to meet their needs"**

Corporations around the world are struggling with a new role entrusted upon them in form of Corporate Social Responsibility (CSR). Amato et al. (2009) concludes in a comprehensive study that organizations are being called upon to take responsibility for the ways their operations impact societies and the natural environment. They are also being asked to apply sustainability principles to the ways in which they conduct their business.

The main catalyst for the importance to concept of sustainability was the Rio de Janeiro Earth Summit held in 1992. The Rio summit agreed to set of action points

for sustainable development, collectively referred to as Agenda 21, and 172 signatory governments committed them to action. In order to help put these points into practice, the summit established a mandate for the United Nations to establish a set of 'indicators of sustainable development' that will help monitor progress. Bell and Morse (2010) explains that the idea of using indicators as a means of gauging extremely popular with many governments and agencies devoting substantial resources to indicator development and testing.

Edwards (2009) links sustainability to natural eco-system and profess that sustainability revolution encourages business practices to mimic natural system. The industrial ecology perspective applies to the efficient design of products and services and the elimination of waste. Sustainable business practices are becoming recognized as essential not only for corporate survival but also for the long-term health of the planet.

Clifton and Amran (2011) explores the concept of contemporary sustainability dating back from 1880s of its emergence in response to environmental damages caused post industrial revolution and "the subsequent progression of environmental through to the advent of the modern day environmental movement in the 1960s". They further establish the fact that in its original form, "sustainability was closely associated with maintenance of environmental quality, though the term is so multifaceted-the origins of sustainability are complex. Concerns about the need for humans to live sustainably (i.e. for there to be a sustainable world – also referred to as sustainability) have historical roots dating back thousands of year".

Epstein (2008) argues that Corporations today have become more sensitive to social issues and stakeholder concerns and are striving to become better corporate citizens. Whether the motivation is concern for society and the environment, government regulation, stakeholder pressures, or economic profit, the result is that managers must make significant changes to more effectively manage their social, economic and environmental impacts. As companies search for ways to improve their performance, determining the best ways to thoroughly integrate these improvements into all parts of the organization still presents challenges. These challenges are because "implementing sustainability is fundamentally different than implementing other strategies in the organization it is only through the identification, measurement

and management of sustainability impacts that social, environmental and financial performance can be improved and value created".

Paine (1994) had argued that organizational integrity is based on an organization's guiding values - an environment that supports ethically sound behavior and instills a sense of shared accountability among employees. An integrity strategy is broad (it seeks to enable responsible conduct), deep (it cuts to the ethos and operating systems of the organization and its members, their guiding values and patterns of thought and action), and demanding (it requires an active effort to define the responsibilities and aspirations that constitute an ethical company). Organizational ethics is the task of leadership. The corporate counsel designs and implements integrity strategies and managers at all levels and across functions are involved in the process.

Corporations, however, are being seen as the catalyst to play leading role in this model. Bakan (2004) noted that over the last 150 years the corporations have risen from relative obscurity to become the world's dominant economic institution. Today, they govern our lives and we are inescapably surrounded by their culture, iconography and ideology.

The climate change scenario, Intergovernmental Panel on Climate Change (IPCC) report, rapid but uneven population, global economic growth and interdependence/ globalization and major economic collapse of 2008 & 2011, unprecedented natural disasters around the globe are some major indicators being argued as signs of unsustainable world order. There is a greater call for built in self-regulating mechanism where business would monitor and ensure its adherence to law, ethical standards and international norms.

Despite the documented bad behaviors of corporations, UN Global Compact initiative found that today's globalized society is engaged in a race to better standards for corporate behavior, not worse. As more companies emerge as global players, it will become evident that principled corporate behavior is essential to winning business strategy for emerging-market TNCs. (Hall, 2007).

The Environmental Tracking (ET) scores the world's largest companies by their GHG emissions intensity, whilst factoring in different levels of disclosure and verification. Their aim is to create a 'spotlight effect', drawing attention to the state of

corporate emissions, and to place a dynamic pressure upon companies to lower their emissions and improve their positioning relative to their peers. Given the large emphasis companies place on image and reputation, no company wants to be at the bottom of global carbon ranking for failing to disclose any information (Gill, 2011).

Equally important for the corporations to thrive and profit in this new world order is to take lead Piasecki (2007) found in his study that as power moves into the hands of business, the world is increasingly looking to corporations instead of government or religion to solve its problems in solving social and global problems. Businesses now are more capable and powerful than government. The astonishing increase in the size and logistical scope of a few key companies defines today's corporate world - for with new levels of wealth and power come new possibilities and responsibilities for social change.

1.2 Rationale of the Study

Sustainability and Corporate Social Responsibility (CSR) are intertwined and one of the most pressing issue faced by global community in contemporary world. While the issue is global, Corporations have to adopt appropriate strategies to suit to the local environment with a balanced option. The big picture demands localized solutions for ultimate global outcome.

Paine (2003) argues that ethics is an important corporate concern and “values are a critical success factor in today’s business world.” Further, corporate values are constantly shifting because of several factors. Fukukawa et al., (2007) explains that corporate identity reflects “what a company really is,” rather than what a company might espouse. Ethicanization refers to an encapsulation of CSR, ethics, and corporate identity. Although this value aspiration (D’Amato, Henderson & Florence, 2009) of many corporations to contribute to a better world is great, translating that aspiration into reality proves to be somewhat of a challenge. The concept of sustainability is now seen as desirable; and the debate is about how to deliver on that and how to make it work in practice.

The “value” concept and sustainability is all the more relevant today when the world economy is reeling in deep economic crisis. The post-world war II era that

brought end of great depression and subsequently, governments spent lots of money producing large unsustainable economies and in fact destroying lots of value in terms of sustainability. Today the need is to have globally shared efforts rebuilding a sustainable model for progress and because the share of corporate sector in economy is so substantial, it is important they play vital role in achieving sustainability.

Businesses with ethical behavior gain widespread community approval and unethical businesses will eventually be publicly criticized and may be penalized by government regulators in both their domestic and international markets. International businesses often have improved performance when they include their social, ethical and environmental responsibilities in business planning and their Corporate Social Responsibility. Therefore, it is important to study sustainability practices and performance measurement of the organizations.

This research will investigate Sustainability performance measurement (SPM) based on values that is measuring the immeasurable and beyond compliance and reporting. In other words, this research is an attempt to find the gap and get the insight of corporate intentional and consequential actions beyond regulatory framework.

1.3 Research Objectives

This study will investigate sustainability performance measurement practices used by international companies in global environment. Specific objectives of this research are:

1) To examine forces and explore factors that shapes the strategic initiative for sustainability performance.

2) To examines the relationship of market environment, stakeholders, resources, and values to the development of sustainability strategies.

3) To compare sustainability performance evolution and practices of corporation (including case studies) within Economic, Social and Environmental dimensions and analyze Environmental Indicator Data (Energy, Water, Emission, Waste, and Recycling).

4) To propose a strategic model for effectively measuring long-term sustainability performance.

1.4 Scope and Limitations of the Study

The research study firstly focused in the sustainability performance measurement of corporations. For this study a corporation is defined to include a firm that operates in more than one country at a time, also called Transnational Corporation (TNC) or Multinational Corporation (MNC). A total of 80 corporations, not limited to any geographical region were included in this study as representatives of global corporation. The scope in this study focused on strategic initiatives including forces and factors influencing sustainability performance measurement of corporations and disclosure frameworks and guidelines. The study covers data for period of seven years i.e., from 2006-2012. The performance measurement in this study were five vital environmental indicators, which are Energy, Water, Emission, Waste and Recycling measurement data.

The first limitation is related to the performance measurement outcome. Due to the nature of strategic initiatives that focus on triple bottom line (Economic, Social and Environmental) it is difficult to link strategic implementation of corporations to specific and limited environmental indicator outcomes of this study. The best performing corporations on this outcome cannot be judged as overall best performing corporations. A company facing range of challenges may adopt sustainability practice compared to a company with less impact. This can result in companies with most significant impact rating as the best performers.

The second limitation is the dynamic nature of sustainability measurement framework which is global in nature and constantly being driven by evolving principles, guidelines, framework, regulation and industry practices, both voluntary and mandatory. Most reporting and analysis tends to focus on process issues currently, rather than actual performance and impact. It is hard to determine from sustainability reports, a full picture of organizations social and environmental impact. Their communications demonstrate engagement with their wider responsibilities, but not always providing concrete comparable data on social or environmental performance.

Lastly, the current reporting and analysis does not examine the potential positive contributions of an enterprise to addressing particular social or environmental

problems. For example, some industries and locations present higher risks of social or environmental problems and therefore companies operating in them are expected to have enhanced CSR policies. The underlying limitation here is that analysts might make independent estimations on risk and because the process behind these estimations lacks complete information. Hence, it is difficult to ascertain true performance measurement.

CHAPTER 2

LITERATURE REVIEW AND RESEARCH FRAMEWORK

This chapter presents the conceptual background and analytical framework that forms the basis of current study.

2.1 Literature Review

Sustainability and corporate responsibility is a prominent feature of the business and society literature, addressing topics of business ethics, corporate social performance, global corporate citizenship, and stakeholder management. The review of literature on forces affecting corporate social responsibility and sustainability performance are also presented in the following subsections.

2.1.1 Forces Shaping Sustainable Practices

A survey by Price water house Coopers (2011) reported, an unprecedented level of business transparency is allowing companies to compete for investor attention by using non-financial indicators that may have implications for business value. The studies comparing corporate financial and social performance have shown inconclusive results, primarily because of two kinds of dynamics that influence firms. There are firms that include CSR as part of their strategy to build corporate identity, and here are firms that have been targeted by activists and thus are displaying CSR as a defensive tactic.

Elkington (1999) professed that this would require dramatic changes in the organizations' performance against the economic, social and environmental (triple) bottom lines and thus paying more and more attention to their values and responsibility. Sustainability also necessitates the transformation of mindset and commitment of the leadership and organizational performance to include key stakeholders.

Epstein (2008) established the emergence of sustainability as corporate strategy, and making sustainability an integral part of a company's business strategy in order to obtain the bottom-line benefits. Epstein also indicates that the management is increasingly asking how companies can improve sustainability performance, and, more specifically, how they can identify, manage and measure the drivers of improved sustainability and the systems and structures that can be created to improve performance measurements. Thus SPM has to include several factors based on the economic, ecological, and societal issues.

As the whole new approach to corporate philanthropy takes momentum, one in which corporations adopt a strategic approach that creates social impact and economic value. This can be achieved by shifting the focus to improving their competitiveness which would not only bring social and economic goals into alignment but would also improve long-term business prospects and enable companies to leverage their capabilities and relationships. (Porter & Kramer, 2003)

Tebo (2005) describes sustainable growth as a growth that creates economic and societal values while reducing overall environmental impact. It requires innovation and technology and must meet public expectations and not only the requirements as demanded by the law. Edwards (2009) further substantiates that the limits of natural resources, declining ecosystem and increasing economic disparity has given birth to sustainable practices in business. The businesses are expected to use foresight in the development of new products and processes. This shift of responsibility from the consumer and government regulators to the corporation illustrates a new business ethics.

Prilleltensky's (2000) "value-based leadership" model relies on the assumption that organizations exist to serve a purpose larger than their own existence and as a resource to the community. Clarity of vision and safety of personal interests engage individuals in value-based actions. Therefore leaders should be mindful of the ways in which interests may integrate with value-based practices. The leaders' role is to facilitate—at the individual, organizational, and community level—congruence among values, interests, and power. Richards (2003) finds that companies that develop socially responsible business managers who are consistent with ethical business practices and proactive in the social benefit context ensure companies' results in

achieving stakeholder value. Ancrum (2006) further explains that a new framework for companies to embrace comes from the recognition that profit alone does not guarantee sustainable success but needs to be balanced with other factors: reputation, brand value, CSR, and retention of human capital. This new framework is the value-creation business model, which implies the combination of personal principles, corporate ethics, and commercial sustainability.

There are substantial but contradictory claims that CSR is the future of business, that it is nothing more than a new creed to mask self-interest, and that it is a danger to the primary role of business. Joseph (2002) explains that at the national level there are significant barriers to regulating companies to ensure that they manage their social and environmental impacts. Prescriptive legislation often leads to token responses, and regulation can become an inaccurate reflection of society's concern because it is lagging behind public opinion. At the international level, because of inadequate global governance and discrepancies between national social and environmental laws, improvements in corporate practices often have to rely on voluntary actions. Pressure from stakeholders can in theory be a formidable force for improvements in behavior.

Laszlo (2003) argued that sustainable value is created from the shared interests of stakeholders and shareholders through an integrated economic, social and environmental approach that transfer value from one or more stakeholders to the company's shareholders.

Vogel (2005) highlighted the business case for virtue in corporations i.e. reasons firms engage in CSR activities. His research examined market activities that encourage CSR practices, as well as those that limit these activities. This research concluded that whether induced by strategy, defense, altruism, or public-spiritedness; various market dimensions, such as consumer demand; threatened boycotts; challenges by NGOs; pressure from socially responsible investors; or the values of managers and employees, CSR does matter to many firms.

To demonstrate that positive CSR can be linked to improved financial performance, the study by Husted & Allen (2007) suggest that the intentional use of social strategy depends upon the presence of specific configurations of industry environment, resources, and values. The relationship of firm financial performance to

social responsibility is a complex one mediated by a whole series of intervening variables.

Malini (2006) argues that in emerging economies, a smart approach, considering universal norms and values, is needed to lead the transformative potential of CSR as a movement. This approach would also control and avoid the environmental and social consequences of rapid growth. Furthermore, it is necessary to have energetic national corporate leadership along with solid homegrown constituencies demanding higher corporate standards. Social and political contests are then the fundamental part of the journey of negotiating the balance between society, state, and market.

The central premise behind creating “corporate shared value” is that the competitiveness of a company and the health of the communities around it are mutually dependent. Recognizing and capitalizing on these connections between societal and economic progress has the power to unleash the next wave of global growth and to redefine capitalism. Porter and Kramer’s (2011) shared value model received global attention. It is based on the idea that corporate success and social welfare are interdependent. He argues that a business needs a healthy, educated workforce, sustainable resources and adept government to compete effectively. For society to thrive, profitable and competitive businesses must be developed and supported to create income, wealth, tax revenues, and opportunities for philanthropy. Porter’s article acknowledges trade-offs between short-term profitability and social or environmental goals, but focuses more on the opportunities for competitive advantage from building a social value proposition into corporate strategy.

King Bhumibol Adulyadej's "sufficiency economy philosophy" is a guide more akin to a theory to making decisions that will produce outcomes that are beneficial to development. The theory is based upon a Middle Path between society at the local level and the market in the global context. By highlighting a balanced approach, the philosophy allows the nation to modernize without resisting globalization, but provides a means to counteract negative outcomes from rapid economic and cultural transitions (Navarat Sachayanasrisakul, 2009). Institutional ownership exerts a direct and significant influence on corporate governance in areas such as board composition, CEO duality, leadership diversity, and ownership concentration.

Institutional ownership has only an indirect effect on firm performance, such as corporate profitability. (Li et al., 2006)

Campbell (2007) offers an institutional theory of corporate social responsibility consisting of a series of propositions specifying the conditions under which corporations are likely to behave in socially responsible ways. He argues that economic conditions—specifically, the relative health of corporations and the economy and the level of competition to which corporations are exposed - affect the probability that corporations will act in socially responsible ways. The author presents several propositions like financial condition, economy and level of competition, self-regulations, stakeholder interest, media and employee associations; that influence a corporation's level of social responsibility. Also, the relationship between basic economic conditions and corporate behavior is mediated by several institutional conditions: public and private regulation, the presence of nongovernmental and other independent organizations that monitor corporate behavior, institutionalized norms regarding appropriate corporate behavior, associative behavior among corporations themselves, and organized dialogues among corporations and their stakeholders.

Black and Hartel (2003) argues that CSR is an ongoing interaction in relationships between firms and stakeholders. Individually these capacities could not produce social performance. However, together they comprise the organizational behaviors that could lead to socially responsible performance. Mackey et al. (2007) further substantiate the argument that the equity holders may sometimes have interests besides simply maximizing their wealth when they make their investment decisions. If the demand for socially responsible investment opportunities is greater than the supply, then economic value will be created, and thus, managers in publicly traded firms might fund socially responsible activities that do not maximize the present value of the firm's cash flow. However, if supply exceeds demand, the opposite impact on firm value may occur.

Hirschland (2006) argues that CSR pushes business toward a greater accounting of all the various stakeholder needs and the impacts that business operations have on people and their natural environment. It is defined here as the expectations of businesses by non-stake stakeholder group, and the strategic

management of these demands by businesses that help to assure profits and enterprise sustainability.

A content analysis based on “stakeholder theory”, by Sweeney and Coughlan (2008) found that significant emphasis is given to stakeholder attributes and characteristics, including power, legitimacy, and urgency, as well as to primary and secondary stakeholder categorizations. The analysis identified strong similarities in the targeting of CSR communications in the annual reports and intra-industries, but points out a lack of clear focus on the benefits of CSR for the shareholder.

Utting (2005) argues that the future of the dual CSR movements (civil society organizations versus business) will depend on the degree of convergence and co-regulation between the sectors. It will depend as well on new forms of activism centered on “corporate accountability,” while issuing cautions regarding biases toward business in these multi-stakeholder initiatives. Unlike CSR, which emphasizes moral compulsion, corporate accountability suggests that TNCs have to answer to their stakeholders and be held to account through some element of punishment or sanction. These changes will lead to a new approach to CSR.

A conceptual paper by Van Kleef and Roome (2007) addresses the business challenge of sustainable development seen in terms of an “innovation process.” The paper emphasizes the need for sustainability-driven innovation to engage a wider range of external actors and recognizes the importance of vision as a guide to those involved in innovation, while values and management attitudes provide a basis for the alignment of strategic processes. `

Managing sustainability holistically is challenging and requires a sound management framework that integrates environmental and social performance with economic business performance (Epstein & Roy, 2003; Schaltegger & Wagner, 2006; Johnson, 2007). However, Schaltegger & Wagner, (2006) raises a vital question on managing sustainability as its activities may result in establishing a parallel organization within the company dealing with non-economic issues and measuring non-economic aspects of performance.

Epstein and Roy’s nine principles (Table 2.1) of sustainability performance is a fair guideline and can be integrated into day-to-day management decision.

Table 2.1 The Nine Principles of Sustainability Performance

The Nine Principles of Sustainability Performance	
Ethics	The company establishes, promotes, monitors, and maintains ethical standards and practices in dealing with all the company stakeholders
Governance	The company manages all of its resources conscientiously and effectively, recognizing the fiduciary duty of corporate boards and manages to focus on the interests of all company stakeholders
Transparency	The company provides timely disclosure of information about its products, services and activities, thus permitting stakeholders to make informed decision.
Business Relationship	The company engages in fair-trading practices with suppliers, distributors and partners
Financial return	The company compensates providers of capital with a competitive return on investment and the protection of company assets
Community involvement/economic development	The company fosters a mutually beneficial relationship between the corporation and community in which it is sensitive to the culture, context, and needs of the community
Value of products and services	The company respects the needs, desires, and rights of its customers and strives to provide the highest level of product and service values
Employment practices	The company engages in human-resource management practices and promote personal and professional employee development, diversity, and empowerment
Protection of the environment	The company strives to protect and restore the environment and promote sustainable development with products, processes, services and other activities.

Source: Epstein and Roy, 2003.

2.1.2 Concepts of Performance Measurement

The concept of performance measurement has long been recognized by academics and practitioners from a variety of functional disciplines. “A performance measurement system can be defined as the set of metrics used to quantify both the efficiency and effectiveness of actions” (Neely et al., 1995). The 21st century business is highly turbulent and the only constant is change itself. The business environment has evolved rapidly over the past few decades which have caused almost every aspect of organization and management to change accordingly. In this environment, a necessary condition to achieve high performance standards is being able to effectively measure and monitor company’s performance. Business environment requires management accounting information to provide relevant measures of performance, and reflect the strategic goals of a modern firm. The performance measurement system (PMS) developed as strategic orientation aimed at providing information to enhance the firm’s strategic goals.

Therefore, performance measurement systems are considered as a means to gain competitive advantages and continuously react and adapt to external changes. Kaplan and Norton (1992) article initiated a debate and general acceptance in practice that a mix of financial and non-financial measures in performance measurement system is beneficial. Performance-measurement systems can play a crucial role in strategy implementation by helping to translate firm’s strategy into desired behaviors and results, communicate expectations, monitor progress, provide feedback, and motivate employees to improve firm’s performance (Kaplan & Norton, 1992). The benefits of employing a balanced performance system are typically articulated in terms of the limitations of traditional financial measures (McNamara & Mong, 2005)

“A performance measurement system enables organization to ensure it is tracking along an appropriate path as it moves from its current state to future state.” (Hacker & Brotherton, 1998). Focussed performance measurement that is also well aligned with the business strategy and supported by control mechanisms may actually improvr firm’s profitability (Buhovac & Sergeja, 2007). Despite the vast amount of research on performance measurement, there is a need for conceptualizations, classifications and frameworks which can be used in identifying common features and differences between various business operations in relation to measurement-related

needs and requirements. Performance measurement is part of management tool and responsibility, a quality management system, and a learning organization and the future driver of performance measurement leads to good governance, transparency, and accountability and a success factor of performance audit and organizational competency/capability (Kongkiti Phusavat et al., 2009).

The evolutionary path of performance measurement (Srimai et al., 2011) is an attempt in achieving an understanding of the nature and force of the transitionary paths of performance measurement, especially from the 1980s up to the present. The main paths of evolution appear to flow from operations to strategic; measurement to management; static to dynamic; and shareholder values (economic-profits) to stakeholder focuses. These flows reflect the change and shift in competitive, social, environmental, organizational and managerial factors. The literature on organizational effectiveness (Henri, 2004) contains several models including the goal, system, strategic-constituencies, competing-values and ineffectiveness models. The first three are well integrated in performance measurement cybernetics and holistic views. Determining the performance measurement system design, the mix of financial and non-financial information and the use of the diagnostic and interactive approach would merit further research. A performance measurement system for enterprise networks (PMS-EN) (Saiz et al., 2007) can be used for managing performance in the enterprise networks context. After analyzing and identifying the weaknesses of different frameworks, PMS-EN attempts to overcome these difficulties and, at the same time, provide enterprises operating within these environments, a simple, efficient, robust and useful framework. In Supply chain performance measurement is a context-dependent process (Cuthbertson & Piotrowicz, 2011), tailored to specific supply chain requirements and there is need to capture context, process and content to understand how a performance measurement system in a supply chain is developed and used.

How to include the sustainability agenda as part of the whole performance measurement system within the organization or the network is a key challenge. (Bititci, 2011) argued that there are three grand challenges the performance measurement research community needs to address in an integrated manner. These are: understanding performance measurement as a social system; a learning system;

and understanding performance measurement in autopoietic networks (knowledge economy). Performance measurement stands as one of the key factors of strategic planning that have a critical role in translating strategy into action and supporting in the development of strategies (Tapinos et al., 2005). To make sustainability and performance measurement more relevant citizen-driven performance measurements, linking it with political accountability, facilitate double-loop policy learning, and measuring fairness (Yang, 2008).

Performance measurement is an integral part of business. It depends on systematic collection and analysis of performance data and measurement remains a central requirement for improving performance. In the past financial performance measurement was seen as the most significant indicator of performance but since the 1980s the trend has moved toward a combination of financial and non-financial performance measurements. The literature supports the concept of linking performance measurement systems to an organization's strategy. An example of performance measurement systems that link to strategy is the balanced scorecard (Kodrowski & Youngblood, 2008; Kasie & Belay, 2013). Companies which measure their performance using important financial and non-financial measures achieve better business performance. Companies currently using non-financial measures, not necessarily have these non-financial measures integrated with each other, financial measures and strategic objectives.

The financial indicators of organizational performance do not suffice to steer modern organization (Dimovski & Skerlavaj, 2004). A broader view of organizational performance is needed in order to satisfy the need of all stakeholder groups. Freeman's Stakeholder Theory (1984) provides an important contribution in this area and establishes a basis for the development of non-financial indicators organizational performance. Aki Jaaskelainen et al. (2012) proposes an approach for analyzing and developing measurement practices in different service contexts. The approach pays attention to the contingency factors in relation to the common tasks in measurement system development. It should be noted that even though service-specific contingency factors may be separate to generic contingency factors they are also very likely the building blocks of dominant contingency factors (e.g. strategy).

The advent of electronic business (e-business) has heralded some fundamental changes in the way that existing businesses operate. In order to participate fully in the new online business environment, businesses continue to have to make significant financial investments, not only in information and communication technologies (ICTs) but also in the processes and people necessary to operate them. Hinton and Barnes (2008) research illustrate that no effective e-business performance measurement system exist as yet. However, it may be in the process of being discovered by the actions of organizations. The study uncovered a variety of approaches to e-business performance measurement, with no common framework apparent; there is evidence of a common concern to link e-business performance to organizational objectives.

Santos et al. (2002) proposed a framework to assist performance measurement and management incorporating the integrated use of multi-criteria decision analysis (MCDA) and system dynamics (SD) that provides a means of addressing measurement issues. System dynamics was conceived and developed in early 1960s at Massachusetts Institutes of Technology (MIT) by Jay Forrester followed by publication of his pioneering book 'Industrial Dynamics' in 1961. Since then significant advances have been made and further examination of literature suggests that SD is used by a growing number of organizations. The dynamics of SD is defined by its structure (Design-Measure-Analyze-Improve) in a cyclic process. MCDA is designed to take explicit account of multiple and usually conflicting objectives in supporting the decision process.

It is further established that despite the recommendations from experts and academics, manufacturing firms continue to use financial performance measures and proportions of firms using balanced scorecard or integrated performance measurement systems is low. Furthermore, organizations are not employing more extensively non-financial measures than those which are applying traditional performance approaches. Financial performance measures continue to be an important aspect of performance measurement system. These measures are supplemented with several non-financial performance measures. However, the type of non-financial performance measures used by the companies depends on the perceived usefulness of the information that may result from using these measures in performance measurements and evaluation. (Gosselin, 2005; Zuriekat et al., 2011). Performance measurement system roles

comprehension is essential for understanding the entire operations strategic management system dynamics. The roles dialectics played by performance measurement systems, acting as medium for operations strategy realization or as enabler for strategic management system redesign, is the key foundation for organizational learning (De Lima et al., 2010).

Performance is a key dependent variable of interest in the field of international business (IB) with the question asked by scholars, why some firms outperform others in the global arena? However, although a great deal of research has focused on performance, IB researchers lament that the field has yielded little by way of conclusive results leading to determinants of performance. A study (Hult et al., 2007) findings related to the types of measure used (i.e., financial, operational and overall effectiveness) indicate that only seven studies (7.3% of the 96 studies assessed) used all three types of performance measurement. The use of two types of performance measure in a given study was more common, but studies of this sort constituted only 32.3% (31/96) of performance research over the 11-year period. An integrated framework (Rouse, 2003) provides both micro and macro views of the organization and captures the summary with three dimensions of performance measurement: evolution, analyses and measures. A set of principles is derived that illustrates how the performance measurement discipline could progress and commence to builds a common body of knowledge around performance measurement.

Marketing performance measurement, an emerging practice, provides performance feedback to the organizations regarding the results of its marketing efforts. Measurement leads to improved performance and marketing performance measurement positively impacts firm performance. (Clark et al., 2006; O'Sullivan et al., 2009) Clark explored this as an information processing perspective and found that satisfaction with performance measurement is driven more by the dissemination of performance information within the firm, and information overload can lead to negative consequences. Applying non-financial performance measures does not necessarily mean that intangible resources are fully covered. Traditional financial data are no longer leading indicators of the performance of an organization, and that some progress has been made in terms of using integrated systems to measure also non-financial performance drivers (Zigan & Zeglat, 2010). Still, these performance

measurement systems do not fully consider intangible resources, which have been identified to significantly influence the performance.

The literature suggests designing new performance management system (PMS) that include financial and non-financial measures. Kaplan and Norton (1992) advocated in favour of design of balanced scorecards. “A successful performance measurement system is a set of performance measures (i.e. a metric used to quantify the efficiency and effectiveness of action) that provides a company with useful information that helps to manage, control, plan and perform the activities undertaken in the company (Tangen, 2004).” The PMS requirements falls into two categories: System requirements represents criteria important from an overall system point of view and selection of both financial and non-financial performance i.e. what to measure. Measure requirements represent criteria important when designing an individual performance measure i.e. how to measure.

Critiques of PMS suggests that it is not sufficient to improve organization performance and they encourage local optimization, fail to account for issues other than financial performance, do not reflect the fact that the organization has pluralistic goals, and do not recognize that the organization operates in dynamic internal and external environments and PMS should focus primarily on measuring the performance of internal processes and operations (Castellano & Young, 2006). Even in organizations with a strong commitment to measuring performance, overcoming internal issues is a significant challenge. These challenges are amplified by the fact that organizational performance measurement must always be context-specific and no two measurement systems will ever be designed and implemented in exactly the same way. These challenges may be addressed through the application of a systems approach (Searcy, 2008) through system design, implementation and evolution. A systems approach to performance measurement can help an organization address many of the challenges inherent in the design, implementation, and evolution of a performance measurement system. In particular, a systems approach is particularly useful in helping to develop the process of creating a measurement system.

The world is changing, thus, requiring changes in the way organizations are managed. Increasing emphasis on sustainability could be a touchstone of future competitive advantage, as it drives cost reduction, increases in revenues and

innovations it is evident that in response to internal and external pressure, organizations are introducing sustainable principles to the business. This trend directly relates to the environmental and social performance themes, and how they will be evaluated. What is missing from most strategic systems are not the planning but implementation aspects and implementation requires an effective measurement system to ensure that actions and plans are appropriately linked? An effective measurement system ensures that strategic management system functions well and stay on course (Hacker & Brotherton, 1998). The performance measurement processes and practices utilized within firms are to a considerable degree incompatible with central characteristics of extended enterprises (Lehtinen & Ahola, 2010). A conflict between the two streams of literature is related to choosing individual performance measures (i.e. the question of what to measure). Performance measurement literature emphasizes intra-organizational measures which conflicts starkly with the emphasis of inter-organizational collaboration required for extended enterprises.

However, the literature on performance measurement and sustainability is still focused at corporate level and on relating sustainability with financial performance and competitive advantage (Leite et al., 2012). Further, this analysis does not show evidence of a linkage between classic references in performance measurement (as identified by Neely, (2005) with sustainability highlighting this gap. According to these authors, the body of literature takes an isolated view of performance measurement and sustainability without sufficient recognition of the challenge. In fact, according to this work, the literature on performance measurement and sustainable development recognizes the need for performance measurement systems to incorporate dimensions of sustainability, and new frameworks which integrate sustainability measures.

A possible explanation is that most performance measurement systems are historical and static; therefore, they are not dynamic and sensitive to changes in the internal and external environment of the firm. The management accounting systems, which depends on periodic financial statements, become isolated from the real value-creating operations of the organization and fails to realize that accounting numbers not necessarily provide relevant or appropriate information. In a similar way, performance measurement systems that focus sustainability only at a strategic level

may not be effective in providing relevant or appropriate information for decision makers in the organization’s operations. What happened to accounting performance measurement systems may be not happening to sustainability performance measurement systems; rather than to extract information about the organization's sustainability, these performance measurement systems are designed primarily to satisfy external reporting requirements (such as the Global Reporting Initiative) and auditing requirements (such as ISO 14001).

Measuring performance is an important component of the strategic planning process. There is significant association between strategy, organizational structure and environmental uncertainty and the types of performance measures (financial, non-financial, process, outcome) that are used by organizations and the adoption of innovative performance measurement approaches such as balanced scorecards (Gosselin, 2011). Further, Performance measures should be derived from strategy, should be clearly defined with an explicit purpose, should be relevant and easy to maintain, should be simple to understand and use, should provide fast and accurate feedback, should stimulate continuous improvement, should link operations to strategic goals, and should employ ratios and nonfinancial measures. The primary function of performance measurement system in an organization is to control its operations by designing guidelines for expectations and performance thus it facilitates learning. (Amaratunga & Baldry, 2002).

The dynamic relationship between performance measurement, management styles and organizational culture leads to a management style that need to evolve as the maturity of the performance measurement system and the organizational culture evolve. (Bititci et al., 2006) Organizational culture and management style seem to be interdependent throughout the lifecycle of the performance measurement system. A successfully implemented and used performance measurement system, through cultural change, leads to a more participative and consultative management style. Similarly, the correct use of performance measurement systems can encourage an achievement culture to emerge.

The eight step process (Andersen and Fagerhaug, 2002) for creating a performance measurement system can be grouped in three stages i.e. conceptualization, development and implementation.

Table 2.2 Eight Step Performance Measurement System

Stage 1: Conceptualize	Stage 2: Develop	Stage 3: Implement
1. Understand and map business structure and processes	4. Design reporting and performance data presentation formats	7. Test and adjust the performance measurement system
2. Understand the current measurement system	5. Develop business performance priorities	8. Implement the performance measurement system
3. Decide how to collect the required data	6. Develop performance indicators	

Source: Adopted from Andersen and Fagerhaug, 2002.

Value based measurement is a major development tool comparing to the traditional financial performance measurement tools. Accounting tools are not sufficient and unlikely in facing the challenge arising from efficient capital markets. The inclusion of a firms' cost of capital in the calculation will determine whether or not value is created. Economic Value Added (EVA) measurement tool has received most attention in the developed countries. However, though value based measurement has gained attention in the developed economies, it is said that the developing economies are still behind in using value based performance measures as firm performance measurement tools as found in studies in Malaysia and China. (Mamun et al., 2012; Lin & Zhilin, 2008) The process is strongly guided by the need to identify existing reports and matrix at different levels within the organization as a more significant role than has been proposed in the literature (Wouters & Sportel, 2005).

The accounting literature considers the concept of measurement to be fundamental to the preparations to financial statement and the measurement as an

indispensable part of accounting, however, accounting informaion is routinely generated through formally defined channels, and quantitative in nature and in financial terms. Performance measurement, on the other hand encompass qualitative information too provided by different information system and covers a wide range of both financial and non-financial information. The accounting concepts of measurement is thus not compatible with the scientific principles of measurement (Rejc, 2004; Musvoto, 2011).

There is large amount of recommendation of Performance Measurement System (PMS) related to the discipline of performance measurement (Cocca & Alberti, 2009). These recommendations are grouped into two categories: performance measures and design requirements. The most important elements that should be considered as “best practices” are summarized in the following list:

Table 2.3 Performance Measurement Characteristics & Design Requirements

Performance Measure Characteristics	**Design Requirements**
▪ Derived from strategy. ▪ Link operations to strategic goals. ▪ Simple to understand and use. ▪ Clearly defined/explicit purpose. ▪ Stimulate continuous improvement/right behaviour. ▪ Relevant and easy to maintain. ▪ Provide fast, accurate feedback. ▪ Balanced/multidimensional picture of business. ▪ Monitoring past performance. ▪ Planning future performance. ▪ All stakeholders considered.	▪ Evaluation/audit existing PMS. ▪ Strategic objectives identification. ▪ Top management support/commitment. ▪ Key users/employee involvement/support. ▪ Facilitator. ▪ Maintenance structure. ▪ Targets/benchmarks setting. ▪ Timescales setting. ▪ A responsible for the measure. ▪ Performance monitoring process. ▪ Alarm signal/corrective actions. ▪ Double-loop learning/challenge strategy.

Table 2.3 (Continued)

Performance Measure Characteristics	Design Requirements
▪ Promote integration. ▪ Defined formula and source of data.	▪ Relationships between measures. ▪ Linking performance to compensation process. ▪ Procedures defined. ▪ IT infrastructure support.

Source: Adopted from Cocca and Alberti, 2009.

A large number of performance measurement frameworks aimed at evaluating performance have been developed. The Balanced Scorecard (BSC) (Kaplan & Norton, 1992) identified many companies tended to manage their businesses based solely on financial measures. While that may have worked well in the past, the pace of business in today's world requires more comprehensive measures. Though financial measures are necessary, they can only report what has happened in the past where a business has been, but not where it is headed. The BSC is a system for managing performance that stems from an organization's vision and initial strategy. Its measures span four areas: financial performance, customer relations, internal business processes, and the organization's learning and innovation activities. Measurement is a key aspect of the Balanced Scorecard, but it takes measurement further as a means to setting and achieving the strategic goals and objectives of organization as tool for management system to plan, implement and achieve their business strategy. BSC has received the most practitioner attention, with literature suggesting that majority of firms surveyed were using a scorecard.

Companies seem to lack in either operational strategy, or competitive objectives which affects the guiding force required for performance measurement system which can lead to a disruptive gap between the strategy and the measurement (Diaz, 2005). The concept of the BSC is based on an organization's strategic plan that is implemented by unifying the actions in all the departments concerned through a common understanding of its aims that thus facilitates the evaluation and updating of the strategy. Since the work of Kaplan and Norton, the balanced scorecard has

stimulated a great deal of interest and corporations are using it across the globe (Cheffi et al., 2010). The balanced scorecard has four basic measurement areas: customer connectivity, internal process efficiency and effectiveness, individual and group innovation and learning and financials. The balanced scorecard provides a holistic view of short and long term health of organization by having metrics established in each of basic elements (Hacker & Brotherton, 1998).

Literature and surveys suggest that Balanced Scorecard prevails as the most influential and widely accepted performance measurement system. It offers a medium to deliver strategic vision while providing an evaluation system (Amaratunga et al., 2001; Paranjape et al., 2006). The implementation of Balanced Scorecard however is operationally difficult, constraining and there is no concrete evidence that it leads to improved performance. The concept has delivered a totally new and radical approach to business process management but performance measurement is still a rather broad and problematic area for many organizations and involves design, measures, and implementation issues relevant to organizational changes. New approaches to performance measurement have solved some of the limitations of the traditional way of measuring performance (Tangen, 2004) like performance pyramid and balance scorecards are two good examples of strategically driven systems and trying to limit the number of performance measures to avoid information overload and guard against measurement challenges.

Performance measurement models are largely based on the deterministic assumption but now it needs to be re-aligned with post-deterministic discoveries made in the physical science by asking what lessons can be drawn for performance measurement from this knowledge of physical world like quantum physics (Palmer & Parker, 2001). Neely (2005) further argues that the performance measurement field is now entering a phase of empirical investigation and theoretical verification of some concepts.

2.1.3 Sustainability Defined

Sustainability is an activity of lasting value with capacity to endure within earth's carrying capacity. This in terms of business and economic activity has become a major issue for global business and for government at all levels. But there is no

universally accepted definition of 'sustainability' and measurement of progress toward sustainability is still more art than science. What is measured, how it is measured, what range of indicators are appropriate, how one values the present in relation to the future and how one arrives at a final judgment where ecological, social and economic indicators move in different directions, are all matters of intense debate and open for interpretation.

Epstein (2008) nine principles discussed above make the definition of sustainability more precise as defines sustainability performance as the effect of corporate activity on the social, environmental, and economic fabric of society. “Economic development that meets the need of the present generation without compromising the ability of future generations to meet their needs” (WCED) is the most acceptable universal definition that stresses on the lasting value of the economy that can be equally useful for future generations. Tebo (2005) put forward similar views the Sustainable growth is a growth that creates economic and societal values while reducing overall environmental impact.

A governmental view, though may not be substantiated for its actual practices suggests that “Corporate sustainability encompasses strategies and practices that aim to meet the needs of stakeholders today while seeking to protect, support and enhance the human and natural resources that will be needed in the future”. The discrepancy is noted in another governmental view that suggests “CSR is a way of thinking about and doing business that needs to be ‘mainstreamed’ across business operations and into company strategy. It is not just a task for the public relations department but needs to permeate across the company”. The gap lies in two different views while one suggests a broader arena of sustainability while the other restricts it to the operations and strategic level.

A corporate view by World Business Council for Sustainable Development sees sustainability as “Continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families, as well as of the local community and society at large.” The Dow Jones Sustainability Index (DJSI) defines corporate sustainability as “a business approach that creates long-term shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments.”

The academic view on sustainability and CSR sees it as balancing act by corporations to achieve profit and stakeholder fulfillment while trying to be socially responsible. Van Marrewijk and Werre (2003) refers sustainability to an organization's activities, typically considered voluntary, that demonstrate the inclusion of social and environmental concerns in business operations and in interactions with stakeholders. Doane (2005) shed the eyewash by suggesting that although some see CSR as simply philanthropy by a different name, it can be defined broadly as the efforts corporations make above and beyond regulation to balance the needs of stakeholders with the need to make a profit. Gillis and Spring (2001) have a more comprehensive and balanced view to suggest that CSR is defined as business decision making based on ethical values; compliance with legal standards; and respect for communities, citizens, and the environment. The key factors that must be addressed under the CSR umbrella: environment, employment, and human rights with mission and business core values, response to constituent pressure, corporate philanthropy, and corporate partnerships. The various stakeholder groups and their respective positions lead to concerns in the CSR landscape. The final obligation is the measuring, communicating, and reporting of CSR.

The TBL incorporates three dimensions of performance: social, environmental and financial in an integrated accounting framework. The environmental and social measures can be difficult to assign appropriate means of measurement that differs from traditional reporting frameworks. The TBL dimensions are also commonly called the three Ps: people, planet and profits. The TBL "captures the essence of sustainability by measuring the impact of an organization's activities on the world ... including both its profitability and shareholder values and its social, human and environmental capital." (Slaper & Hall, 2011) The challenge isn't defining TBL. The challenge is to measure it.

Sustainable Value is progression to integration that integrates the economic, environmental and social dimension of sustainability. Financial Markets value resources that come without a value denomination but environmental and social resources needs to be evaluated similar to economic resources.

2.1.4 Arguments for and Against Sustainability Performance Measurement

Many approaches to Sustainability and CSR pit businesses against society, emphasizing the costs and limitations of compliance with externally imposed social and environmental standards. Milton Freidman in 1966 famously and controversially stated that "the raison d'être for corporations is to maximize profit and shareholder value and corporations will do whatever it takes to achieve this goal".

Handy (2002) proposes that the purpose of business is not to make a profit, "full stop," but rather to make a profit so that the business can do something more or better… taking the lead in environmental and social sustainability by adopting a community approach might well be the key to changing current views of capitalism.

Gil Estallo et al. (2007) study also highlight a point of contention with Friedman's (1966) statement indicating that it did not take into account all of the people that must cooperate and perform in order to make a profit. In addition, they indicate that maximizing profit is simply a mathematical concept, as there is always the possibility of achieving a higher performance. In the current business context of extreme competition and rapidly changing information, companies have to treat every one of their human collectives responsibly and adapt to the context in which it is located in order to grow and make profits.

Cohen (2011) explains "sustainability metrics" as an organization or jurisdiction's indicators of resource utilization, waste reduction, and pollutant discharge into environment such as material intensity, material intensity, water consumption, toxic emissions, pollutant emission and other factors influenced by geography, culture and production factor (aspects of sustainability) that an organization should measure. However, there is no agreed set of sustainability metrics. As the organization learns new indicators needs to be developed analyzed and reported separately from routine indicators. Once the metrics are established and reflected in organizations standard operating procedures they should be integrated into the regular performance measurement system.

Fowler and Hope (2007) analysis of Hart's (1995) Natural Resource Based View (NRBV) suggests that it is a development of the "Strategic Management Theory and Sustainability approach". In response to old approaches consistent with

Friedman's neoclassical view that the primary duty of management is to maximize return to shareholders, sustainability scholars defend win-win scenarios where companies can maximize return while making progress toward the implementation of sustainable business practices through three interlinking strategies: process innovation to reduce pollution by reducing waste, product stewardship or the implementation of the life-cycle analysis to measure the impact of the product throughout its life, and sustainable development or the development of new low-impact technologies. These strategies allow consideration of the social impact of a firm and its engagement with stakeholders.

Naomi Klein's famous book, "No Logo," gave voice to a generation that felt that big business had taken over the world, to the detriment of people and the environment, even as that generation was successfully mobilizing attacks on corporate power following the Seattle anti-globalization riots in 1999.

According to conservative estimates, the world's population is estimated to increase to 9 billion by 2050, with most of the growth in developing countries. Increasing urbanization and efforts to combat poverty will lead to rapid energy and infrastructure growth demand in these countries. While this offers a huge growth opportunity for business, it also presents companies with the challenge to address the climate change.

Businesses understand that an unsustainable world is not a good place for doing business. The world needs business as a committed solution provider to meet future energy and climate challenges. Business is the main source of innovation, solutions and financing for the growth required, and it must continue to play a strong role in the future climate regime. This requires accelerated innovation, collaboration and implementation of low carbon solutions. It also requires greater collaboration across business sectors and between business, government, academia and civil society. Companies and governments recognize that a 'green race' is underway. This is a race fuelled by concerns for energy security and the need to manage resource scarcity. It reflects the constraints imposed by both climate change and the current economic situation that encourages cost savings through efficiency improvement.

Companies want to gain a competitive advantage in future markets and need to anticipate regulatory regimes and demand by consumers. Much has already been done

in the absence of price signals and climate regulations, but more can be done with efficient policies. Following table throws light on the expanding role and grips of corporations on world economy their indispensable role.

Prahalad and Hammond (2003) explains that misconceptions and inaccurate assumptions exist about business opportunities and profitability at the bottom of the economic pyramid. While incomes average only US $2,000 per year, there are four billion people in this sector. Thus, these authors argue, when multinational corporations (MNCs) provide basic goods and services that reduce costs to the poor and help improve their standard of living (while generating an acceptable return on investment) the results benefit everyone. Further, by serving the poor, business can gain new sources of rapid revenue growth, greater efficiencies with cost reduction initiatives for the MNC, which also translate to increased purchasing power for the local consumers, as well as access to innovation. Strategies for MNCs to profitably expand their businesses and serve the world's poor.

Table 2.4 The Size of Corporation

The Size of Corporation
1. Fifty-one of the one hundred largest economies in the world are now corporation, not nations.
2. They are massive mansions unto themselves who have great political leverage.
3. The one hundred largest multinational corporations (MNCs) now control about 20 percent of global foreign assets. The top one hundred are household names.
4. Three hundred MNCs-conglomerates such as Honey-well, IBM, DuPont, Dow, and Whirlpool-now account for 25 percent of the world's total assets, a sizeable impact.
5. As much as 40 percent of world trade now occurs within these top multinationals, which explains why they are studied and emulated by smaller companies
6. Only twenty one nations have gross domestic product markets larger than the annual sales revenue of each of the six largest multinational corporations.

Source: Piasecki, 2007: 4.

D' Amato et al. (2009) provides a more balanced view of corporate role and responsibility on sustainability. He argues that it is no longer acceptable for a corporation to experience economic prosperity in isolation from those agents impacted by its actions. A firm must now focus its attention on both increasing its bottom line and being a good corporate citizen. He further provides the view that keeping abreast of global trends and remaining committed to financial obligations to deliver both private and public benefits have forced organizations to reshape their frameworks, rules, and business models. To understand and enhance current efforts, the most socially responsible organizations continue to revise their short- and long-term agendas, to stay ahead of rapidly changing challenges. A stark and complex shift has occurred in how organizations must understand themselves in relation to a wide variety of both local and global stakeholders and have developed a variety of strategies for dealing with this intersection of societal needs, the natural environment, and corresponding business imperatives.

Fricker (2001) argues that Sustainability is more than a ‘thing’ to be measured, since it is about ecological integrity, quality of life and transformation or transcendence. Rather than ask how we can measure sustainability, it may be more appropriate to ask how we measure up to sustainability. Our emphasis on the physical, the objective, and the rational however sees only the external manifestations of sustainability. The internal manifestations of sustainability, the non-material, the subjective, and the experiential, are put to one side, since they are messy, interpretive and time-consuming.

Bell and Morse (2010) puts more challenging issues for businesses in contemporary times. In trying to tie down and measure sustainability, surely the civic, academic and developmental communities were engaging in a futile exercise of measuring the immeasurable? Although many have tried to quantify sustainability – with all the jargon and apparent rigour of the objective and reductionist mindset of much of the academic community – when looked at more closely, the approaches do not seem to work or, worse still, we end up measuring things that can be measured and not and not things that should be measured, and an element of circularity appears inevitable: sustainability becomes defined by the parameters that can be measured rather than the other way around. There key premise is that the approach to

measurement is always based on the individual's vision of sustainability, which in turn can be changed depending upon the measurement mindset.

Blowfield (2005) suggests that business is affecting the meaning of development itself and one of the ways this happens is by allowing business thinking to dominate the way we view the world and to become the norm against which everything else is tested for true and false value. Edwards (2009) stresses that although sustainability often is marked by environmental causes and protest campaigns, its value represent a broad context of issues that have spread underground in all sectors of society throughout the world. Kerr (2006) puts the point that environmental leadership must be based on the philosophy of the continuous improvement of the environmental policy and strategy development to reduce environmental impacts. Environmental reporting can be a tool for marketing a green reputation.

Blowfield and Frynas (2005) identify CSR as an umbrella term for a variety of theories and practices that recognize the following:

1) companies have a responsibility for their impact on society and the natural environment, sometimes beyond legal compliance and the liability of individuals

2) companies have a responsibility for the behavior of others with whom they do business (e.g., within supply chains)

3) business needs to manage its relationship with wider society, whether for reasons of commercial viability or to add value to society

Frynas (2005) further argues that the actual and potential contribution of companies to development faces structural constraints and that the current CSR agenda may be inappropriate for addressing social problems in developing countries and may divert attention from broader political, economic, and social solutions for such problems. CSR as it exists today has limited potential for fostering genuine local community development in practice.

Doane (2005) however, argues that it is a myth to believe that the unprecedented growth of CSR may lead some to feel a sense of optimism about the power of market mechanisms to deliver social and environmental change. But markets often fail, especially when it comes to delivering public goods; therefore, we have to be concerned that CSR activities are subject to the same limitations of markets that prompted the movement in the first place.

1) The market can deliver both short-term financial returns and long-term social benefits. (At face value, the market has indeed been a powerful force in bringing forward some measurable changes in corporate behavior.

2) The ethical consumer will drive change.

3) There will be a competitive "race to the top" over ethics amongst businesses.

4) In the global economy, countries will compete to have the best ethical practices.

Bell and Morse (2010) argues that in trying to tie down and measure sustainability were a futile exercise of measuring the immeasurable? Sustainability becomes defined by the parameters that can be measured rather than the other way round. The approach and efforts to quantify sustainability do not seem to work or worse still, end up measuring things that can be measured and not things that should be measured because an element of circularity appears inevitable. Their research findings suggests that the "approach to measurement is always based on an individual's vision of sustainability which in turn can be changed depending upon measurement mindset."

Roome and Bergin (2006) in their study present concept of sustainable development as innovation, and the path toward it as a transformational strategy. The concept is analyzed in the case study as a metaproblem, or both an organizational and systems issue. The results show how the strategy toward sustainable development would require engaging in a complex process of paradigmatic change and learning, in collaboration with many stakeholders, and that trust in the process is crucial. Another central fact learned from the case study is that the processes of innovation are distributed throughout the organization and its system; the processes span all organizational levels and require the involvement of both corporate headquarters as well as operational business units. In conclusion, sustainability as systems change respects none of the conventional boundaries developed by organizations to help them manage their normal, non-sustainable activities. It appears that organizational and social innovation requires the leadership of many individual actors to facilitate the complex process of negotiated transformation. This article considers how the East and West can develop hybrid models of business that can build rather than destroy social capital.

Senge (2003) article is drawn from a presentation on globalization and the interdependence in a global world in which one company's actions, through global business, can have consequences on the other side of the world. Kahane's three types of increasing complexity at the root of organizations' and societies' toughest problems are presented first:

1) Dynamic complexity, or cause and effect distant in time and space
2) Social complexity, or diverse stakeholders with different agendas and worldviews
3) Generative complexity, or the emergent realities wherein a solution from the past no longer fits

Solutions are envisaged in both learning and leadership, and above all, collective creativity with the resulting strategy of discovering the connections that permeate natural and social systems. Missing the connections is a sign of poor systems-thinking skills, but an increasingly interdependent world means that system thinking must become an educational priority. In recent years, thought leaders have started to construct a picture of the interdependency. According to the author, humans have an innate capacity to develop a holistic awareness of the relationships in the world. Business leaders, as well as teachers and other professionals, count on both the wisdom of the past and their own experience to create more inclusive ways of living and working. When, for example, executives in global companies talk candidly, their real concern usually is not the return on investment or sales but the social and political stability of the world in which they live.

Senge (2007) further presents and discusses three fundamental leadership roles in global organizations in this article. The author also presents and discusses the impact of the roles on consumer education in global environmental issues. First, business can draw the consumers' attention to the nature of a particular issue and lead by action concerning that issue. Second, business can form partnerships with others to shift market, technology, and regulatory conditions that individual firms cannot alter by themselves. For the third and final proposal, business can work to create alternatives rather than debate about how to change the system.

2.1.5 Factors and Tools Influencing Sustainability Performance Measurement

Multinational corporations face several challenges when operating globally and scholars suggest that they work within certain framework when determining a corporate sustainability strategy.

Hatcher (2002) notes that in the new age of CSR, the needs of stakeholders, consumers, employees, national as well as international regulators, watchdogs, NGOs, and activist groups have to be satisfied. The number of variables that could affect the bottom line appears to be growing at an exponential rate and that losing the trust of stakeholders can be fatal. The Internet is creating a cyber-citizenry which is fast eroding the power of political and business elites. Martin (2002) in his study, the virtue matrix: Calculating the return on corporate responsibility concludes that corporate responsibility should be viewed as a product or service that is subject to market pressures.

The United Nations has partnered with business to launch its own Global Compact, the world's largest voluntary corporate citizenship initiative which offered nine principles relating to human rights and the environment, and was hailed as the ethical road map for the future. It questions the business practices of emerging market TNCs that have been cultivated in areas renowned for deficient economic, political, and social frameworks that can lead to low thresholds for ethical behavior and accountability for business. And while socially responsible investment had been popular in some circles for years, eventually the mainstream investment community cottoned onto CSR.

The Global Reporting Initiative (GRI) is a non-profit organization that promotes economic, environmental and social sustainability. GRI provides all companies and organizations with a comprehensive sustainability reporting framework that is widely used around the world. The Corporate Responsibility Index (CRI) is a leading business management and benchmarking tool that enables companies to effectively measure, monitor, report and improve their impacts on society and the environment. Corporate Register is an independent, privately held & self-funded organization based in the UK and is the primary reference point for corporate responsibility (CR) reports

and resources worldwide. The Social Return on Investment (SROI) is a technique for measuring social impact based on financial measures.

$$\text{SROI} = \frac{\text{NPV (Stakeholder value)}}{\text{NPV (Investment)}}$$

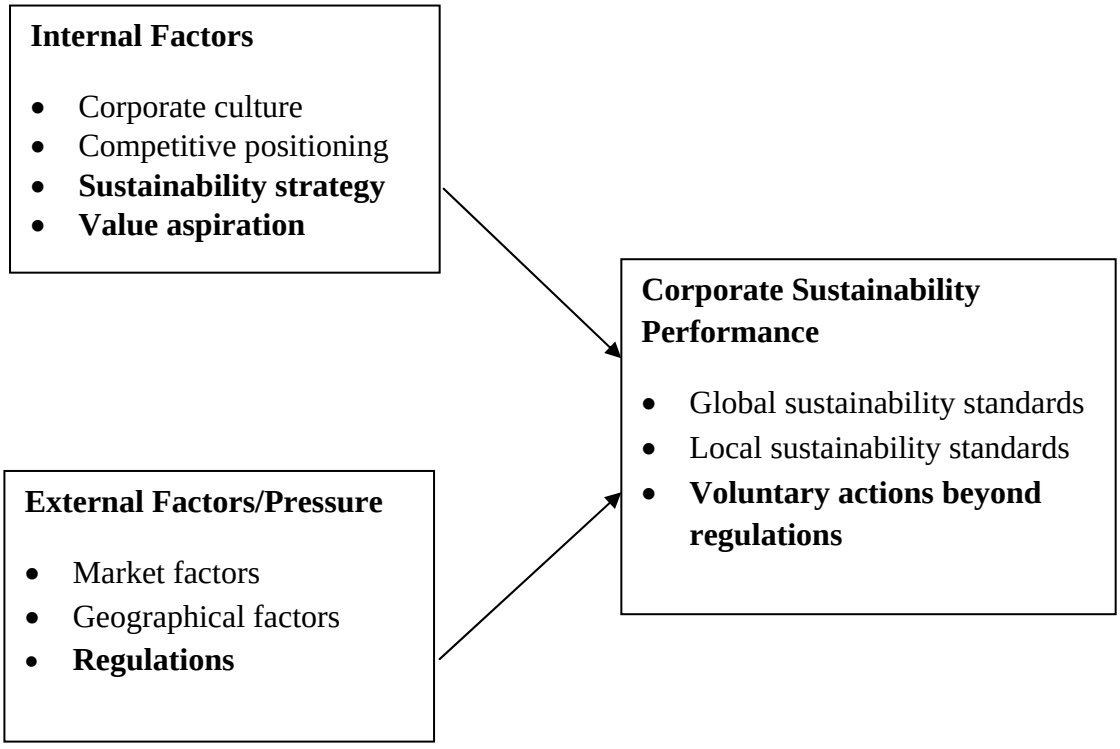


Figure 2.1 Factors Affecting Framework to Evaluate Sustainability Performance
Sources: Adopted and modified from Epstein, 2008: 69.

RepuTex social responsibility rating system provides independent measures of social responsibility performance. Like a credit rating, RepuTex rates any type of organization, be it government, private, publicly listed, or not-for-profit. RepuTex uses four key indicators to measure an organization's social performance. Responsible Competitiveness Index links the state of corporate responsibility to national competitiveness. The index is part of a report produced by an international think tank, Accountability, chaired by Simon Zadek. The index includes criteria such as corruption, civic freedom, environmental management, and corporate governance pertaining to

CSR in over 80 countries and is combined with the World Economic Forum's Global Competitiveness Index.

Dow Jones Sustainability Index (DJSI, launched in 1999), are the first global indexes tracking the financial performance of the leading sustainability-driven companies worldwide. Based on the cooperation of Dow Jones Indexes and Sustainable Asset management (SAM) they provide asset managers with reliable and objective benchmarks to manage sustainability portfolios. The DJSI is based on an analysis of corporate economic, environmental and social performance, assessing issues such as corporate governance, risk management, branding, climate change mitigation, supply chain standards and labor practices.

Lopez et al. (2007) examines whether business performance is affected by the adoption of practices included under corporate social responsibility. In the study the authors examine two groups of 55 companies. The study uses a total sample of 110 firms from the period of 1998 to 2004 and analyzes the relevant accounting indicators. Accounting information published by sample firms (Gray et al., 1995) was compiled. The relation between CSR and certain accounting indicators was analyzed. The authors examine whether there exist significant differences in performance indicators between European firms that had adopted CSR and others that had not. In conclusion, they found that the link between the performance indicator and CSR is negative. This affirms that the effect of the sustainability practices on performance indicators is negative during the first year in which they are applied. A long-term view is necessary for a company to implement new policies in the budget.

Strike et al. (2006) examines the KLD Index and found that is a particularly rich source for the evaluation of social performance because it is based on a wide range of data sources, including company surveys, expert panel assessments, and public disclosures. The ratings reflect each firm's worldwide social and environmental performance along 13 categories of CSR strengths or concerns. Results suggest that global and institutional pressures have pushed multinational enterprises (MNEs) toward higher levels of CSR, even though there is a strong argument for MNEs not acting responsibly, and this extends beyond costs.

Garvy and Newell's (2005) mainstream CSR discourse pays sufficient attention to the politics of corporate accountability and the influence of power on how mecha-

nisms of accountability and spaces for citizen participation in CSR initiatives work in practice, the authors combine lessons from this conceptual framework with analysis of the cases, to establish that a number of state-related, company-related, and community-related factors are the key to understanding the effectiveness of community-based strategies of corporate accountability. They conclude that the success of community-based strategies for corporate accountability is conditional upon the right combination of state, civil society, and corporate actors and that the factors that influence the effectiveness of corporate accountability to the poor are multiple, complex, and tightly interconnected.

An empirical study conducted by Graafland and Van de Ven (2006) tests the hypothesis that a positive strategic and moral view of CSR stimulates small and medium enterprises to undertake CSR efforts. For the purpose of the study, managers' strategic views of CSR (the extrinsic motive), as well as their moral views (the intrinsic motive), have been measured through a single-item approach and with reference to five stakeholder groups: employees, customers, competitors, suppliers, and society at large. The extrinsic motive is constructed as a company's moral duty, while the intrinsic motive sees CSR for its contribution to the long-term financial success of the company. Results show that a vast majority of respondents had a positive view of CSR in both dimensions. Nevertheless, there is a weak correlation between strategic CSR and actual CSR efforts. The strategic view generates active policies only toward consumer relations and partially toward employee relations, but not with regard to the other three stakeholders. Even though the first step for the implementation of CSR is a growing awareness of the strategic importance of CSR by top company leadership, the findings of this study reveal that a positive strategic view of CSR is not a sufficient condition for a firm to actually undertake enhancement measures. CSR implementation is more related to moral commitments than profit maximization, and this suggests a cautious view of CSR and its financial advantage.

Another empirical study by Waldman et al. (2006) was conducted on 561 firms located in 15 countries on five continents and is focused on how the cultural dimensions of institutional collectivism and power distance predict social responsibility values on the part of top management team members. Findings help shed light on the dimensionality of CSR. Through confirmatory factor analysis the authors found that,

when framed in terms of managerial decision-making values, CSR appears to be a multidimensional construct, composed of concern for shareholders, stakeholders, and community/state welfare. These components were differentially predicted by control variables—national culture-level and firm-level leadership variables. A second finding was that managers in wealthier countries may be more in tune with shareholder CSR issues in their decision-making process; in poorer countries managers may feel more of a personal responsibility toward the community and society at large. At the opposite end, managers in cultures stressing values of greater power distance tend to devalue all three aspects of CSR and tend to be more self-centered and lacking in concern for shareholders, other stakeholders, and the society at large in their decision-making process. These findings also suggest that leadership in the form of vision and integrity may help drive CSR values beyond economic or cultural factors and may even help align CSR values in decision-making processes, as well as subsequent actions based on those values, notwithstanding cultural differences. Managers in cultures supporting institutional collectivism value most aspects of CSR in the decision-making process. Such cultures have more long-term concerns and priorities and promote thinking about how managerial actions pertain to the concerns of the larger collective or society.

The main implication of the findings of the empirical study for research is that CSR and irresponsibility both move together with international diversification. Therefore, there is strong support for dividing the concept into its positive and negative components, which are separated yet related constructs. The learning for practitioners is that, with increasing diversification, firms become both more socially responsible and more socially irresponsible. While corporate irresponsibility is affected by reputation and learning, MNEs act irresponsibly because of the difficulties in managing increased complexity that derives from international diversification, that is, coordinating, integrating, and exchanging resources among geographically dispersed subsidiaries with an increase in management challenges. In addition, many of the controls used in this study emerged as significant, such as firm size and R&D intensity. As for the latter, this finding suggests that firms that invest in long-term capabilities such as research and development also invest in CSR. Also, the results

showed the food industry to be more socially responsible than the benchmarked manufacturing industry.

CSR Asia is the provider of information, training, research and consultancy services on sustainable business practices in Asia. Operating as a dynamic social enterprise, CSR Asia occupies the unique middle ground between civil society organizations and fully commercial consultancies. CSR Asia builds capacity and promotes awareness of CSR in order to advance sustainable development across the region. The Asian Sustainability Rating (ASR) is an environment, social and governance ESG benchmarking tool developed by Responsible Research and CSR Asia. ASR examines the publicly available information of the leading listed companies in ten Asian countries and provides investors, companies and other stakeholders with a view of strategic sustainability of these companies.

ISO 14000 is a family of standards related to environmental management that exists to help organizations minimize how their operations (processes etc.) negatively affect the environment (i.e. cause adverse changes to air, water, or land); comply with applicable laws, regulations, and other environmentally oriented requirements, and continually improve in the above. ISO 26000 (2010) is intended to provide organizations with guidance concerning social responsibility and can be used as part of public policy activities. It is not intended to prevent the development of national standards that are more specific, more demanding, or of a different type. It is also is intended to assist organizations in contributing to sustainable development. It is intended to encourage them to go beyond legal compliance, recognizing that compliance with law is a fundamental duty of any organization and an essential part of their social responsibility. It is intended to promote common understanding in the field of social responsibility, and to complement other instruments and initiatives for social responsibility, not to replace them.

Epstein and Roy (2001) explain that through a careful identification and measurement of key performance drivers, the strategy implementation process is improved. The framework presented in figure 2.2 below provides a comprehensive approach for examining the drivers of corporate sustainability. This framework provides guidance to researcher on the analysis of these drivers.

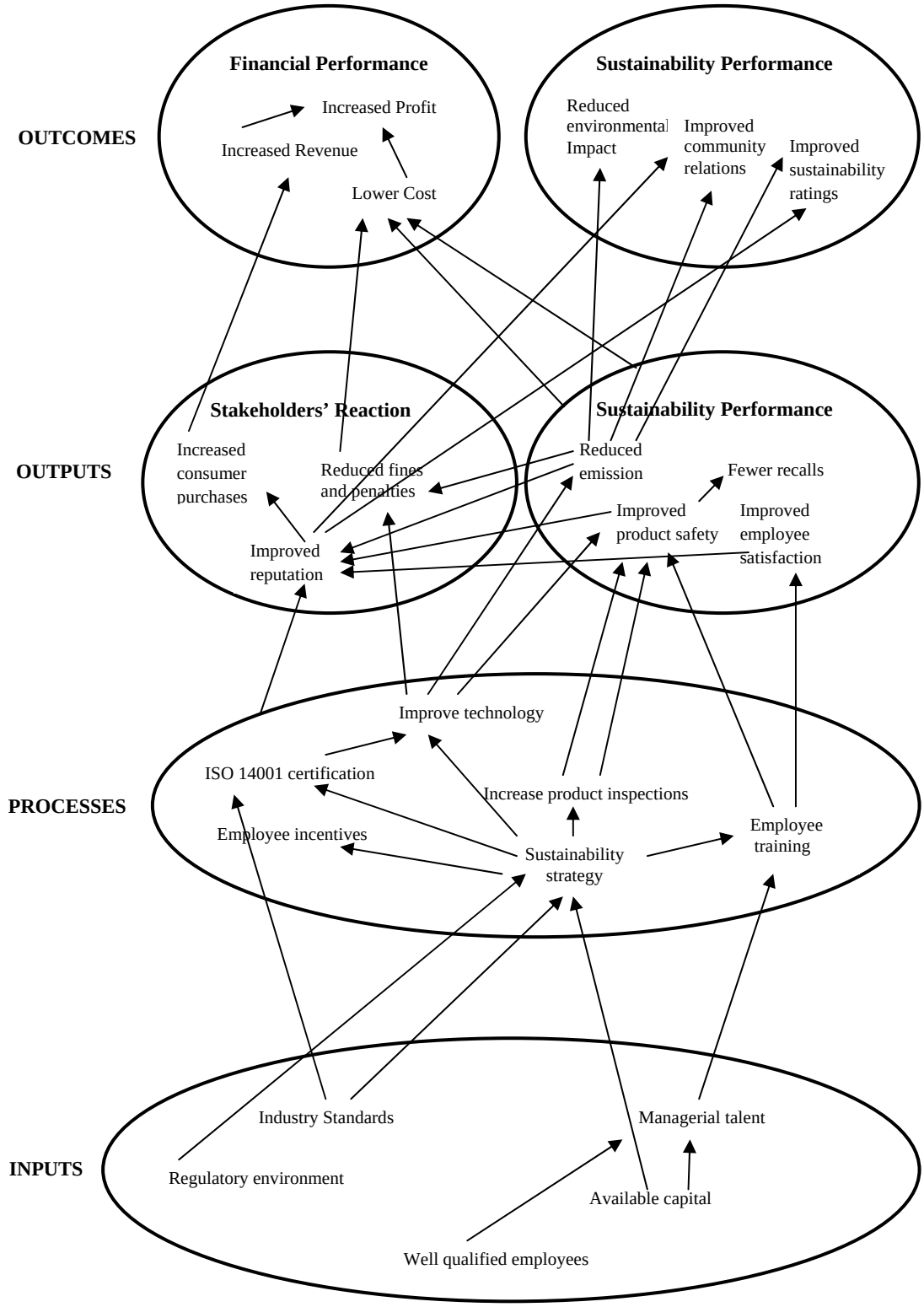


Figure 2.2 Causality of Sustainability Performance Drives

Source: Epstein, 2008: 167.

2.2 Research Framework

The review of the literature suggests the research framework for analyzing sustainability performance measurement presented in figure 2.3. The framework consists of three parts: environment, sustainability strategies and performance. The first part environment analyzes macro level of policies, sustainability concepts, factors and forces. The overall environment has an impact on sustainability strategies therefore; the second part of the framework will address sustainability strategies in the areas identified. The final part of this research study addresses the outcome of these strategies on sustainability performance measurement.

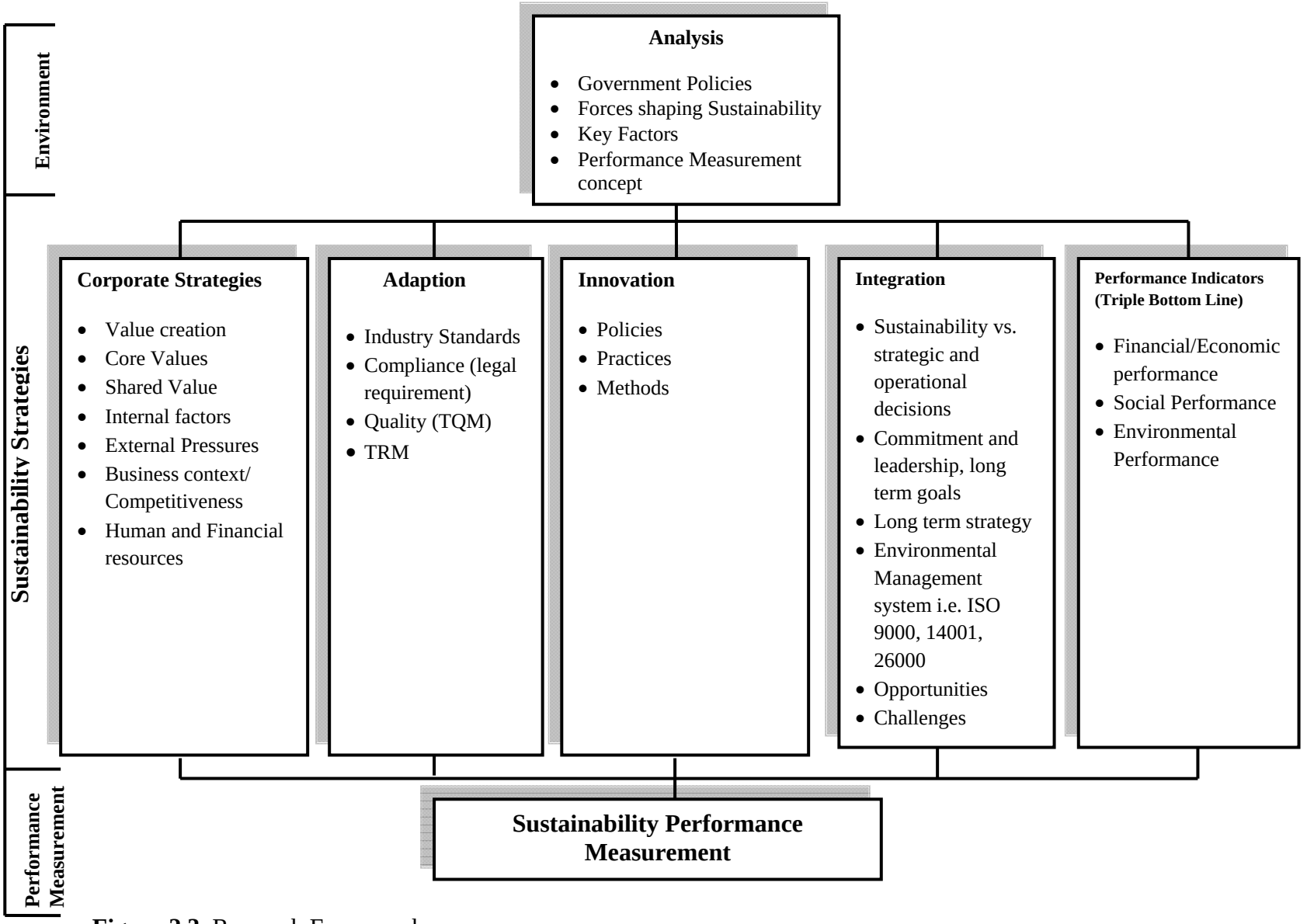


Figure 2.3 Research Framework

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Approaches to This Study

The study used qualitative and explorative approach , a process of examining and interpreting data in order to elicit meaning, gain understanding, and develop empirical knowledge (Corbin & Strauss, 2008). The philosophical orientation of this methodology is a worldview that underlines and informs methodology and methods. This study used a mix of investigative techniques and content analysis as research strategy using multiple convergent methodologies of data collection to develop insight into sustainability performance measurement strategies and practices of international companies.

Mayring (2000) describes Qualitative Content Analysis as “an approach of systematic, rule guided qualitative text analysis, which tries to preserve some methodological strengths of quantitative content analysis and widen them to a concept of qualitative procedure”. Kohlbacher’s (2006) research describes Titscher’s notion that content analysis is "the longest established method of text analysis among the set of empirical methods of social investigation" He also explains that the strength of qualitative content analysis is that it is strictly controlled methodologically and that the material is analyzed step-by-step. Central to it is a category system which is developed right on the material employing a theory-guided procedure. In other word’s qualitative content analysis aims to preserve the advantages of quantitative content analysis but at the same time apply a more qualitative text interpretation.

Grounded Theory, a methodical but unconventional approach was developed by Glaser and Straus (1967) for the purpose of constructing theory from data analysis. This methodology is a way of thinking about and studying social phenomena, as in this case Sustainability Performance Measurement, a phenomena that has been

studied by gathering and analyzing data and applying methods implying grounded theory techniques and procedures.

This methodology adopted for this research will be particularly advantageous way to answer questions in examining a contemporary phenomenon over which the researcher has little or no control. Therefore it was suited to answering the questions of this study. In addition, this method was suitable for bringing out details from the viewpoint of the participants, by using multiple sources of data derived from interviews & questionnaires, content analysis of published data and documents.

A host of key informants were approached by researcher in three international conferences. This strategy was particularly useful because Sustainability in present era is a phenomena and being evolved as a core business strategy for businesses. 80 international companies were targeted for analysis of sustainability development report (data) published used for content analysis. Six companies selected from different geographical location were selected for further analysis through case study. The researcher used social research software (ATLAS.ti7) to analyze corporation inputs, information like documents, surveys, audio, video and pictures to ascertain that sustainability data is verifiable. A qualitative methodology ensured the context of and relationship between sustainability issues is captured.

3.2 Unit of Analysis

The unit of analysis consists of environmental data collected from a sample of 80 corporations. The qualitative inputs were collected from interviews and conference transcripts, published articles, journals and industry reports. The data collected from 80 companies were grouped as environmental indicators. Five vital and measurable indicators (Energy, Water, Emission, Waste, and Recycling) were chosen for this study and then a trend charts were carried for trend analysis. Data was collected for seven years ranging from 2006 to 2012, because sustainability reporting is relatively new phenomenon and in most instance data were available for only three to five years. There are 400 data sets are available for final analysis from the 80 corporations reporting on 5 indicators. The classification of the corporations was done according to Global Industry Classification Standard (GICS).

The GICS methodology (www.msci.com) are designed to respond to the global financial community's need for an accurate, complete and standard industry definition and used by financial professionals worldwide and has been widely accepted as an industry analysis framework. The GICS structure consists of 10 sectors, 23 industry groups, 59 industries and 122 sub-industries. Following 10 GICS classified sectors has been used for data analysis in this study;

Table 3.1 GICS Industry Classification

Code	Sector
10	Energy
15	Material
20	Industrial
25	Consumer Discretionary
30	Consumer Staples
35	Health Care
40	Financial
45	Information Technology
50	Telecommunication Services
55	Utilities

3.3 Reliability and Validity

Reliability and validity was important concerns in this study. Establishing the validity of a qualitative research method required implementing a triangulated evaluation design. In this research, two types of triangulation were applied: methodological triangulation and data triangulation.

Methodological triangulation refers to employing multiple methodologies to gather date rather than relying on a single one. Producing consistent results with the multiple methodologies demonstrates reliability. The used multiple methods of methodological triangulation: interview, observation, and analysis of data and documents gathered from company's published and internal documents.

Data triangulation refers to using a variety of data sources. Consistent data among the various sources indicates reliability. Several methods of data triangulation were applied in the study: spreading the interviews over a period of several months on multiple locations, cross checking information from multiple sources within the industry. Additional data were collected from print and electronic media and interviews were conducted with academics and industry experts.

The data collected for this study came from expert interviews, conference transcripts and selected environmental indicator data from company sustainability reports. The relevant questions were derived from research objectives and literature review. The benefit of attending three global conferences provide the researcher an opportunity meet senior executives, academics, policy makers and subject matter experts in sustainability. Their views and opinions were cross referenced and validated to answer the research objectives. The company data came from their annual published reports validated by reporting externally assured framework indicators, national regulations and international norms. The range of data was set for 2006-2012 (seven years) because companies have different year set as benchmarks and their frequency of reporting may be one to several years but in most cases about five years. This range gave sufficient information to extract comparable and valid data.

The environmental impacts analyzed in this study represent some of most significant global environmental impacts. The indicators selected were reported by companies' in variety of data unit formats that posed a huge challenge for researcher to express it in common units that can be compared. For example measurement of energy units are joules but it was expressed in several units like kilo watt hours (kWh), megagajouls (MJ), Terajouls (TJ), Btu, Watt hours (Wh) etc. Also there was huge variation among company data in terms of consumption. For example a mining company that is highly energy intensive may report The extremely high amount of energy consumption compare to an IT company. All data sets were grouped into intervals analyze trends.

The company data expressed in different units of measurements was converted into following standard measurement units for analysis in this study;

Table 3.2 Performance Measurement Indicators

Indicators	Units
Energy intensity data	Million Gigajoules (GJ)
Water usage data	Million Cubic meter (m3)
Carbon Emission Co2 data	Million Metric Tons (Co2)
Waste to landfill data	Metric Tons
Recycling data	Percentage (%) of Waste produced

3.4 Data Collection and Interpretation

The main source of data collection in this research was qualitative investigation supported by secondary data in form of company reports. While conducting the initial interviews it became evident that a limited number of interviews would not suffice and would not answer research objectives that were seeking to answer a worldview related to sustainability which is a current phenomenon and now being adopted as a core business strategy. It became imperative to seek wider viewpoint from policy makers and industry leaders. The best approach was to attend international conferences which provided opportunity for the researcher to meet global leaders in sustainability, and subsequently investigate and analyze their knowledge and viewpoint. The researcher attended following conferences;

Table 3.3 Conference Attended

Conference Attended
CSR Asia Summit, Beijing, 18-19 September 2012 Theme- Local Innovation for Global Challenges
Delhi Sustainable Development Summit/ World Sustainable Development Forum, New Delhi, 31 January - 2 February, 2013 Theme-The Global Challenge of Resource-Efficient Growth and Development
Global Conference on Sustainability and Reporting/Global Reporting Initiative (GRI) Amsterdam, 22-24 May 2013 Theme- Innovation and Change: for a Sustainable Global Economy

Content analysis and in-depth interviews with executives of international companies complying sustainability practices were conducted. Published reports/data from some 80 companies were collected through Corporate Register, world's largest directory of corporate responsibility (CR) reports, past and present, making it the primary reference point for CR reports and resources worldwide. An interview guide method was applied for majority of in-depth interviews that draws a set guideline to gather information systematically and ensure consistency across all interviews. The issues and concepts identified in the literature review were used to develop the interview guide in order to answer the research objectives. The interview guide used open ended questions as many researchers prefer this approach for its ability to produce rich and original data. To ensure the effectiveness of the interview guide, a pilot test was carried out prior to the main interview phase that led to the necessity of wider respondents and their inputs on worldview were sought.

CHAPTER 4

ANALYSIS, DISCUSSION AND FINDINGS

4.1 Forces Shaping Strategic Initiative for Sustainability Performance

Climate change has become the face of challenges that can only be tackled by coordinated action at global and national levels. The world today must work towards global growth models, both inclusive and sustainable, by building resource efficient and resilient economy. The leaders of the world at Rio+20 summit (June 2012) acknowledged that green economy in the context of sustainable development and poverty eradication would lead to environmental sustainability and better management of resources. It was however, a poignant reminded that the ambitious goals set in 1972 remain unrealized due to lack of meaningful consensus. “The Future We Want” document of Rio+20 mapped out the entire terrain on which human society must now traverse to ensure inclusive and equitable growth across the globe and proper protection of the earth’s vital ecosystem. It desires inclusive and equitable economic growth, greater opportunities, and reduction of inequalities across the globe. It was urged to share opinions on how the international community should approach Sustainable Development Goals (SDGs). SDGs are objectives that have been set out, including and in addition to the Millennium Development Goals (MDGs) for 2015.

Achieving these objectives requires committed and urgent action to be undertaken by the global community. A study on material flow by United Nations Industrial Development Organization (UNIDO) material consumption is also correlated to increasing carbon emission. Since Rio+20 was able to attract all stakeholders, including government, business, research and academia, and civil society, there is now a need to define collectively a roadmap by which human society can attain the path of sustainable development. Sustainable Development is now clearly the central objective of development policy around the world and the guiding principle for advancing human activities.

4.1.1 Defining the Future: The Global Challenge of Resource Efficient Growth and Development

The world is faced today with serious threats of climate change, natural disasters, and pollution as a result of the unsustainable utilization of the scarce natural resources whilst the world population grows at a tremendous rate. Climate change is the most challenging issue of today that would play an instrumental role in defining the future, humanity want. There is need to tackle social issues along with ecological issues. Governments need to do brutally honest assessment of their own limited success on the path towards sustainability. There is strong argument that the only way to address global challenges is to resolve them together as a global community. Further, efficient organizational structures are necessary to achieve resource efficiency i.e. better organizational frameworks are important for improving resource efficiency and knowledge dissemination, especially for poorer countries where the role of the large population of poor people and young citizens as potential human capital resources that are currently underutilized and can be major drivers of development.

While the international community is aware what needs to be done, the lack of political will must be overcome if any real action to be taken for the criticality of commons, but differentiated responsibilities and good governance parameters, which give developing countries the scope to grow in a sustainable manner. Delay and inaction pushes countries and the world closer to the tipping point. Politicians are often more comfortable with incremental change and cannot deal with big steps required to address a global problem like climate change. Therefore, the concept of sustainable development that focuses on achieving a balance among the economy, society, and the environment under the principle of corporate governance will be the answer that enables mankind to live together sustainably and happily.

In current world order sustainability issues are going to be its integral part. The 21st century society and its economy are rapidly changing in response to new technologies. Global economy is worth 70 trillion (excluding externalities) and its three fourth is in private sector hands. Corporations have leading role to play with three fourth of global economy in its hands and strategies beyond financial aspects and GDP. Sustainability is about intergenerational equity. Society changes its

perception from time to time on issues i.e. slavery, child labour, smoking etc., that were acceptable practice now have become unacceptable to society, so is perception on sustainability is gaining huge momentum. Corporation 2020, a think-tank has designed set of principles and future role for the corporations described in the table below.

Table 4.1 The New Principles of Corporate Design

The New Principles of Corporate Design
1. The purpose of the corporation is to harness private interests to serve the public interest.
2. Corporations shall accrue fair returns for shareholders, but not at the expense of the legitimate interests of other stakeholders.
3. Corporations shall operate sustainably, meeting the needs of the present generation without compromising the ability of future generations to meet their needs.
4. Corporations shall distribute their wealth equitably among those who contribute to its creation.
5. Corporations shall be governed in a manner that is participatory, transparent, ethical, and accountable.
6. Corporations shall not infringe on the right of natural persons to govern themselves, nor infringe on other universal human rights.

Source: Corporation 2020, 2013.

As key forces in society, organizations of all kinds have an important role to play in achieving sustainability goals. Yet in this era of unprecedented economic growth, achieving this goal can seem more of an aspiration than a reality. Sustainable development is both a critical enabler of corporate license to operate, and a key value driver embedded into every aspect of business. Sustainable development is an integral part of the corporate strategy. It is both a critical enabler of private sector license to operate, and a key value driver embedded in every aspect of business.

Raising the sustainability bar will need new green growth strategies. People awareness is on rise and some countries have taken major steps i.e. introducing carbon pricing. Asia is particularly vulnerable to climate change due to large population. Better energy needed for the “bottom of pyramid”. Some business solutions are available to address the challenge and there are market opportunities to address with the right business model thrusted by innovation and efficiency. Answer lies in smart grid technology and efficiency for sustainable cities. Value creation drives (innovation, resource efficiency, risk mitigation, talent retention) leads to better sustainability management. Climate change urgency reminds all stakeholders that “objects in mirror are closer than they appear”

China’s proposed carbon market is a new paradigm for business and it is yet to be seen whether it will be able to finance the deployment of technologies needed to transition to a low carbon economy? For businesses there are other climate change risks beyond carbon austerity and they are adopting a business assurance strategy that turns carbon into asset. The Chinese government is preparing 7 regional pilot carbon trading schemes and a national scheme is expected to start in 2015. This follows similar schemes in Japan, New Zealand, Australia and upcoming scheme in Korea. The World Bank’s Partnership for Market Readiness Program is helping 15 developing countries to build market based emission reduction instruments including India, Indonesia, Thailand and Vietnam. By 2020, when a new global agreement on climate change will be implemented, many businesses will be participating in multiple carbon market. For achieving credible emission reductions harmonized implementation is important for equity and confidence. It also requires companies to provide a reliable system for monitoring, reporting and verification. Value for credit increases if there is high level of transparency and it depends on the high quality of data. A clean, clever and competitive future framework should start with Planning (climate change adaption, policy modeling, carbon due diligence), Informing (stakeholder communications, carbon disclosure, green products), Measuring (carbon footprint, life cycle assessment, data systems), and Managing (energy efficiency, emission reduction & trading, monitoring & assurance, carbon capture & storage).

Big businesses have the resources; expertise and ability to support local innovations that help provide solutions to global sustainability challenges. The key

questions corporations need to address are; how innovation leads to solutions to sustainability challenges globally and how organizations support innovative sustainability initiatives and overcome challenges. Innovations can contribute to a better world as a result of the development of eco-friendly products that fully utilize natural resources whilst reducing energy consumption and pollution.

4.1.2 Public Policy Debate on Value Integration

There has been call over the years to develop regulatory framework for mandatory sustainability reporting. The idea draws lessons from research in different fields and vast amount of literature which draws distinction between regulated and voluntary corporate disclosure. To influence policy at the national or intergovernmental level, information is required on environmental and social impacts of business. It should not be the question that a company should be accountable for certain sustainability performance but whether a company's performance supports public policy targets or a company is able by its operations and business models to support the global policy goals of policy makers like governments, climate change experts etc. For this to happen it needs to be defined very clearly what the goals of government are and what it wants the companies to report on otherwise it will be a pile of indicators, data collection, and confused management approaches, whether they are important or not because the intention of sustainability accounting that is totally different to financial accounting. There are lots of sustainability initiatives, not necessarily serving public policy goals.

The characteristics in public policy rules or law are very important in explaining why some norms are more influential than others. The common understanding of the regulation on which law on the one hand are system of rules quantified by state legislation and enforced by coercive methods. On the other hand the practice which is not quantified by state legislation is conceived as being outside boundaries of state law, so it is voluntary. In such case corporate sustainability is either mandatory or voluntary. There is data flow process between governments and private organizations flowing through all sorts of regulations and of policy framework. From companies point of view when it comes to reporting is what is the required output or required results? In financial report the required result is to understand and to compare whether

a company is financially healthy so different companies can be compared. It is essential that there is a standard practice in sustainability, i.e. euro is euro and dollar is dollar.

Regulation of corporate reporting leads to reliable, neutral and complete information. On the other hand voluntary corporate reporting is blamed for biased, incomplete and inconsistent reporting. The consequence is therefore call for regulation of sustainability reporting with the understanding that this would improve the quantity and quality of sustainability reporting. The findings in the literature have shown a great deal of noncompliance in different issues and contexts. Often there is very low level of reporting on sensitive issues like, health and safety, equal opportunity etc. This may occur in spite of mandatory or obligatory requirements but failing to compliance has no consequence and leads to complacency.

At the same time some international norms are created by international and private organizations and some hybrid models that are very influential and are accepted as standard disclosure. It is thus becomes important to understand and make sense of this regulation landscape and the lessons that can be drawn from this situation. Policy makers can use ideas drawn from different fields to understand the dynamics of sustainability reporting regulation. For example in a comparative study of Spain and UK, it was found that there was less compliance in Spain even with the formal law while in UK there is great deal of compliance in the absence of formal law, but from norms emerging from practices. The ideas come from international laws, international relations and governance because in sustainability practice, multiplicity of norms exists not mandated by state. The distinction then becomes evident that norms which are the convergence of expectations of acceptable patterns of behavior and legal rules quantified by the state legislation. The law can arise from state legislation but also from less formal system of rules.

The dynamics of regulation are very important to understand the influence of law. The issues that have impact on the normatively or the usefulness of the law can be from lifecycle of norms, process of mergers and acquisitions and evolution of norms until they are taken for granted. The state is not the only regulating actor today. Stakeholders' interests have shifted the balance of corporate power into golden age of regulation because there are multiplicity of actors besides state competing for creating

and influencing norms. The effort to make sustainability reporting compulsory should also take into account authority beyond state in shaping up norms leading the roles of different actors because it can build upon on the previous norms while state actors could fail trying to reinvent the wheel. Financial reporting have universal standard framework of practice while non-financial reporting has several frameworks which doesn't conform to any single standards and also they are difficult to compare. The initial goal of sustainability framework are to make companies attractive for investors, the second goal or the intended outcome are to make companies transparent to stakeholders however these are not the ultimate goals of the sustainability reporting. Voluntary attitude of companies doesn't necessarily work and they need some kind of policy guidance.

One of the key questions then remains whether to go for mandatory reporting or rely in non- legally mandated initiatives such as GRI and several other initiatives. How a company treats its employees, trust and happiness can't be regulated. The whole idea that there is distinction between mandatory and voluntary is difficult to tie down and remains in a fluid situation. Some industries do lot of voluntary reporting because there is strong industry cohesion that gives the impression that reporting is mandatory so the whole distinction between what is required and what is not required remains very fluid. The development of reporting norms is a very complex process and in the absence or the appetite to regulate on the global context as it exists in global context and thinking in absence of how non state regulation might allow companies to realize accountability becomes an important question. For example GRI is a piece of private regulation which has become widely recognized as industry standard alongside other regulatory processes.

EU is the leading example of taking lead in regulating non-financial reporting. Denmark in particular has taken the similar initiatives and since 1996 government authorities are required through covenants to issue a statement on each green account, a verification statement in which they comment on the quality of green compliance. Experience shows that while it may be useful for internal purposes, it may also encourage management behavior and their attention to environmental management system. On the other hand experience also shows that there are no or very limited external demands for those disclosures. There is also audit requirement on non-financial reporting with same level of assurance. These requirements are important for

CSR practitioners and so far such covenants have helped develop CSR policies. It was also found that over two thirds reporters report on qualitative information and only one third reporters report on quantitative indicators. Investor relations departments are not usually responsible for CSR reporting but it is just an add-on management strategy. In a large user survey it was found that CSR was still the least demanded item in company reporting i.e. there limited demand for CSR disclosure. There is need to link CSR to stewardship of management and links between different policy instruments and consider disclosure as part of package.

It is argued that private regulations are no less important than the government regulations and they are formally owned by the organizations. There are mechanisms that govern the activities that are actually super national in nature and they come from international agreements like Kyoto agreement or regional agreements like EU level agreements etc. What the industry has got, particularly in the development of carbon market that there is defacto' governance over things that are coming from quite a different regulatory space than state legislation. They are also coming from other market mechanism which gives them both strengths and weaknesses. If the carbon price rise or fall there is a play through. On the far side GRI is a voluntary governance of practices and so are all those product certification schemes that allow companies to use their logos on certified products that influence and shape consumer preference and codes of conduct because it represents environmental friendly credentials. Codes of conduct are in influenced by different dynamics i.e. shareholder dynamics and market dynamics which are different and have weak or strong connections with formal legal regime and leading to different degree of interaction with the state. The distinction between public and private policy and hybrid model- International standards are such hybrid models.

There are three things companies need to have in accountability regime and all three needs to be in the same intensity and frame together at all time. They are Performance, Reporting of the Outcomes, and Sanctions. Often companies get distracted by reporting of outcomes rather than actual performance. The literature suggests that there is inverse relation between actual environmental performance and environmental reporting. The final thread which is often forgotten about in the accountability is sanctions. If companies don't apply sanctions they are not in the accountability

situation but all they got is transparency. This is where formal state regulation has immense advantages because there is a possibility of sanction point. However, in a lot of other areas of private regulation, the sanction point might be very soft.

4.1.3 Development-Environment Relationship

Some recent research have hypothesized that the relationship between economic growth and environmental quality, whether positive or negative, is not fixed along a country's development path; indeed it may change sign from positive to negative as a country reaches a level of income at which people demand and afford more efficient infrastructure and a cleaner environment. The implied inverted-U relationship between environmental degradation and economic growth came to be known as the "Environmental Kuznets Curve," by analogy with the income-inequality relationship postulated by Kuznets.

At low levels of development, both the quantity and the intensity of environmental degradation are limited to the impacts of subsistence economic activity on the resource base and to limited quantities of biodegradable wastes. As agriculture and resource extraction intensifies and industrialization takes off, both resource depletion and waste generation accelerate. At higher levels of development, structural change towards information-based industries and services, more efficient technologies, and increased demand for environmental quality result in levelling-off and a steady decline of environmental degradation as seen in the Figure below

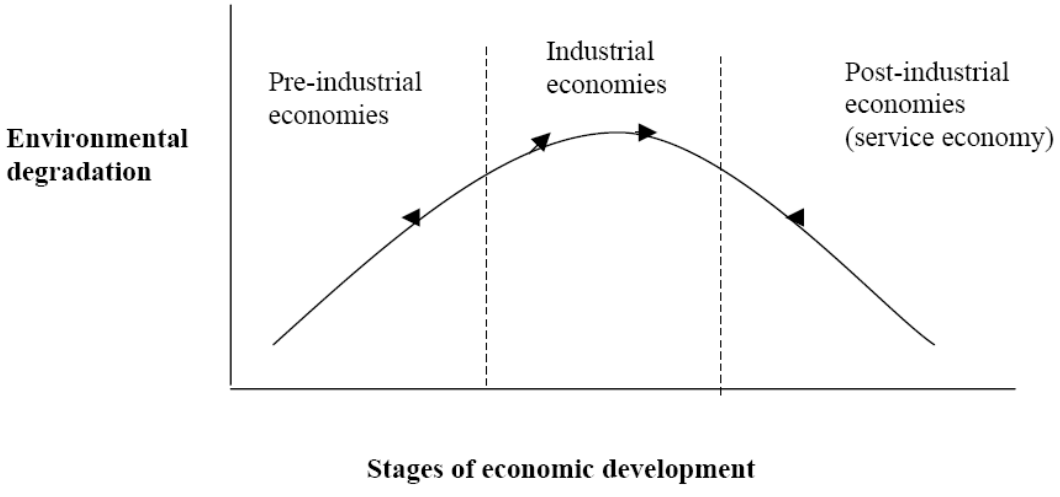


Figure 4.1 Environmental Kuznets Curve

The relationship between economic growth and environmental quality– whether inverse or direct -- is not fixed along a country's development path. Indeed, as hypothesized, it may change as a country reaches a level of income at which people can demand and afford a more efficient infrastructure and a cleaner environment. This implied inverted-U relationship between environmental degradation and economic growth came to be known as the "Environmental Kuznets Curve," by analogy with the income-inequality relationship postulated by Kuznets (1965, 1966).

4.1.4 Economy and Environmental Sustainability

The relationship between economic growth and the environment is, and may always remain, controversial. Some see the emergence of new pollution problems, the lack of success in dealing with global warming and the still rising population in the Third World as proof positive that humans are a short-sighted and rapacious species. Others however see the glass as half full. They note the tremendous progress made in providing urban sanitation, improvements in air quality in major cities and marvel at the continuing improvements in the human condition made possible by technological advance. The first group focuses on the remaining and often serious environmental problems of the day; the second on the long, but sometimes erratic, history of improvement in living standards.

These views are not necessarily inconsistent and growth theory offers us the tools needed to explore the link between environmental problems of today and the likelihood of their improvement tomorrow. For many years, the limited natural resource base of the planet was viewed as the source of limits to growth. This was, for example the focus of the original and subsequent ‘Limits to Growth’ monograph and the efforts by economists refuting its conclusions. Recently however it has become clear that limits to growth may not only arise from nature’s finite source of raw materials, but instead from nature’s limited ability to act as a sink for human wastes. It is perhaps natural to think first of the environment as a source of raw materials, oil and valuable minerals. This interpretation of nature’s service to mankind led to a large and still growing theoretical literature on the limits to growth created by natural resource scarcity.

Part of the disagreement over growth has it origin in semantic confusion. When businesses and governments talk about growth they generally mean economic growth. When environmentalists talk about growth they most often mean physical growth. But economic and physical growths are not the same thing at all. Economic growth is acceleration in the production of economic value. Businesses usually like economic growth because it increases business opportunities and tends to reduce business risk. Governments usually favour economic growth because in the upswings of the business cycle it is associated with increases in employment, voter optimism and good electoral outcomes.

Physical growth of the economy means it spreads over more area or has a larger material throughput or has a larger stock of physical products or buildings or infrastructure. Businesses in the resource industries like physical growth because it generally increases the demand for their products. Environmentalists dislike physical growth because it correlates with environmental damage and resource depletion. Continuing the economic growth needed to meet socio-economic development needs of all, raises the question whether the natural resource base can support the implied levels of production and consumption activity indefinitely. The ability of global environmental resources to continue to sustain economic activity indefinitely is dependent on its environmental carrying capacity. This is in turn determined by two main factors the natural resource endowment (or “natural capital”) and patterns of resource use.

4.1.5 Innovative Strategies in Sustainability Management

Innovation is about creative management that makes organizations more agile, effective and efficient. Improving the sustainability of operations is made difficult due to the persistence of short-term thinking, the need for immediate results, cost saving and lack of understanding of the sustainability practices. Innovation is needed because the pace of economic, technological, social, cultural and political change is increasing. The accelerated rate of change has challenged the traditional bureaucratic form of organization to develop new methods for rapidly changing organizational strategies. Organizations must change rapidly to keep pace with change in their environment. Networks of organizations are now replacing older vertical integrated hierarchies and

national boundaries are less important in private sector. International cooperation is becoming more important due to global economy and policy issues like environment that cross national boundaries.

Successful innovation is often incremental and small scale because the factors conditioning the success of innovative practices vary according to the organization's internal capacity, external environment and goals or mission. "A strategy attempts to delineate the resources that will be used to pay for specific activities designed to accomplish specific objectives." A strategic planning exercise typically involves an organization-wide initiative to reformulate goals and develop new methods of achieving those goals. All organizational innovation must begin with a strategy incorporating focus on sustainable product development and services. Reengineering, the business process of fundamental rethinking and radical redesign is able to deliver dramatic improvements in performance. TQM collaborates with suppliers, put emphasis on continuous employee analysis, and engage in close communication with customers to identify their product preference and expectation of quality. Team Management and Outsourcing add on to strategic tools for innovative sustainability. Benchmarking "a rigorous yet practical process for measuring organization's performance and processes against those of best-in-class organizations, both public and private, and then using this analysis to improve services, operations and cost positions dramatically" (Bruder & Gray, 1994) is the culmination of strategic initiative that involves finding, adapting and implementing best practices.

4.1.6 Resource Efficiency

The need for globally effective action and focus on transfer of resources and technologies as a measure to bring the gap between developed and developing nations will raise global awareness to follow a sustainable path and renew the green revolution initiative help the poor communities and lifestyle changes that is more sustainable. There is need for a low carbon leap frog development pathway.

Comparing two extreme examples, Japan, is facing severe energy crisis due to the recent nuclear disaster, but since then has been trying to widen the scope of renewal energy options in the country through Nationally Appropriate Mitigation Action (NAMA) and Joint Crediting Mechanism (JCM). The focus is on collaboration

and Partnerships between institutes, companies and academia for sustainable development. Bhutan on the other hand has been successful in providing 95 percent clean water and 80 percent electricity to its population, however there is need for a diversified energy portfolio. Coping mechanism for water saving measures, investment in water storage capabilities, mix of renewal technological options, and funding mechanism to conserve and preserve forest areas were some of the suggestions for climate protection and energy security.

Education, international cooperation, and political will can be catalyst to resolve issues related to resource security. Capacity building, integrating sustainability into small and large scale farming, and developing market based mechanisms as key aspects. Small island perspective of climate change and impact of action in these areas, highlighting the need for wider renewable energy options in small islands through knowledge sharing. The focus on the Blue Economy-protecting the oceans, which are otherwise a neglected resource.

4.1.7 Natural Capital Valuation and Measurement

It is an emerging discipline that demands valuation of the externalities. It is dynamic concept but what changes it would bring? Externalities refer to the positive or negative consequences of an economic activity that are experienced by third parties. ‘The Economics and Ecosystem and Biodiversity’ (TEEB) study pioneered this approach and did attempt to explore externalities at provincial, national and international level. At business level exploring the third party impacts of doing business as usual and challenge of not being able to measure and report any impact companies inflict on public capital. Companies tend to measure what typically belongs to them i.e. their assets and capital. The TEEB for Business Coalition is a global, multi stakeholder platform for supporting the uptake of natural capital accounting in business decision-making. The coalition is the business application of G8 and United Nations Environment Programme (UNEP) supported programme. Its activities focus on raising awareness of the business case for natural capital accounting, research and supporting development of harmonized methods for measuring, managing and reporting environmental externalities in business.

The paramount question is; how one can value nature? Without any attempt to put meaningful value in terms of human comprehensible term, the society is in danger of losing precious and vital life resources. Different industry has different impact on the way it uses different resources and in majority cases impacts could occur from use of supply chain for example raw material production which is not taken into account. Measures like electric cars and solar energy can mitigate little of these impacts in relation to biggest impacts that have occurred and are already very far away. In this context, sustainability really needs to be measurable. There is immense competition among businesses but they are also coming together to cooperate and find solutions for challenges of externalities. The critical question comes back though, where measurement does starts? The skeptics argue that humans should not try to put dollar value on natural capital which will run into redundant monetary value with passing time because of shifting value of monetary system over time. Natural capital is finite resource and it has the natural connotation that can only have natural and spiritual value as traditionally attached to it. Not everything can be valued and measured for example value of leadership, customer satisfaction, happiness, human rights and other social issues that are intangible.

However, there is a challenge to push limit to quite the contrary in terms of sustainability. The only way to make what is invisible to visible is to put dollar value on it. The value should be part of the national account and governments are pushing the agenda and interested in knowing what is happening at the company level. The consumers would want to know the actual value at the product level, whether the price they are paying reflects the externalities embedded in the product. Governments in both developed and developing countries are taking lead and regulators are asking companies to disclose or explain i.e. either you disclose or explain why you cannot do it. There are certain issues that require mandatory disclosure. There is no leadership challenge but the question is followership. There are several good companies setting examples and the onus is on rest of the companies to follow the lead. Companies do not manage things which they don’t measure.

Business leadership is now obliged to measure environmental and social impacts in addition to its financial impact. Businesses have enormous power to contribute good things that was camouflaged by material needs it was busy

addressing, in crude terms the dark side of business. The enormous power of business comes with responsibility and needs to cooperate with governments and other stakeholders. Human beings are very human centric so there has been lots of focus on the social issues but less on environmental issues. For example in US 98.5 percent of the philanthropic expenditure is spent on social issues while less than 2 percent goes to environmental issues. It time to look at the planet because without planet there would be no society. In future scenario, change will happen by design or disaster. “The community is not merely a stakeholder in the business but its very purpose” (J N Tata) was the old social corporation in 1920s. Drawing a lesson from this, Corporation today have the huge opportunity by turning around and visioning that corporations are not merely engine of profitability but much more, they are engines of delivering wellbeing and change across society.

Puma, a global corporation set an example by putting value on its environmental footprint and producing world’s first Environmental Profit & Loss (EP&L) account. The expert review gave it an encouraging effort in the right direction and confirmed the process as a logical way to frame environmental issues for business. The current EP&L methodology was viewed as appropriate to support strategic decision making, provide insight into natural capital risks faced by business, highlight potential opportunities and act as a basis to communicate a company’s impact on the environment to stakeholders. The largest challenge for the business community will be understanding, how best to standardize the principles and the approach to producing an EP&L and facilitating widespread adoption.

Table 4.2 PUMA's Environmental Profit & Loss (EP&L) Accounting: World's First A Case Study

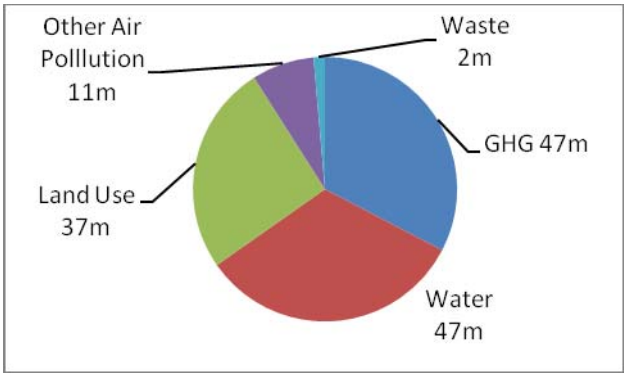
PUMA's Environmental Profit & Loss (EP&L) Accounting: World's First A Case Study

"An Environmental Profit & Loss Account is a means of placing a monetary value on the environmental impacts along the entire supply chain of a given business." (PUMA, 2011)

Inspired by TEEB study, Sportswear brand PUMA published first ever EP&L report in November 2011, calculating the environmental impact for greenhouse gas emissions (GHG), water use, land use, air pollution and waste, generated through the operations and supply chain of PUMA, which was valued at €145 million in 2010.

The EP&L is considered a key first step in the development of a natural capital accounting framework. It is considered was a step in the right direction and the process as a logical way to frame environmental issues for business. The 2010 EP&L provided a view of the environmental impact of producing and selling PUMA's products for the first time.

Overall Impact €145million	
Largest Impact:	
GHG	33%
Water	33%
Other Impact:	
Land Use	25%
Other Air Pollution	7%
Waste	2%



The overall impact of this exercise can't be put into context as no other business has yet publicly disclosed similar information; however the scale of impact is undeniable. These transparent findings reveal where companies have to direct its sustainability initiatives in order to make real improvements.

Placing a monetary value on its impacts on natural services has helped to illustrate the potentially negative impact depleted ecosystems can have on a business' future performance. "Standardization of the EP&L approach should help broader adoption of the EP&L concept."
In addition, the EP&L needs to align with other efforts like WBCSDC, GRI, TEEB and work as part of a bigger strategy.

Natural Capital Management (NCM) refers to the sustainable management of a company's demand for natural resources and other ecosystems services, as well as the business value chain's impacts on their future supply. The following assessment by TEEB presents a very compelling business case and the urgency required to address NCM.

Table 4.3 The Rationale for NCM

The Rationale for NCM
• We need to value natural capital/BES explicitly because we cannot manage what is not measured.
• The core reason why biodiversity loss and ecosystems degradation are escalating is that the value of their services is largely invisible to decision makers in business and government.
• The lack of prices and property rights for BES has resulted in *externalities*, where uncompensated or "not agreed to" costs are imposed on nature because of economic activity.
• The impacts on biodiversity and ecosystems due to externalities are severe and rapidly escalating.
• Primary forests have completed disappeared in many countries. Every year, we lose several million hectares of forest, mostly in Latin America, Southeast Asia, and Africa.
• Since 1900, the world has lost almost 50% of its wetlands, and 50% of our coral reefs are either destroyed or severely damaged.
• 80% of commercial fish stock are fully exploited, overexploited or depleted. At current rates, there will not be any commercially viable stocks of fish by 2050.
• Around 85% of agricultural land has been degraded due to unsustainable agricultural practices. Every year, 12 million hectares of land are lost to desertification.
• Overall, two-thirds of the world's water and land ecosystems are now degraded significantly. The collective cost to the global economy of mismanaging natural capital is US$6.6 trillion per year (11% of GDP) and is expected to increase to US$28 trillion in 2050 at current rates.

Table 4.3 (Continued)

The Rationale for NCM
• The world's 3000 largest publicly listed companies are estimated to have caused US$2.15 trillion in environmental damage in 2008, in a report prepared by Trucost for UN Principles for Responsible Investment (UNPRI)/UNEP.
• Natural capital valuation can help create support for new tools and techniques to value natural capital for business decision-making.
• NCM, which is the business innovation to enable natural capital valuation, can mitigate and reduce the impacts on nature due to third party/public good externalities.

Source: Nidumolu, 2013.

4.1.8 Integrated Reporting

There has been a lot of consultation about integrated reporting, but the concept is either not fully understood or considered too challenging to adopt. A general definition of the concept offers little in the way of guidance, a report to reflect connection between economic, social, environmental, government and financial factors and their impact on the long term performance of a company. How should companies approach this, and what are the best ways to start the process?

The International Integrated Reporting Council (IIRC) framework states that Integrated Reporting "<IR> is a process that results in communication, most visibly a periodic "integrated report", about value creation over time. An integrated report is a concise communication about how an organization's strategy, governance, performance and prospects lead to the creation of value over the short, medium and long term. An integrated report should be prepared in accordance with the International IR Framework." (http://www.theiirc.org/)

The role and implications of integrated reporting for the advancement of sustainability poses questions of logic like progression or regression, and what would be its current and potential impacts on the sustainability landscape. Social and environmental accounting preceded integrated reporting. Companies embarking on

sustainability reporting should develop a framework of reporting by gaining management support. It is also important to obtain acceptance by business units and provide guidelines. Ongoing communication should be channeled to keep everybody on the right track and structured process to implement.

There are now 6000 corporations submitting reports incorporating the GRI measures. Reporting has become professionalized and de facto across many organizations. While this is encouraging, there are around 82,000 multinational companies across the world, so there is still a lot of convergence to do. GRI G4 is guidelines for sustainability reporting and integrated reporting is an integrated version of financial reporting and sustainability reporting combining two comprehensive reports into a report focused on value creation. Out of 80 corporations analyzed for this study, 56 corporations or 70% reported using GRI framework for annual sustainability reporting. This is a huge step forward towards integration of financial and non-financial reporting. 23 corporations out of 56 corporations or 29% also reported adoption of UNGC principles in addition to GRI disclosure. The figure below gives a snapshot of the reporting frequency that reveals GRI to be the most adopted framework.

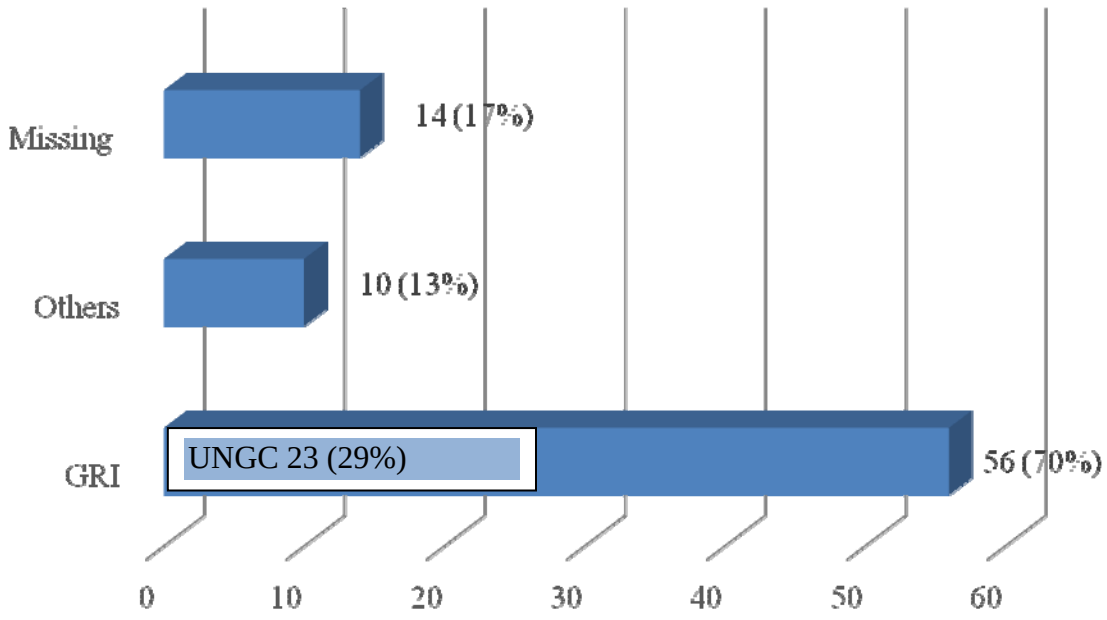


Figure 4.2 Sustainability Reporting Framework Compliance (n=80)

Value creation is paramount in integrated reporting. The quality of non-financial information needs to reflect the interest of a wide range of potential stakeholders, which can change from time to time. It is usually not driven by legal or regulatory requirements or specified by accounting standards. It is also not disciplined by external audit and presented without widely accepted metrics. It is difficult to compare such information with peers and presents possibility of manipulation. There is now closer links between cash flow indicators and environmental and social performance and the relevance for integrated reporting shows that it might become mandatory to achieve tangible value creation.

4.1.9 Academic/Theoretical Underpinning of Integrated Reporting

Academic contribution sustainability sector is of vital importance but education sector's response is not able to keep pace with rapidly changing sustainability landscape. It is clear though that integrated reporting is developing very rapidly. Academic can and should play primary role in the future development of integrated reporting. Corporate are adapting at a faster pace with sustainability culture that also needs to be integrated into core education If a companies have to report in an integrated manner, you have to think, plan, and implement decisions in integrated manner therefore education should also be conducted in an integrated manner. Teaching and managing needs to be done in an integrated way, what should be happening at the end of management cycle, the systems, processes, education, training, management decisions should be around integration for enforcing sustainability culture across the board.

The current IIRC consultation draft is a dynamic document and is being continually developed. For future development as effective as they can be it is absolutely crucial that they are developed on a very solid evidence based context. Academic analysis can provide theoretical and empirical analysis and insights upon which evidence based practice can be developed. Sustainability issues are incredibly complex. A context specific theoretical insight helps to develop broader theoretical understanding. Theory is used to define interrelated concepts that provide understanding of how phenomenon works. From this perspective we all use and rely on many theoretical understanding all the time. In sustainability, theory provides us with the

understandings that the dynamics within three main spheres of sustainability (Economic, Social and Environment spheres) operate in fundamentally different manner. For example within the Economic sphere the very complex financial and accounting practice leads to market mechanism that allows financial reports to be accepted in widely accepted currency so things can be quantified and compared to each other.

In Environmental sphere the dynamics of different components are fundamentally different, therefore multifaceted nature of different environmental impacts and interactions are almost impossible to conceive and put into operation. Theoretical insights from financial accounting alone cannot capture the added complexity arising from environmental and social complexity and trying to provide an integrated report that looks through all three areas. Therefore in further developing and defining integrated report, it is necessary to have expertise that draws knowledge from not only financial accounting sphere but from environmental and social sphere. It is a complex interplay between data analysis, theoretical insights and developments in policy and practice into the multifaceted nature of the different capitals that the integrated <IR> report consultation draft mentions.

Integrated reporting narrows down the set of priorities and each of them needs to be linked to the bigger picture. It is one of the important tools that will help business to devise meaningful measures. In April 2013 the Norwegian government passed legislation, requiring large companies to provide information on how they integrate social responsibility into their business strategies. On 1 June, newly-passed regulation on sustainability reporting came into force in Norway. This represents an important milestone in the regulation of corporate transparency.

Integrated report ironically is produced primarily for Investors, while other stakeholders are at the periphery which can impact on the true value creation leading to positive and negative effects i.e. also value destruction. Investors can be of different types apart from financial investors, they are not a homogeneous group so the assumption could be problematic. Whether sustainability and CSR are core functions of organization and can be integrated with financial performance is constantly in review. Although the focus suggests the notion of inclusiveness, the focus is on investor so how integrated report would be different than annual report and

stand-alone report. The literature challenges about reliability, relevance, representation and truthfulness is also questioned and how integrated reporting would improve social accountability of business?

4.1.10 Material Aspects and Boundaries

Material issues, according to the Global Reporting Initiative (GRI), are those that "have a direct or indirect impact on an organization's ability to create, preserve or erode economic, environmental, and social value for itself, its stakeholders, and society at large." Materiality focus is at the heart of new GRI (G4) Guidelines. Materiality forms the basis of reporting as it provides a view to what the stakeholders deem to be important (the source of material risk for company and how they are managed and monitored) and is strategic to business. Material areas of focus that represent either a risk or an opportunity for organization to create and sustain economic, social or environmental value for itself, its stakeholders and society are the core of value creation.

The materiality of an issue to an organization and the materiality of an issue to society are not always same but current disclosure and analysis don't tend to distinguish between them however, these are not always the same. For example, negative externalities that generate no immediate costs for a company may not be material to a company; however, these externalities may be directly material to affected stakeholders. Further because many analysts make independent estimations on materiality i.e. analysts decides how material it is and whether an issue is material to an organization?

For example, a food and beverage company must look at how water is included in their business strategy and how it is monitored and managed. Water in this case is material issue related to externality of environment, a cost (positive or negative) that is not captured within the economic system through prices. When it comes to the reporting aspects, investors would like to see not just volume of water usage or the efforts to improve water use efficiency, but also the operating environment on the plants on which the company operates and whether any of the plants in water scarce or potentially water scarce areas due to climate change.

The purpose of environmental management and regulation is to compensate for externalities. Issues of Materiality are the key issue in integrated reporting identifying relevant matters (things that affects future value creation). Social and environmental disclosures are about efficiency and using the term of sustainability in itself is a bit of green wash in itself. It's looking forward into the future and looking at the risks. Its' not just looking at the past years performance but looking into the future which is the key added value.

A materiality matrix demands a lot of variables that may be out of company's control i.e., biodiversity, education, child labour issues. The company is not separated from the society so it has to engage in dialogue with society and put things in perspective which is not under its control. Companies don't report on impacts because it's not within their control of ownership and context (Bangladesh garment factory disasters). There is great shift in equation of balance of control between government and company through engagement of UN. The thinking now is that companies are responsible for their own impacts and through various guidelines (EU, OECD, UN, GRI) companies are required to put in place processes where they identify the impacts, and the reporting framework reflects that change.

Table 4.4 Materiality Assessment Framework

Internal Factors	**External Pressure**
• Company values, policies, strategies, goals and targets • Stakeholder interests • Organizational success and risk factors • Organizational core competencies significant to sustainable development	• Stakeholder Concerns/indicators • Peer and Competitor focus/Benchmarking • Relevant laws, regulations, international and voluntary agreements • with strategic significance to company and its stakeholders • Response to international sustainability benchmarks i.e. climate change, global warming, etc.

Accountants' role in supporting an organizational strategy by understanding the issues of value chain will be very valuable in identifying material aspects and its impact in a company. Concept of materiality in accounting term is like water to fish but hard to realize. How a sanitary ware company measure use of water by its customers? Its' beyond its practical boundaries and issues beyond boundaries can have huge financial implications for companies. Creating value now and into future would require a documented strategy i.e. mapping and documented processes but also ethical commitment.

4.1.11 Disclosures of Management (DMA)

DMA starts at relatively higher level and asks broad open ended questions like why it is material to Organization, what its impacts are and what actions, policy, procedures, methods and approach are required. It informs stakeholders' issues of strategic nature that needs to be reported in a complete and consistent manner but don't let themselves to indicators. This would lead to behavior change in organization.

The DMA asks value to the KPIs and data information in providing context and tells the story/context about what companies are doing. To identify the material aspects, investors' needs to be assured that company have systems in place to review its risks to deal response preparedness and opportunity maximization. DMA helps initiate dialogue between companies and communities and prevent future conflicts. Reporting is not the end game but it is a transparency enabler and carrier of due diligence.

4.2 Factors/Drivers of Change for Sustainability Performance

The issue of sustainability performance differs by geography, culture, production process and other characteristics. The indicators analyzed for this study are Energy Intensity, Water Intensity, Emission, Waste, and Recycling. The complex matrix of sustainability poses a huge challenge for organizations in measurement. However, organizations have to measure its performance and the evolving set of sustainability indicators must be measured because of regulatory environment, resources are becoming contaminated and scarce and corporations themselves seeing

need for doing it for value and ethical reasons due to the cultural change that is taking place. Information, Integration, and Innovation drive the transition to a sustainable global economy and agents of change? The two main challenges of 21st century are financial stability and sustainability and they both are absolutely critical to address the financial and natural wreck coming generations would be facing. Sustainable capitalism is a new approach; a new tool kit to address such problems. When sustainability is put together with financial issues, it leads to integrated approach which is trying to establish a methodology which will be globally accepted and to try to address both the issues of financial stability and sustainability and to address at the same time.

Integrating disclosure suggests that a company needs to peel off the blocked visibility and look both forward and backward taking a holistic account. Capitalism has lifted more people out of poverty but in its current form looks wounded and a new form of capitalism is needed. The current financial reporting system is being called quarterly capitalism which needs to be replaced with sustainable capitalism and a long-term approach. The overwhelming predominance of short-termism in market compounded by a system ill suited to integrate and account for externalities simply removes many of the broader systemic risks from funding and investment equation. Sustainability is a quiet revolution which is happening in the hearts and minds of people and it is far too important to get financial stability and sustainability together. The urgency should be clear to policymakers, business leaders, experts in sustainability, investors and all stakeholders need to be galvanized.

World Business Council of Sustainable development (WBCSD) sees the world in a systemic crisis. There is lack of holistic approach in terms of sustainability. Because of global economic crisis governments are caught up in short-term recovery efforts. The only other powerful force is business and the choices are very simple. Either it sticks to the short-termism (quarterly financial outlooks) or breaking out and think hard for the long-term solutions. UN Global Compacts (UNGC) laid down visionary principles that corporations are following along with Global Reporting Initiative (GRI) framework. Capitalism needs a fundamental reboot, traditionally capitalism think of financial capital only but business must not forget that it also uses natural capital, resources on which it depends and the social capital. If businesses

integrate sustainability into their core business strategy it has to also integrate reporting both financial and non-financial aspects. This model which integrates all three (ESE) derived at true cost and value management context, based on materiality and rule based disclosures.

There is significant link between sustainability performance and economic performance. Current valuation methodology is so lean that it takes no account of externalities. Sustainability is more about the collaboration rather than the conflicts of interests. Collaboration does not mean a passive agreement but effectively challenging the conventional wisdom and harnessing the individual power. Sustainability is disenchanting at bottom of pyramid so it becomes impenetrate-able to vast majority of people. The impact of tragedy of commons, if not measured would lead to detrimental outcomes. Diversity and complexity of issue and clarity of message would achieve common future. The issue of materiality thus pushes through for more ways to measure. Leadership can be skeptical to allow them to ask questions they need to be discovered but discovery then allows them to question the answers that can lead to breakthrough in the economic, social and environmental sphere. Sustainability reporting is all about transparency which is critical not only for a well-functioning market economy but for sustainable development. More companies are now using sustainability not only as compliance but business strategy and business development. Governments can actively and constructively engage in this agenda in constructing regulations that help companies move in right direction.

In 2008, Denmark government decided to make sustainability reporting mandatory for around 1100 largest companies and financial institutions in Denmark. This was a piece of smart legislation and a timely approach that would help stakeholders to know about the choices companies make? Though reporting was not made mandatory for all, sustainability was perceived as mandatory practice. The impact and the overall trend suggest that around 90 percent of companies have chosen to report under sustainability policies, 50 percent of them for the first time. The quality of reporting has been improving considerably from year to year. The regulation can easily be accounted to a situation of different companies and the flexibility which is the main reason that companies infract being quiet critical initially but reacted positively subsequently. Thus it is important role for the governments to create right frameworks and incentives.

Experts believe that reporting may not be mandatory but sustainability should be. 18000 large companies in Europe are reporting while in emerging economy like India 9000 companies from have committed to reporting. “Corporate transparency is not achieved simply by disclosing information. The information disclosed must also be meaningful.”

4.2.1 Key Measurement Indicators

Energy, Water, Emission, Waste are key factors of organizations sustainable life. Water and energy must be seen as key strategic resources, with food security as the final goal for sustainable development for any nation. The challenges of fast depleting resources and increasing dependence on fossil fuels aggravating environmental challenges already being faced by islands countries requires inter-cultural, inter-sectorial, and international collaboration as imperatives for climate protection and energy security. There is need for international dialogue and cooperation and focus on increasing inequality between nations and the need for bridging the gap between those who care about nature and those responsible for policy making.

The challenges of energy and climate change, particularly the various national and collaborative projects that have been initiated in across sectors. However, there is stress on the nations heavily dependent on fossil fuels, in reducing their GHG emission. The international challenges of water, food, and energy which have been underestimated and undermined till now requires direct financial instruments and solutions driving investments in human capital, large scale technologies, and public private partnership. Technology and innovation needs to be complimentary to indigenous knowledge and local wisdom.

The sample for this study is comprised of the 80 corporations (figure 4.3) and classified under broad classification by Global Industry Classification Standard (GICS) structure. The corporations were evaluated on criteria covering the five factors/indicators of Environmental sphere; Energy, Water, Emission, Waste and Recycling measurement data.

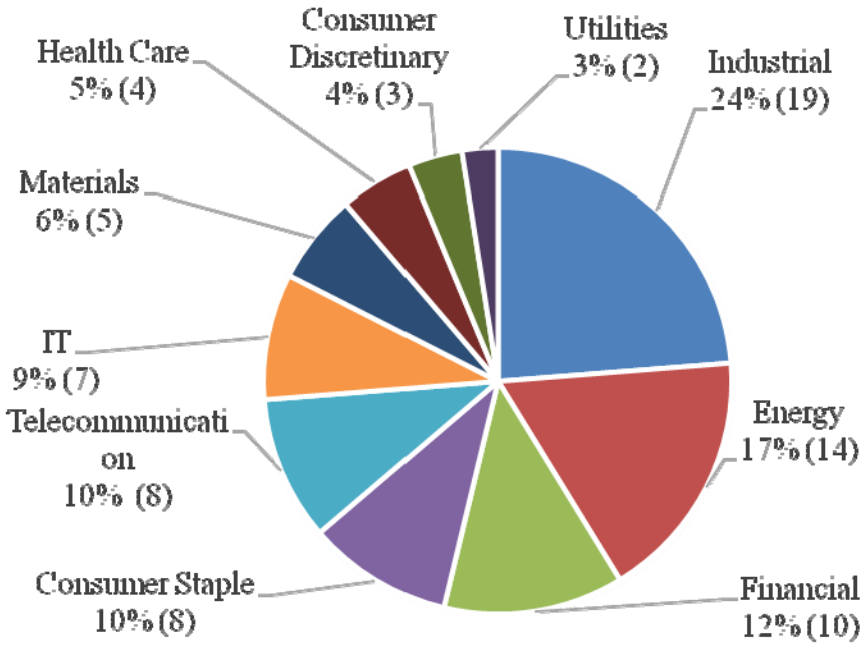


Figure 4.3 Industry (GICS) Classification (n=80)

4.2.2 Data Analysis

The data for this study were compiled from 80 multinational companies' annual sustainability report. The range of data was for 7 years (2006-2012) because almost all companies revealed data for last five years or less. This may be attributed to sustainability performance being new concept and lack of mandatory and regulatory framework. The analyses also found that there is huge variation in measurement practice and it lacks standard units from company to company.

The researcher recalculated available data to be converted into standard units for comparison purposes and to reveal trends. The data were sought for five environmental indicators namely, Energy, Water, Emission, waste and Recycling. Data availability for three years were considered as full data while less than three years data were considered as partial data. The analysis reveals that (figure 4.4) out of 400 grids, only 201 or 50 percent grids had full set of data, 53 or 14 percent grids had partial data while a substantial 146 or 36 percent grid had no data. It was found that companies interpret their data differently as against prescribed or in absence of a standard norm so the inter-company data is either missing or not interpretable.

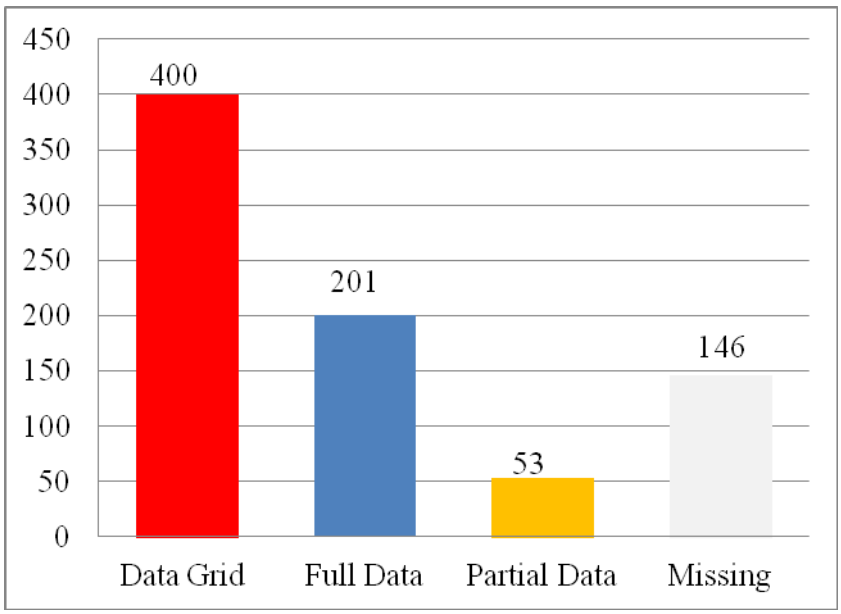


Figure 4.4 Data Frequency

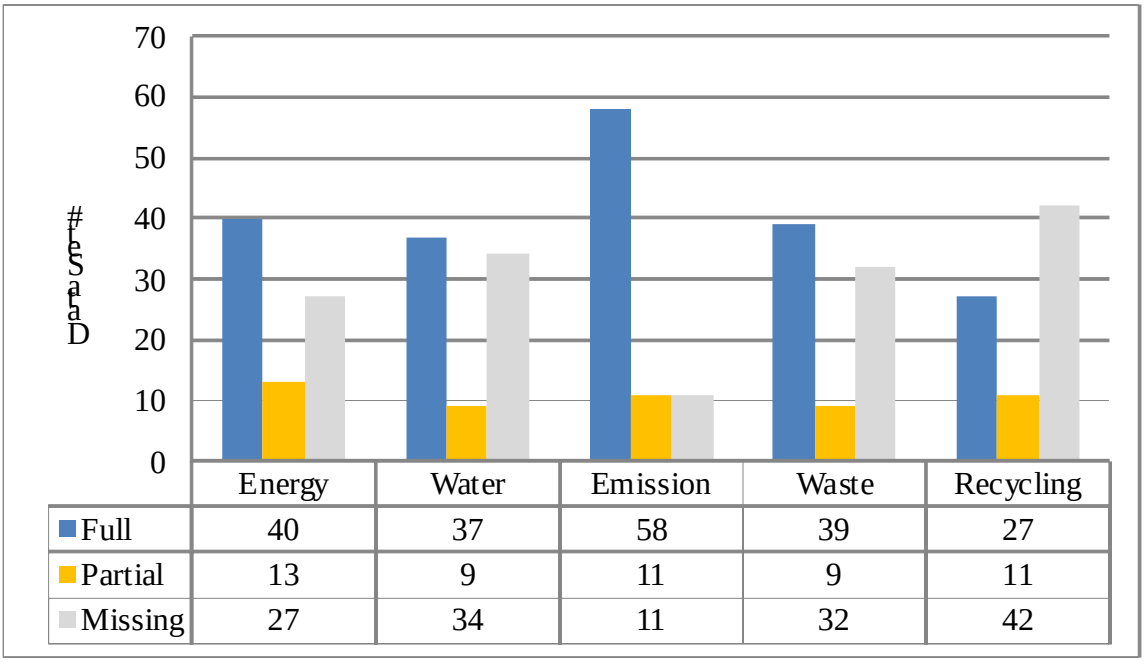


Figure 4.5 Indicator Wise Data Reporting (n=80)

The above figure 4.5 reveals that even the biggest corporations are not yet to the mark for full compliance. It is important to note that companies have a different level of impact and face a different level of risk for each Environmental indicator,

depending on the industry and location of operations. High-risk exposure or high impact for a particular indicator signifies greater relevance or materiality than low-risk exposure or low impact. For example, the level of risk exposure to emission within the supply chain will depend on a company's sector, the state of the regulatory infrastructure where its products are produced and the size of its operations.

Indicator wise analysis reveals that 72 percent corporations reported Emission data that was the best performing result followed by 50 percent Energy data, 49 percent Waste data, 47 percent Water data, and the lowest 34 percent corporations reporting Recycling data. On average 13 percent corporations reported partial data for all five indicators while over a third corporations, failed to report data on average for all five indicators. The Emission disclosure of 83 percent (full and partial data) followed by Energy disclosure 63 percent (full and partial data) suggests that Emission and Energy disclosure is a mainstream practice among large corporations.

Table 4.5 below provides an overview of the 80 corporations overall performance as well as specific environmental indicator disclosure. Additional information in the shaded squares provides a gap analysis indicating whether or not each company has a provided data on specific environmental indicator. A dark shaded square indicates that the item has been disclosed (i.e. the company has provided data for at least three years) while the light shade squares indicate partial data gaps (i.e. less than three years data disclosed). The blank squares indicate that no measurable data were disclosed (i.e. not considered material or relevant).Also indicated is the company origin and its classification on GICS structure and whether the company is a signatory to the UN Global Compact and whether it produces a CSR/Sustainability Report using GRI guidelines.

It is revealing to see that disclosure and reporting landscape is scattered with gaps and inadequate disclosure and reporting. This may be indicative of insufficient measurement and/or corporations' resistance in disclosing non-compliant and detrimental data.

Table 4.5 Analysis - Disclosure and Measurement (n=80)

Environmental Indicators #										
1 Energy	2 Water	3 Emission		4 Waste	5 Recycling					
Full data 201 (50%)		Partial data 53 (14%)			Missing data 146 (36%)					
Company	Country	Sector/ GICS Code		Framework	Env. Indicator #					
					1	2	3	4	5	
Adidas	Germany	Sports	25	14001						
Air France-KLM	Netherlands, France	Airline	20	GRI, UNGC						
Amgen Inc.	US	Pharma	35	GRI						
Anglo American plc	UK	Mining	15	UNGC, 14001						
Arcelor Mittal	Luxembourg	Mining, Steel	15	GRI, UNGC, 14001						
Asiana Airlines	Korea	Airline	20	GRI, I4001						
Bacardi Limited	Bermuda	Alcoholic Bev	30	GRI, UNGC,14001						
BAE	UK	Aerospace	20							
Barclays PLC	UK	Banking	40	GRI						
Bayer AG	Germany	Health care	35	GRI, UNGC						
Bell Canada	Canada	Telecom	50	GRI, UNGC						
Boeing Corporate	US	Aviation	20	CDP						
Bombardier	Canada	Aircraft, Train	20	GRI, UNGC						
BP plc	UK	Oil & Gas	10	GRI						
CapitaLand Limited	Singapore	Real Estate	20	GRI						
Cathay Pacific	Hong Kong	Airline	20							
City Dev. Limited	Singapore	Property Dev.	20	GRI, UNGC, LEED						
Cemex S.A.B	Mexico	Cement	20	GRI						
Coca Cola Europe	Belgium	Beverages	30	GRI, UNGC						
Cognizant Tech.	US	IT	45	GRI						
Constellation Energy	US	Energy	10	GRI						
Credit Suisse AG	Switzerland	Banking	40	UNGC						
CSL Limited	Australia	Biotech	35							
Danisco A/S	Denmark	Food	30	GRI, DJSI						
EDC	Canada	Export Dev.	40	GRI						
Emirates	UAE	Airline	20							
Exxon Mobil	US	Petroleum	10	GRI						
Fluor Corporation	US	Engineering	20	GRI, UNGC						
France Telecom	France	Telecom	50	GRI,26000						
Freeport McMoran	US	Mining	15	GRI						
General Electric	US	Technology	20	GRI						
Henkel	Germany	Home Care	30	GRI, UNGC, DJSI						
Hess Corporation	US	Oil & Gas	10	GRI						
HSBC Holdings plc	UK	Banking	40	ISAE3000						
Hydro Quebec	Canada	Elec. Gen.	10	GRI, 14001						
IATA	Canada	Aviation	20							
IBM Corporation	US	IT	45							
IDB	US	Banking	40							

Table 4.5 (Continued)

Company	Country	Sector/ GICS Code		Framework	Environmental Indicators #				
					1 Energy	2 Water	3 Emission	4 Waste	5 Recycling
					Full data 201 (50%)		Partial data 53 (14%)		Missing data 146 (36%)
					Env. Indicator #				
					1	2	3	4	5
Kellogg's	US	Food	30	GRI					
Kinross Gold Corp.	Canada	Mining	15	GRI, UNGC, 14001					
L'Oreal S.A.	France	Cosmetics	30	UNGC					
Lafarge	France	Cement	15	GRI,DJSI					
LAN S.A.	Chile	Airline	20	GRI					
Land Securities	UK	Real Estate	20						
Marathon Oil Corp.	US	Oil	10	GRI, UNGC					
Marks & Spencer	UK	Apparel, Food	25						
Merck	US	Pharma.	35	GRI, UNGC					
Microsoft Corp.	US	Software	45	GRI, UNGC					
Motorola Mobility	US	Telecom	50						
NCB	Saudi Arabia	Banking	45	GRI					
Nexen Inc.	Canada	Oil & Gas	10	GRI					
Noble Energy Inc.	US	Oil & Gas	10	GRI					
OXY Oil Corp.	US	Oil & Gas	10	HES Mgmt. System					
Philips Electronics	Netherlands	Health, Light.	45	GRI, 14001					
Provident Financial	UK	Finance	40	GRI					
Qantas Airways Ltd.	Australia	Airline	20	GRI,DJSI					
Repsol YPF Group	Mexico	Energy	10	DJSI					
RWE Energy	Germany	Nucl. Energy	10	GRI, UNGC					
SAB Miller plc	UK	Alcoholic Bev	30	GRI, UNGC					
SAP	Germany	IT	45	GRI					
SCG	Thailand	Chem., Cem.	20	GRI, UNGC, DJSI					
Shell PLC	Netherlands	Energy	10	GRI, UNGC, CDP					
Singapore Airlines	Singapore	Airline	20	14001					
Singtel Limited	Singapore	Telecom	50	GRI					
Southwest Airlines	US	Airline	20	GRI					
State Street Corp.	US	Finance	40	GRI, DJSI					
Sulzer	Switzerland	Engineering	20	GRI					
Symantec Corp.	US	System Solu.	45	GRI, UNGC					
TE Connectivity Ltd	Switzerland	Eng. & Tech.	20	GRI, CDP					
Teck Resources Ltd.	Canada	Mining	15	GRI					
Telstra	Australia	Telecom	50						
Telus Corporation	Canada	Telecom	50	GRI, UNGC					
The Co-operative	UK	Co-operative	30						
Toyota Europe	Belgium	Automotive	25						
Tullow Oil plc	UK	Oil & Gas	10	GRI					
Verizone	US	Telecom	50	GHGP, DJSI, EPA					
Virgin Australia	Australia	Airline	20	GRI, CDP					
Virgin Atlantic	UK	Airline	20						
Vodafone	UK	Telecom	50	GRI					
Westpac Corp.	Australia	Banking	40	GRI					

4.2.3 Best Performing Corporations

Based on the above analyses it can be further assessed that which corporations performed best among some of the top ranking corporations. Table 4.6 and 4.7 reveals the best corporations who met the criteria for this study. Out of 80 corporations, 17 (21%) corporations can be judged best sustainability performing corporations who met all five indicators. These corporations provided their performance data on energy, water, emission, waste and recycling on consistent basis i.e. three years or more data over a period of seven years. This criteria made the performance data comparable and to see their performance level. In contrast it is revealing to see that 6 (35%) of these best 17 performing corporations did not use any reporting framework i.e. GRI, the most used reporting framework or some of the other frameworks. This suggests that while international frameworks are an effective tool, they are yet not mandatory and companies use them as soft regulation and as guidance. The analysis also reveals corporations have specific policies and reports on sustainability issues. Overall 14 (17%) corporations did not use any reporting framework out of 80.

This analysis also reveals a second group of corporations who were close to be the best performing but missed out the list by a small margin. They however need mention. Table 4.7 lists the corporations who provided measured data for at least four indicators and in some cases partial data on fifth indicator for at least three years on a seven year range. A total of 13 (16%) corporations were found to be in this group while only 1(8%) did not use any reporting framework in this group.

A total of 30 corporations (tier 1 & 2) were found to be best performing corporations in line with the criteria set for this study. This is by no means vindication of their overall sustainability performance which is to be judged by an extensive analytical framework covering broad spectrum of indicators as opposed to limited but vital indicators used for this study. Most corporations are aware of the issues, but yet to developed corresponding policies and practices. The analysis presented here indicates that best practice has still not permeated through to all of the largest corporations in the world. If the first group alone is taken as current best practice, then only about a fifth of the corporations studied can be said to employ best practice in this area. Taking both groups into account it is about 37% corporations are judged to be employing best practices judged on vital environmental indicators.

Table 4.6 Best Performing Corporations Tier 1

Company	Country	Sector	Framework
Air France-KLM	Netherlands, France	Airline	GRI/UNGC
Boeing	US	Aviation	CDP
CDL	Singapore	Property Dev.	GRI, UNGC, LEED
CSL Plasma	Australia	Biotech	
Henkel	Germany	Home Care	GRI, UNGC, DJSI
Hess Corp	US	Oil & Gas	GRI
HSBC	UK	Banking	ISAE3000
IBM	US	IT	
IDB	US	Banking	
Kellogg	US	Food	GRI
Motorola	US	Telecom	
Singapore Airlines	Singapore	Airline	ISO14001
Sulzer	Switzerland	Engineering	GRI
TE Connectivity	Switzerland	Eng. & Tech.	GRI, CDP
TECK	Canada	Mining	GRI
The Cooperative	UK	Cooperative	
Toyota Europe	Belgium	Automotive	

Although the sample was not analyzed for sector analysis, the corporations overall rankings indicate that there is no evident segregation of sectors across the groups. No particular sector demonstrates outright leadership in the overall rankings, although Industrial and Energy sector has the highest number of corporations in the group. This sector's performance could be attributed to sector specific social and environmental challenges from stakeholder concerns.

Table 4.7 Best Performing Corporations Tier 2

Company	Country	Sector	Framework
Bayer	Germany	Health care	GRI, UNGC
Bombardier	Canada	Aircraft, Train	GRI, UNGC
EDC	Canada	Export Dev.	GRI
Merck	US	Pharma.	GRI
Provident Financial	UK	Finance	GRI
Qantas	Australia	Airline	GRI,DJSI
Repsol	Mexico	Energy	DJSI
RWE Technology	Germany	Energy	GRI, UNGC
SAB Miller	UK	Alcoholic Bev	GRI, UNGC
SCG	Thailand	Chem., Cement	GRI, UNGC, DJSI
Singtel	Singapore	Telecom	GRI
Virgin Atlantic	UK	Airline	
Vodafone	UK	Telecom	GRI

4.2.4 Case Study

The case study of six best performing corporations (from this study) from Asia, Europe and America compares the Economic and Social performance of corporations with Environmental performance. It is generally seen that companies' sustainability performance improves with the economic performance. The performance data of these companies suggest that a good fiscal management combined with effective environmental and social initiatives makes a potent strategy framework for successful companies. These companies are proving the persistent myth wrong that the ultimate purpose of a business is to maximize profit for its investors. Companies now transcend this purpose with sustainability strategies and proving that money can be made doing good things for society.

4.2.4.1 SCG Thailand

SCG has been conducting business according to the guidelines of sustainable development since its establishment in 1913. The Group has diversified into five core businesses which include SCG Chemicals, SCG Paper, SCG Cement, SCG Building Materials, and SCG Distribution. SCG's aspires to serve as a sustainable business leader in ASEAN and following its excellent performance in sustainable development, SCG has been honored with the Sector Leader in the Building Materials & Fixtures for a second consecutive year (2011-2012) from Dow Jones Sustainability Indexes (DJSI), a global sustainable best practice ranking index for global leading companies by evaluating aspects of economic, social, and environment. SCG is the only company in ASEAN to be honored a Sector Leader rank and also is classified in the Gold Class, the highest class, for the fifth consecutive year since 2008.

SCG is focused on being a Green Business through the adoption of Green Process and Green Products strategies. In addition, SCG is committed to a "Zero Waste to Landfill" goal for all industrial wastes generated from its operations by 2012. Based on the understanding of the impacts of greenhouse gas emissions and climate change, SCG has set a target for the reduction of greenhouse gas emissions by 10 percent compared to 2007 levels by 2020. SCG is also the first organization in Thailand that has established a Green Procurement policy since 2004. This policy creates a base for conducting an environmentally friendly business throughout the value chain. In 2009, there were 254 product models that were registered under the Green Procurement list and there were 6 new partners that became a part of the program. In 2009, there were 87 products that were certified by the SCG eco value label.

Table 4.8 SCG Sustainability Performance Data 2008-2012

Performance Data	2008	2009	2010	2011	2012
Economic Performance					
Net Sales (Billion Baht)	293.2	238.7	301.3	368.6	407.6
Net Profit (Billion Baht)	16.8	24.3	37.4	27.3	23.6
Investment and Expenditure (Million Baht) (Community Development, Social Infrastructure)	450	331	480	712	563
Environmental Expenditure (Million Baht)	832	845	1146	1741	1964
Environmental Performance					
Energy Consumption (Petajoules)	135.50	135.48	140.68	167.68	174.58
Water Consumption (Million Cubic Meters)	78.20	91.89	95.50	104.55	110.80
Water Recycle (%)	10.54	10.78	9.99	9.90	9.92
Emission Co2 (Million Tons)	17.87	18.92	19.66	20.73	21.96
Waste_Hazardous (Thousand Tons)	14.32	13.44	17.02	12.21	14.65
Waste_Non-Hazardous (Thousand Tons)	749.38	653.60	1,176.12	1,305.30	1,215.07
Social Performance					
Number of Employees	27,305	28,515	30,820	34,725	38,883
Total Incident Rate (cases / 200,000 man hours)	0.41	0.42	0.46	0.41	0.36
Employee	0.44	0.60	0.83	0.37	0.23
Contractors					
Number of Fatalities	3	0	0	1	0
Employee	3	4	13	8	11
Contractors					

Source: SCG, 2012.

The performance data above reveals that over the past five years SCG environmental performance has been increasing at steady levels as in relation to its economic performance. The social performance data is not comprehensive and reveals little about major social initiatives that SCG is engaged in with local communities. The company's performance declined in 2009 that can be attributed to global financial crisis. This also reflected in social and environmental performance. Subsequently the performance has been on the rise that barring slight decline in profit in year in later years but surge in sales figures. The social expenditure were adjusted from its peak in 2011 but the environmental expenditure continue to receive boost over the years. This correlation between financial and non-financial performance establish a positive

outlook and suggests that companies can engage in social and environment activities without adverse impact on their financial bottom-line. Instead a sound triple bottom-line is being achieved.

The figures (4.6 and 4.7) shows a positive correlation between SCG's increasing sales and the environmental expenditure while profit remained constant in spite of various challenges company faced in global economic outlook. Since 2009, company's revenue has been on the rise and that trend also reflected in its environmental and social expenditure.

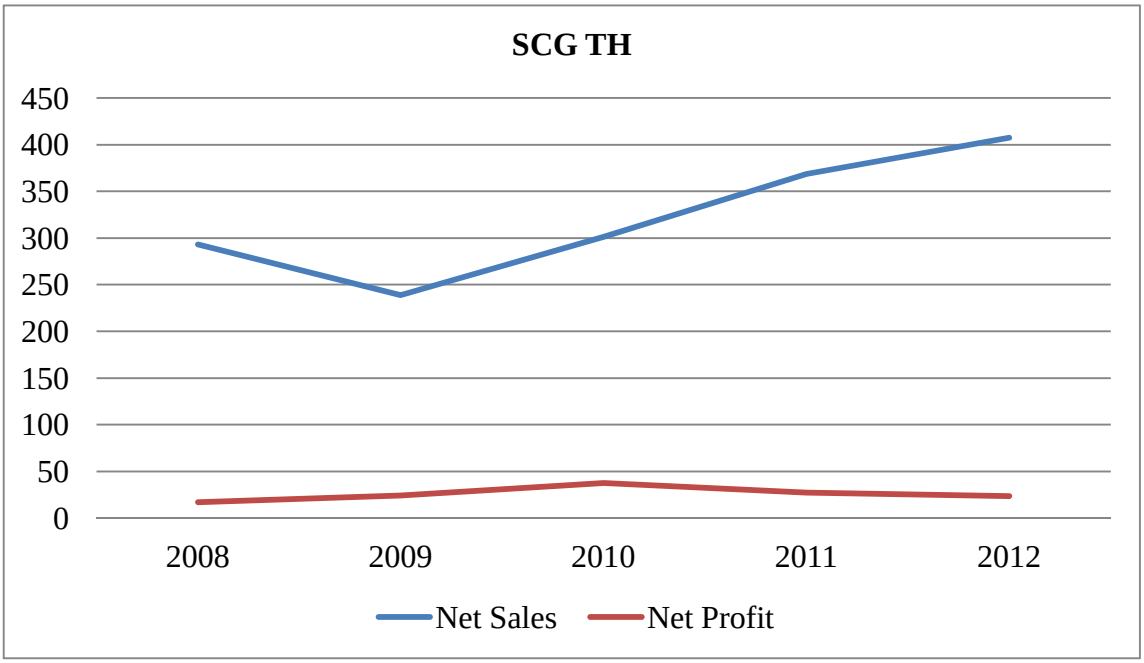


Figure 4.6 SCG Net Sales and Profit

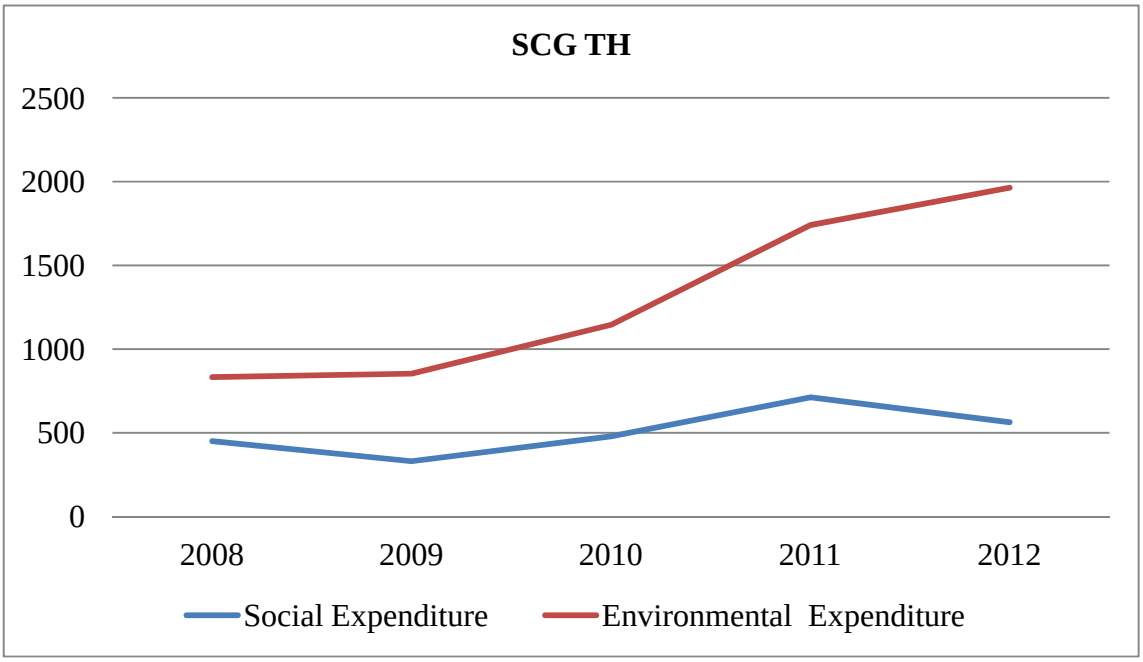


Figure 4.7 SCG Social and Environmental Expenditure

4.2.4.2 Air France-KLM Europe

The Air France-KLM group comprises a single holding company and two airlines, Air France and KLM, each of which retains its own brand and identity. Its three main businesses are passenger transport, cargo transport and aviation maintenance services, for its own fleet and those of other airlines. Airline is an extremely competitive business and very few airlines are able to generate consistent growth and profit. In year 2012, Air France-KLM registered consolidated revenues amounted to €25.63 billion, up by 5.2% on the previous financial year. The environmental efficiency of the group in the same period reflected better performance and efficiency compared to previous year.

Table 4.9 Environmental Efficiency 2011-2012

Energy	Water	Emission Co2	Waste	Recycling
-4%	-8.4%	-4.6%	-3.2%	58%
				Hazardous Industrial Waste

Major environmental impact of Air France-KLM is caused by the emissions of its flight operations. The Group achieved 15% reduction of relative CO2 emission since 2000. The Group's strategy to mitigate climate change, known as the "Climate Action Plan" works to minimizes its environmental impact in the field of noise, energy, water and waste. The Group goes beyond regulatory requirements by:

1) Mitigating noise and emissions from its operations by renewing fleet and implementing the most efficient procedures.

2) Optimizing its performance and collaborating with partners in the entire supply chain.

3) Investing in sustainable aviation fuel and contributing to aviation and renewable energy research.

4) Involving internal and external stakeholders in environmental action plans in line with eco-design principles and supports environmental protection programmes led by NGOs.

5) Providing its passengers with transparent information on their related CO2 emissions and the possibility to offset travel related CO2 emissions and corporate customers with the opportunity to fly part of their business travel on sustainable biofuel.

6) Supporting efforts to reach a new worldwide climate agreement and mobilises the aviation sector for a fair contribution to collective targets.

Air France-KLM is assessed annually by the major international non-financial rating agencies. The Group has been ranked leader in the aviation sector by the two DJSI indexes, DJSI World and DJSI Europe, 9th year running. In 2013 the Group was also named Supersector Leader in the "Transport" category. This recognition places the Group in the world's 19 most sustainable companies listed on the DJSI.

4.2.4.3 Henkel Germany

Henkel claims to have focus on developing various measurement methods to identify where it can have the greatest impact on sustainability in the value chain to meet the goal of optimizing its "Value" and "Footprint" dimensions. The results are then used to develop suitable improvement measures. Only by considering

the entire life cycle it is ensured that the action taken will improve the overall sustainability profile of products.

To further develop and simplify the analysis methods – including those for determining the carbon and water footprint of products, Henkel work with external partners. For example, it took an active part in the Sustainability Consortium and the Measurement Group of the Consumer Goods Forum. To make it possible to measure sustainability, Henkel developed various instruments that come together with the Wuppertal Institute Collaborating Center on Sustainable Consumption and Production (CSCP) in Germany and have used it in a variety of different ways to conduct dialogue with retail partners, nongovernmental organizations, research institutions and other stakeholders.

Henkel's evaluation system is a matrix that can be used to assess changes in the "Value" and "Footprint" dimensions. What are known as hot spots can be identified for every product category on the basis of scientific measurement methods, e.g. life cycle analyses and empirical data. These are the fields with the greatest relevance for sustainability–this applies to both the "Value" and the "Footprint" dimension. The matrix can also be used to compare the sustainability profile of two products or processes, thus allowing changes to be quantified. Henkel's researchers use these findings for innovation and continuous product improvements.

The performance data comparison above shows Company's financial performance improved while in the same period environmental efficiency also improved. All environmental indicators show declining consumption and output in spite of increased production and revenue. This reverse equation is the testament of company's improved sustainable performance. The company sustainability targets (announced in 2008) for 2012 were met by the end of 2010. The reduction it achieved in Energy consumption (21%), water usage (26 %), and the amount of waste generated (24 %) was significant. Over the same period, the number of occupational accidents fell by 29 percent.

Henkel emphasizes the importance of sustainable development throughout its history with systematically research in sustainable products and getting a major breakthrough in detergent technology in 1958. Henkel is also a founding member of the 'World Business Council for Sustainable Development' and in 2003, it joined

‘United Nations Global Compact’. Henkel is also listed in the ‘Dow Jones Sustainability Index’ since it was established in 1999.

Table 4.10 Henkal Germany Sustainability Performance Data 2011-2012

Performance Data	**2011**	**2012**
Economic Performance		
Net Sales (Million Euros)	15,605	16,510
Operating Profit (Million Euros)	2,029	2,335
Production Sites	180	171
Production Output (Thousand Metric Tons)	7,550	7,587
Environmental Performance		
Energy Consumption (Thousand Megawatt Hours)	2,220	2,197
Water Consumption (Thousand Cubic Meters)	7,921	7,734
Emission Co2 (Thousand Metric Tons)	652	651
Waste (Thousand Metric Tons)	145	138
Social Performance		
Number of Employees	47,265	46,610
Donations (Million Euros)	6	7
Number of Projects Supported	2,343	2,339

With its sustainability strategy for 2030, Henkel plans to achieve more with less and triple its efficiency in the next 20 years. In view of the increasing demand on limited natural resources, the company will continue to improve and focus on involving employees even more deeply in sustainability activities, intensifying its collaboration with partners across the value chain, and further improving its evaluation, steering and communication tools. As a short-term goal until 2015, Henkel aims to achieve a 15 percent reduction per production unit in the focal areas energy, water and waste. At the same time, the company plans to reach a 10 percent increase in net external sales per production unit. Henkel also intends to reduce its incident rate by 20 percent.

4.2.4.4 Kellogg's US

Kellogg's is one of the world's leading producers of cereal and snack food products with 2012 sales of more than $14 billion. It operates through four regions: North America, Europe, Latin America and Asia Pacific. Kellogg's have set companywide goals to help drive reductions in its direct environmental impacts, with specific reduction goals for each manufacturing plant that align with these overall targets.

Table 4.11 Kellogg Sustainability Performance Data 2008-2012

Performance Data	**2008**	**2008**	**2010**	**2011**	**2012**
Economic Performance					
Net Sales (Billion Dollars)					14.2
Operating Profit (Million Dollars)					961
Production Sites					56
Environmental Performance					
Energy Consumption (Million	12.63	12.88	12.74	12.62	12.31
Gigajoules)	13.23	12.76	12.43	12.00	11.88
Water Consumption (Million Cubic	1.14	1.10	1.10	1.06	1.04
Meters)	33.33	24.78	19.32	21.85	21.06
Emission Co2 (Million Metric Tons)					
Waste (Thousand Metric Tons)					
Social Performance					
Number of Employees					31,000
Community Investment (Million					52.3
Dollars)					

Kellogg's energy reduction targets are to reduce energy use and greenhouse gas (GHG) emissions (per metric tonne of food produced) by 15 to 20 percent in 2015 from 2005 level. As seen in the charts below, our performance on these two metrics was essentially flat in 2012. However, energy use and GHG emissions per metric tonne of food produced have each decreased by 7.4 percent since baseline year of 2005, putting the targets slightly behind in its efforts to 2015 energy and GHG goals. The company has been using lean manufacturing techniques and

analyzing its energy usage carefully to determine where additional reductions and efficiencies can be realized cost-effectively.

Using the World Resources Institute's 2025 Water Availability Index and WBCSD's Global Water Tool, Kellogg identified a number of its sites located in water-stressed areas. The goal of reducing water use by 15 to 20 percent from 2005 to 2015, water use per metric tonne of food produced increased slightly in 2012. But it is down 13 percent since the baseline year of 2005, so the company is on track to meet our 2015 goal. Some of the Kellogg sites are located in extreme water stressed area.

At Kellogg, waste to landfill metric track waste minimization most closely and only about 3 percent of overall waste ends up in a landfill. The remaining 97 percent is recycled or sold to livestock operators to be used for animal feed. Kellogg has set a vision to send zero waste to landfill by 2015.

Sustainable packaging is one of the key efforts by Kellogg to ensure that while it is effective in protecting foods while minimizing the materials used. In order to both keep product costs down and reduce packaging's environmental footprint, company uses sustainable forest products. In 2012, 84 percent of its food cartons globally were made from recycled fiber content. Of the forest-product-based packaging material that is not recycled, more than 99 percent is made from certified sustainably grown virgin fiber. This material is certified either through the Forest Stewardship Council (FSC) or the Sustainable Forestry Initiative (SFI) to boost the recycled content of packaging and increase its recyclability.

4.2.4.5 TECK Canada

Teck is Canada's largest diversified resource (mining) company. It is one of the world's largest producers of zinc and zinc alloys, and a fully integrated non-ferrous resource company with mines, refineries and sales offices located throughout the world. Other products marketed include copper, lead, silver, indium, cadmium, germanium and gold.

Teck was recognized as one of the Global 100 Most Sustainable Corporations for 2013 at the World Economic Forum in Davos, Switzerland. Teck was the top ranked Canadian company on the Global 100 list. Teck has also been named to the Dow Jones Sustainability World Index (DJSI) for the last three years, which ranks Teck's sustainability practices in the top 10 per cent of companies in the resource sector worldwide.

Table 4.12 Teck Canada Sustainability Performance Data 2008-2012

Performance Data	2007	2008	2009	2010	2011
Economic Performance					
(CDN $ Million)		6,655	7,674	9,339	
Net Sales		1,327	3,419	2,872	
Net Profit		15	16	20	
Community Investment					
Environmental Expenditure					
Environmental Performance					
Energy Consumption (TJ)	36,973	43,728	38,065	43,654	44,444
Water Consumption (m3)	118,954,680	125,097,160	119,317,578	131,330,872	
Water Recycle (%)					
Emission Co2 (kt)	2,568	3,039	2,602	2,970	2,955
Waste_Hazardous (Thousand Tons)					
Waste_Non-Hazardous (Thousand Tons)					

In 2011, Teck launched a comprehensive sustainability strategy, setting long-term sustainability goals that stretch through to 2030 to help it achieve our vision for sustainability in six focus areas: People, Community, Water, Biodiversity, Energy, and Materials Stewardship.

Improving energy efficiency and supporting the increased use of non-carbon-emitting energy sources are key company's vision of making a positive contribution to efficient use of energy. In 2012, we implemented initiatives across our operations aimed at improving our energy efficiency. Teck has setup a long-term goal of implementing projects that reduce energy consumption by a cumulative 6000 terajoules at its operations.

Teck conducts life cycle assessments of its products to ensure that their value is maximized and environmental effects can be minimized by taking leadership in recycling. Its trail operations processed approximately 11,700 tons of lead from battery products in 2012, equivalent to approximately 1.6 million car batteries. Its operations also continued to build on its electronic waste (e-waste) recycling program, which recovers useful metals from end-of-life electronics. Trail Operations also processed 65,000 tons of electronic waste since 2006 and in 2012, processed 12,000

tons, reducing waste and keeping metals and plastics out of landfills. Also, each year Teck mining operations recycle and reuse about 200 million cubic meters of water.

The efforts of the company shows that while its operations and financial performance have been on the rise, the company also been achieving better sustainability performance over the years.

4.2.4.6 PTT PCL Thailand

PTT Public Company Limited, (PTT PCL), is a Thai state-owned integrated energy and petrochemical company, conducting its business as national energy company and being listed on the Thai Stock market. PTT is one of the largest corporations in the country and also the only company from Thailand that listed in the Fortune Global 500 companies, which ranks 128 among top 500 companies in the world, an improvement of 27 ranks since 2010 according to Fortune magazine in 2011. It owns extensive submarine gas pipelines in the Gulf of Thailand, a network of LPG terminals throughout the Kingdom, and is involved in electricity generation, petrochemical products, oil and gas exploration and production, and gasoline retailing businesses. PTT has three dimensional strategies to address economic, environmental and social goals that have been gaining momentum in recent years.

PTT Group CSR Policy and Framework has been implemented since 2008 with policy and framework that were adopted ensure constant updates in the sustainability domain to keep up with the international practice. The review reflects changing business landscapes and provides an opportunity for PTT to prepare for and respond to challenges while marching towards success in a strategic manner. This update covers standards, practices and assessment criteria relating to the energy industry such as the ones implemented by Global Reporting Initiative (GRI), Oil and Gas Sector Supplement, Dow Jones Sustainability Indexes (DJSI), and World Business Council for Sustainable Development (WBCSD): Its Vision 2050 is the final outcome in the PTT Group Sustainability Management Framework.

In response to address challenges of energy demands and climate change issues PTT has set a strategic vision to become a Technologically Advanced and Green National Oil Company (TAGNOC). It is a strategy to drive business through advancement in innovation and technology that are designed to minimize environmental impacts. TAGNOC represents PTT’s vision to strategically transform

from a resource-based company into a knowledge-based company. To this end, PTT has crafted the Technology Roadmap to drive innovation and the Green Roadmap to guide the entire organization covering products, processes as well as public awareness. PTT has rolled out clear targets and developed work plan to reduce greenhouse gas emission and environmental impacts. Sustainability Management Framework is an integral part of our organization management.

PTT's has introduced Economic, Environmental and Social Initiatives to transform its sustainability objectives. An initiative project called "Group Integrated Supply Chain Management and Optimization" (GISMO) with refineries under PTT Group. The object is to increase competitiveness and create synergy within the petroleum supply chain where information of facility use is shared among one another to reduce capital investment and to generate higher benefit for the PTT Group. The GISMO initiative boasts five major projects. The Petrochemicals and Refining Integrated Supply Chain Management (PRISM) project is a result of collaboration between the PTT refinery group and its petrochemical business that enhance Value optimization. This reflects the creation of value and synergy for the PTT Group which has been going on since 2007. During its first year, as much as 72 million US$ added value was created. It was expected that added value of no less than 120 million US$ would be generated from six work stream under PRISM in 2012.

PTT complies with the Quality, Safety, Health and Environment Policy to control, prevent and reduce risks, and to preserve ecology and biodiversity. For land transportation, PTT prefers oil to be transported through transmission pipelines of both Thai Petroleum Pipeline and Fuel Pipeline Transmission to reduce environmental impact from transport truck's engine combustion and minimize accident. This policy has resulted in reducing more than 3,000 trucks to pass through Bangkok and its vicinity per month. For maritime shipments, PTT has created the PTT Group Ship Vetting Standard to vet vessels not qualified for shipping transport or which are at higher risk of being involved in accident. In addition, PTT has formed an alliance with refineries and major oil suppliers to help relieve marine accidents. PTT has also become a member of the Oil Spill Response Limited (OSRL) to receive assistance and to lessen marine environmental impact in an event of oil spills. This is one of the guidelines under PTT supply chain management strategy regarding social and environmental risk.

The analysis of above case studies clearly demonstrates that increased financial performance generally result in increased environmental spending. Financial performance is attached to corporate image that is seen as intangible asset. Environmental performance is now regarded as equally important in terms of how it affects corporate image. The corporations who are leaders in their field and have global outreach are increasingly spending their revenue in response to societies' expectation about their environmental responsibility.

The environmental indicator analysis below of 80 corporations below however, reveals the gap that exists in terms of environmental data compliance and disclosure, contrary to the recognition that benefits of sustainability reporting goes beyond firm's financial risk and provide opportunities to perform across TBL dimensions.

4.2.5 Energy Intensity

While the international debate around climate change and energy continues with no definitive outcome year after year, greenhouse gas emissions continue to accumulate in the atmosphere changing the global climate. It is expected that carbon emissions in Asia alone will increase more than 75% by 2030, the highest percentage of increase across all worlds regions. Over 50% of world energy demand will come from China and India by 2035. Global primary energy demand is projected to increase by just over 50% between now and 2030. In the face of climate change, private sector has role in accelerating progress in carbon reduction and bending the trend curve by providing innovative solutions. The barriers to the deployment of energy-efficient technologies and practices needs to be overcome by corporations with the climate change strategies and plans.

The climate change and energy dilemma is the cornerstone of corporate business strategy. The energy demand will double to the projected 2030 capacity. In contrast the CO2 emissions will need to be cut to half to avoid dramatic climate change by 2050. Over 50% of CO2 emission abatement can be from end use efficiency and the rest will come from renewable (21%), biofuels (3%) nuclear (9%) and CCS (15%) according to World Energy Outlook 2010. The unprecedented urbanization in Asia presents a major challenge. Asia today has 17 of 25 most dense

cities. Beijing will have 60 million inhabitants by 2035. The chart below shows world's dependence on fossil fuel up to 80 percent that is unsustainable for the projected economic growth. Corporate would need to adopt sustainable energy initiatives and technologies and contribute to solve the looming energy crisis.

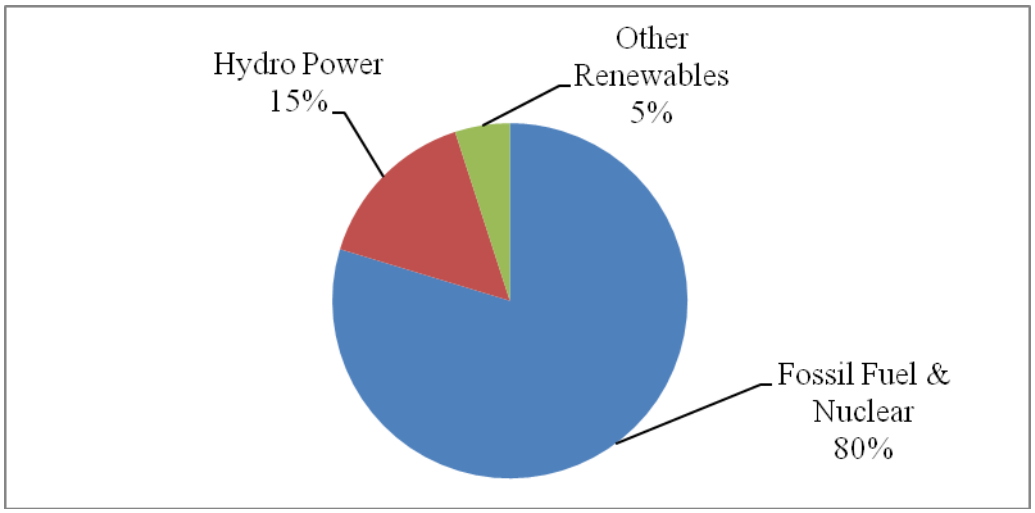


Figure 4.8 Global Energy Share (%)
Source: REN 21, 2012.

The analysis of energy consumption data on a sample of 80 companies revealed that a maximum of 34 or just over 42 percent companies disclosed sufficient data. The data were revealed in different units like kWh, Btu and variations in joule (J) units that were converted into Million GJ for arriving at standard data. The energy consumption variation of from 5 million GJ to over 36 million GJ that can be attributed to high energy intensive industries like mining, steel making etc. Maximum number of companies used upto 5 Million GJ in a given year which is consistent from year 2009 to 2012. The consistent trend shows that some energy efficiency is achieved across the board because the production capacity of large corporations increases with growing demand. Very few companies reported share of renewable source of energy if any they acquired and if any surplus energy was put back into the grid. For example, IBM procured 9.38 percent on average between year 2006 and 2010 of their energy from renewable source.

Energy consumption has a direct effect on operational cost and can increase exposure to energy supply and prices. The environmental footprint of an organization is shaped greatly by its choice of energy source. The consumption of non-renewable fuels ids the main contributor to GHGs. It is very important for company to distinguish between fossil fuel energy and renewable or clean energy. Fossil fuel energy is the main contributor to GHGs and increasing consumption by industry is unsustainable. Very few companies reported their energy data in year 2006-2008. In subsequent years the number of companies reporting energy data has increased considerably but still below 50 percent. More companies should measure and disclose their energy data. GRI-G4 requirements demands companies to disclose following energy aspects, energy consumption within the organization (joules or multiples), energy consumption outside of the organization, energy intensity, reduction of energy consumption, and Reduction in energy requirements of products and services.

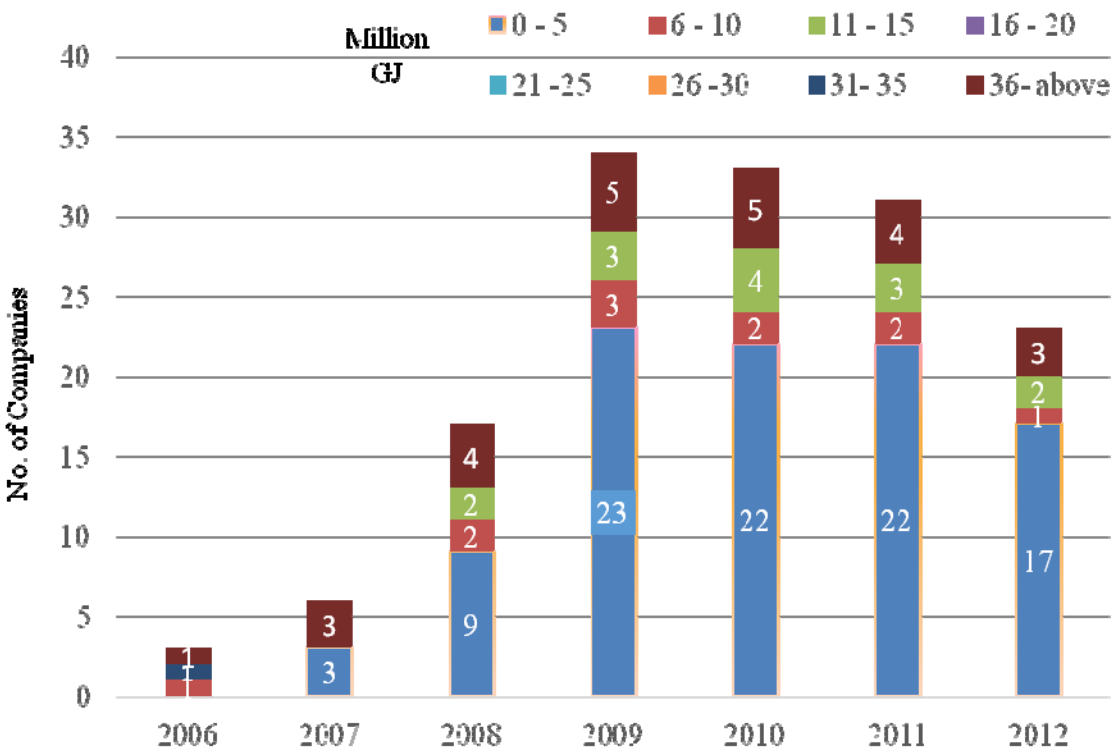
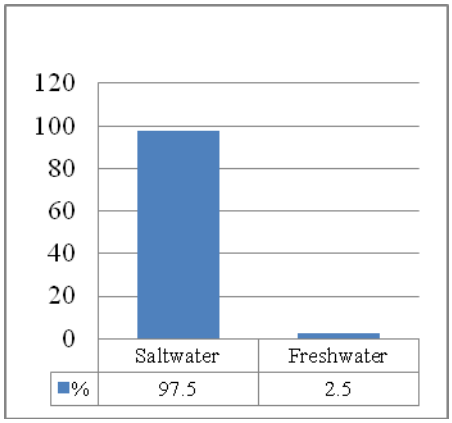


Figure 4.9 Energy Consumption (Million GJ) n 3-34

4.2.6 Water Intensity

Water challenges are both global and local. It plays a critical role in maintaining all natural systems which underpin life. Proper water management strategies need to be implemented to reduce severe water risk. The extraction of water by business from surface watercourses, groundwater, and collection of rainwater for consumption reduces the amount of water available to others and therefore reduces the benefits society derives from water. Business is a key player to lead both local and global initiatives towards responsible water stewardship. Developing a comprehensive water strategy is paramount and what tools and standards are emerging to assist companies in managing their water risk. The key question is how companies can measure their water footprint and engage stakeholders in a collective approach to water management. Freshwater withdrawals are predicted to increase by 50% by 2025 in developing countries, and 18% in developed countries (UN-WWAP, 2006).



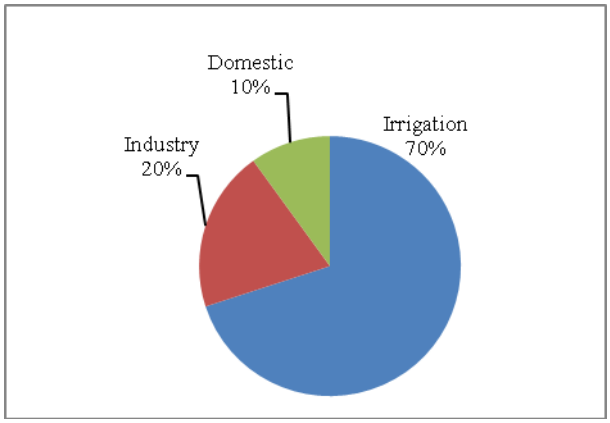


Figure 4.10 Global Water Resource **Figure 4.11** Freshwater Usage (%)

Saltwater 97.5% Freshwater 2.5% (70% covered in ice and snow, 30% groundwater, 0.3% freshwater lakes and rivers. By 2030, 47 % of world population will be living in areas of high water stress. About 70% of water is used for irrigation, about 20% for industry and about 10% for domestic use.

Source: WWAP, 2013.

The analysis of data reported from 80 companies' show that up to 58 companies reported their water consumption data**.** The peak was over 70 percent companies reporting in year 2009. The data available in different units were converted into Million m3 for standard comparison. The chart below reveals that most companies consumed up to 5 million m3 water and maximum number of companies reported data onwards year 2008. Reporting the total volume of water withdrawn by source contributes to an understanding of the overall scale of potential impacts and risks associated with the organization's water use. Mining and food production industry for example are heavy water intensive industries and often operate in water stressed areas. The systematic effort to monitor and improve the efficient use of water in the organization is directly linked to water consumption cost. Clean freshwater is becoming increasingly scarce and can impact production process such as food and beverage production. Organizations water consumption pattern can also influence its relationship with stakeholders. GRI-G4 guidelines recommend organization to measure their water use by, total water withdrawal by source, water sources significantly affected by withdrawal of water, percentage and total volume of water recycled and reused, and operations site adjacent to high value biodiversity area. Withdrawal from a water system can affect the environment by lowering or polluting the water table. The rate of water reuse and recycling is a measure of efficiency and demonstrate the success of organization in reducing total water withdrawal and discharge.

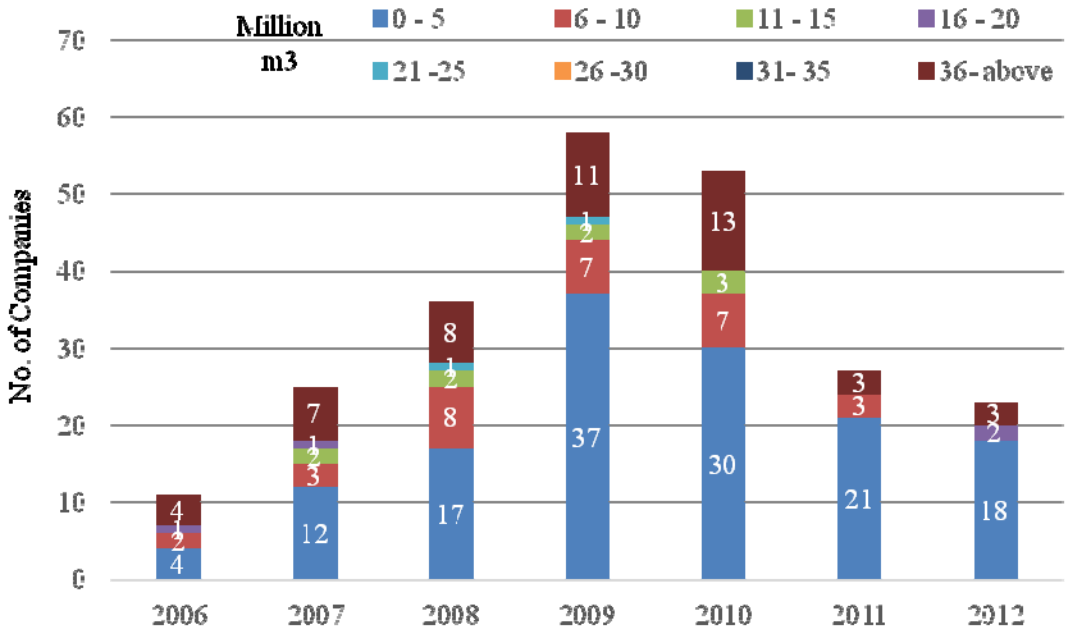


Figure 4.12 Water Consumption (Million Cubic Meters) m3, n 11-58

One of the world's largest apparel companies Levi Strauss & Co. to reduce its direct impact, an early sustainability strategy started in 1991. Terms of Engagement established labor, health and safety and environmental standards for direct contractors. Water quality standards were established for laundry suppliers in 1994. Restricted substance list of prohibited or restricted chemicals were introduced in 2003 and in 2006 Levi's eco jeans were produced with 100% organic cotton. A 2006 in-house research showed that the greatest impact occurred in cotton production and consumer use of Levi's products in correlation to climate change and water use impact. That means the greatest opportunity for reducing environmental impact exists at the beginning and end of the product life cycle. Based on this research the company needed to focus on sustainable design = < less water usage for cotton production and manufacturing, leading to consumer care. Levi's is now leading the development of new standard for sustainability in apparel industry. The current strategy contains life cycle based approach to identify and address the areas of biggest impact i.e. brand partnership with water.org and blend design with sustainability.

4.2.7 Emission Intensity

Worldwide emissions of GHGs have increased steeply since 1945 and GHG emissions will increase by another 50 percent by 2025 compared to current levels, with emissions in developing countries growing the fastest. (www.WRI.org) Avoiding dangerous climate change will require slowing this global trend in the short term, and reversing it over the next one to two decades. Because of their large contributions, key policy targets are electricity and heat, transport, buildings, industry, land-use change and forestry, and agriculture. Future growth is likely to be especially high in the electricity and transport sectors, suggesting that these are particularly important sectors for promoting policy change, investment, and technology innovation.

A relatively small number of countries produce a large majority of global GHG emissions. Most also rank among the most populous countries and have the largest economies. The major emitters include almost an equal number of developed and developing countries. Coal, the highest carbon fuel, plays a dominant role in global electric power generation, and its future growth is expected to be significant. Avoiding dangerous climate change will require reduced coal use or geologic sequestration of coal-related emissions. Similarly, major emitting countries will need to reduce their dependence on oil, particularly in the transport sector where it has near monopoly status. Natural gas, because of its lower carbon content and increasing cross-border trade, has the potential to offer climate benefits if it can offset coal and oil consumption in key sectors.

Table 4.13 Global GHG Emission

Global GHG Emission (%)					
Gas		**Source**		**Country/Region (CO2)**	
CO2 (fossil fuel)	57	Energy Supply	26	China	23
CO2	17	Industry	19	USA	19
(Deforestation,biomass		Forestry	17	EU	13
depletion etc.)		Agriculture	14	India	6
Methane	14	Transport	13	Russia	6
Nitrous Oxide	8	Buildings	8	Japan	4
CO2 (Other)	3	Waste &Wastewater	3	Canada	2
F-gases	1			Other	28
EPA (IPCC 2007) 2004 data		EPA (IPCC 2007) 2004 data		EPA data	

The GRI-G4 guidelines for emission aspects include indicators on GHG gases as well as ozone-depleting substances NOx, SOx and other significant air emission. However the data analysis for this study only looked at CO2 emission data of company. Upton 66 companies out of 80 reported on Co2 data which is just over 82 percent disclosure. Emission can't be decoupled with energy intensity and linked more so with fossil fuel burnout. Since carbon is now being treated as utility that is priced, it is very important for companies to measure and report carbon emission. GRI GHG emission is based on reporting requirements of WRI and WBCSD accounting and reporting standards. The unit of measurement for analyses in this study was Million metric tons and maximum number of companies reported emission up to 5 million metric tons which is direct GHG emission (scope 1) according to GRI-G4 guideline. There are also other emission type like energy indirect GHG emission (scope 2) and other indirect GHG emission (scope 3). Few companies also reported emission intensity ratio between scope 1, 2, & 3, and other significant air emission. 'Scope 1' emission comes from physical sources (units or processes) that release GHG into the atmosphere. Fugitive emission results from intentional or unintentional release, such as equipment leaks. 'Scope 2' GHG emission results from the generation of purchased electricity are much greater than their direct GHG emission. 'Scope 3' emissions are a consequence of the activities of the organization, but occur from sources not owned or controlled by organization. Intensity ratio defines an organization's GHG emission in the context of an organization specific metric. Intensity is calculated by dividing the absolute emissions (the numerator) by an organization-specific metric (the denominator). Few companies also provided reduction of emission data on emission. Different standards and methodologies exist so organizations are expected to report standards, methodologies and assumptions used to calculate emissions. The emission calculation for any organization seems to be an incredibly complex process and may lack accuracy because of methodology selection and lack of expertise available at company level. For example companies are also expected to measure Ozone-depleting Substances (ODS) that can demand scientific vigor. In addition, significant air particle calculation can also be complex though incredibly important. Air pollution has adverse effects on climate ecosystems, air quality, habitats, agriculture, and human and animal health.

The chart below reveals that global CO2 emission increased steeply since 1940 postindustrial age. The current level of GHG emission is unsustainable according to expert studies led by UN and needs to be contained in urgency. The answer lies in non fossil fuel energy source that can feed the ever growing population and industry demand. Corporate efficiency in non-fossil energy use and reduced emission is of immense importance in achieving this goal. It is encouraging to see from the chart below that the biggest corporations are applying innovation in energy use and measuring their emission level to manage it to sustainable level.

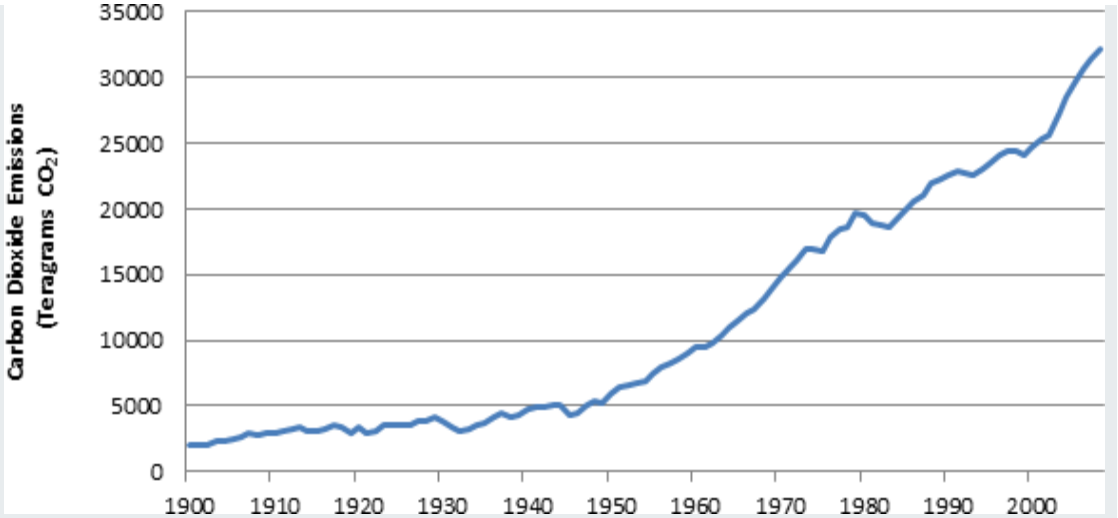


Figure 4.13 Global Carbon Dioxide (CO_2) Emissions from Fossil-Fuels 1900-2008
Source: Environmental Protection Agency, 2013.

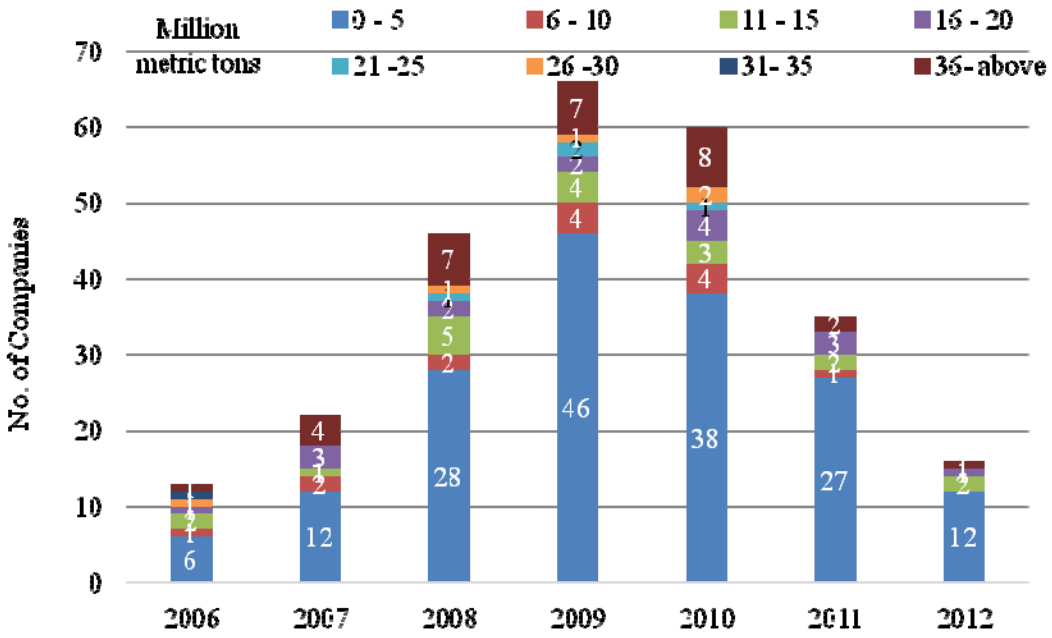


Figure 4.14 Emission (Million Metric Tons) Co2e, n 13-66

4.2.8 Waste and Effluents

Volume of material wasted (not converted to desirable product) that may have the potential to be returned for remanufacturing. The material being used should be distinguished into renewable or mined from geological resources. The more we know about the types of waste we generate, the more we can target specific waste for recycling and reduction. Through refined data analysis, we have classified over 40 categories of waste. The large-scale conversion of waste into energy would, in theory, help resolve two of the world's biggest problems. Apart from rising energy costs associated with dirty fuels, there is far too much waste on the planet. The World Bank expects the 1.3 billion tons of waste to be produced in major cities to double by 2025. Industries produce a huge amount of waste. Out of 80 companies analyzed for waste data, maximum of 36 or 45 percent companies reported waste data. The waste data was measure in metric tons for this study. Large number of companies generated waste in the range of 1000 to 2000 metric tons.

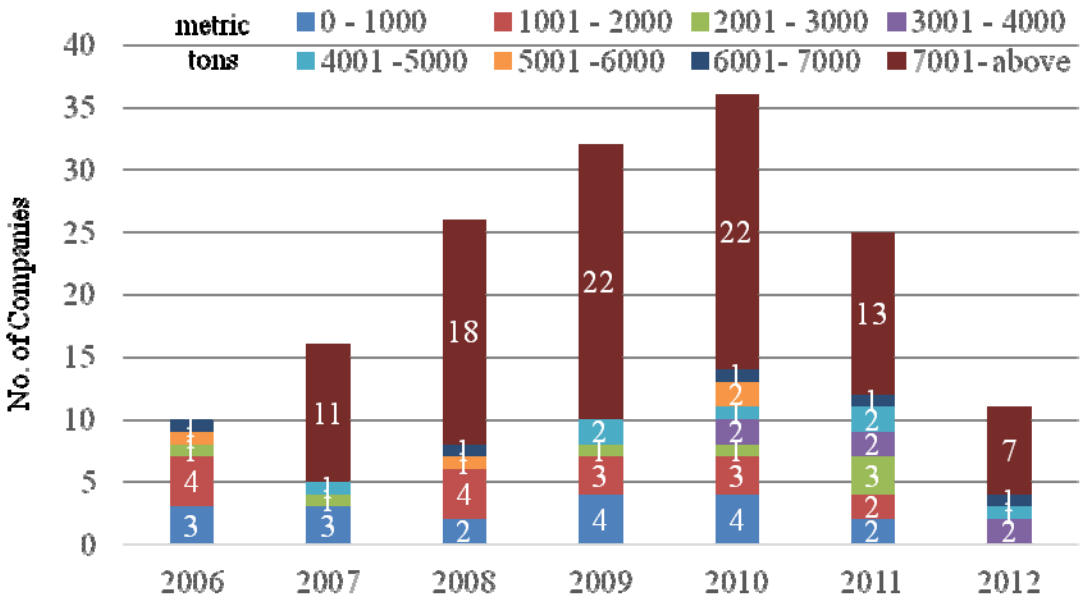


Figure 4.15 Waste (Metric Ton) n 10-36

The amount and quality of water discharge by the organization is directly linked to ecological impact and operational cost. By progressively improving the quality of discharge water or reducing volume, the organization has the potential to reduce its impact on surrounding environment. Unmanaged discharge of effluents with high chemical or nutrient load can have a significant impact on receiving waters. This in turn, can affect the quality of the water supply and relationship with stakeholders. The above data indicates that organizations have made towards waste reduction efforts and improvements in process efficiency, the reduction of waste contributes directly to lower cost of materials, processing and disposal cost. Hazardous waste management is the key area of concern for many stakeholders. Improper transport of dangerous waste, particularly to countries that lack the infrastructure and national regulation to handle such waste can pose harm to both human health and the environment. For Corporations, these situations create liability associated with non-compliance of regulations and loss of goodwill.

4.2.9 Recycling

There are no clear guidelines for corporations to measure recycling data in GRI-G4 and it is associated with waste reduction. However, recycling is extremely important measure organizations can take to reduce its overall environmental impact. Since there was no clear data available, the researcher analyzed available data and calculated percentage of recycling in terms of total nonhazardous waste. A maximum of 13 companies out of 80 or just over 16 percent could reveal recycling percentage. Though it is a small sample, it is very encouraging to see that percentage of recycling is very high to nearly 90 percent in some instance and generally over 50 percent. Corporate have realized the cost benefits and environmental necessity of recycling and thus applying innovative technology in achieving such high degree of recycling. Recycling creates different kind of environmental impact and residual effects compared to land filling as most waste minimization strategies emphasize prioritizing options for reuse, recycling, and recovery over disposal options.

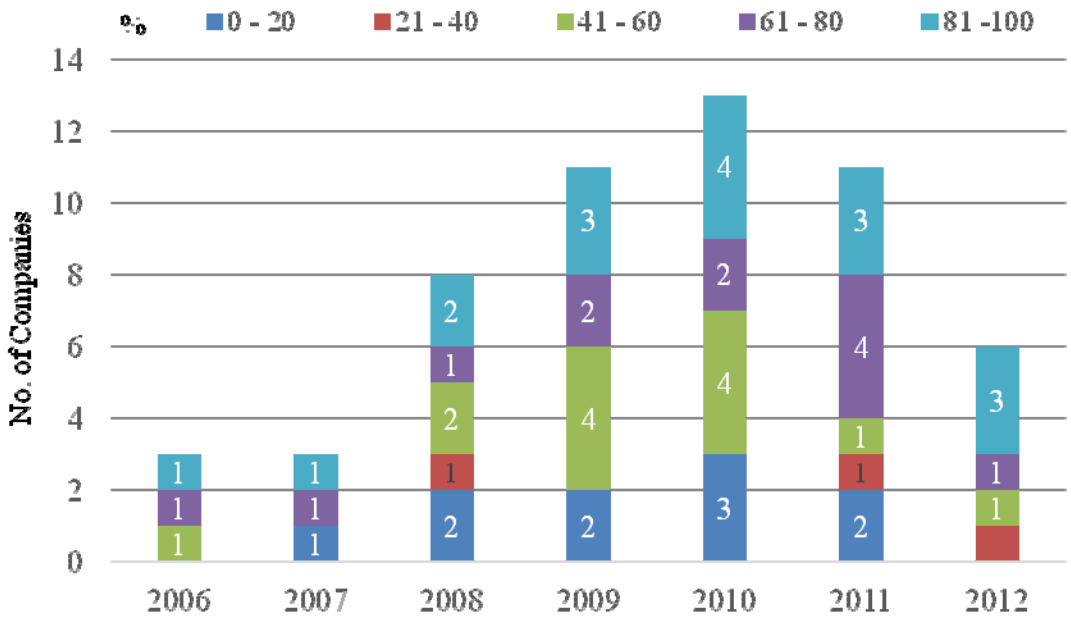


Figure 4.16 Recycling (%) n 3-13.

4.3 Evaluation of Sustainability Performance

The concept “the triple bottom line” (TBL) argues that companies should be preparing three different bottom lines. One is the traditional measure of corporate profit, profit and loss account. The second is the company's “people account”, a measure in some shape or form of how socially responsible an organization has been throughout its operations. The third is company's “planet” account, a measure of how environmentally responsible it has been. The TBL thus consists of three Ps: profit, people and planet. It aims to measure the financial, social and environmental performance of the corporation over a period of time. Only a company that produces a TBL is taking account of the full cost involved in doing business. In some senses the TBL is a particular manifestation of the balanced scorecard. Behind it lies the same fundamental principle: what you measure is what you get, because what you measure is what you are likely to pay attention to. Only when companies measure their social and environmental impact will we have socially and environmentally responsible organizations. The challenge lies with adding up three separate accounts. It is difficult to measure the planet and people accounts in the same terms as profits, i.e. in terms of cash. For example, the full cost of deforestation is probably immeasurable in monetary terms, as is the cost of oil spillage or the human rights violation which has long term implications.

This study proposes an integrated approach for the evolution of triple bottom line as a natural progression, eventually leading to Value driven sustainability performance. The table below projects a framework of sustainability performance consisting broad range of emerging approaches. The framework comprises three phases or dimensions of sustainability performance environment an organization have to traverse through. The environment phase of value driven sustainability performance seems elusive but being seen as new norm. The evaluation of environmental indicator in this study shows that only about a half of largest corporations comply with the voluntary framework. The practice has to trickle down to the entire canvass of business practice around the world.

Framework like GRI provide comprehensive index that identifies suitable data required for different variables. The Genuine Progress Indicator (GPI), for example,

consists of 25 variables that encompass economic, social and environmental factors. Those variables are converted into monetary units and summed into a single, dollar-denominated measure. There is a large body of literature on integrated assessment and researchers argue that the three categories need to be integrated in order to see the complete picture of the consequences to assess policy options.

As seen in the framework, (Table 4.12) the application of the TBL by businesses are motivated by the principles of economic, environmental and social sustainability, but differ with regard to the way they measure the three categories of outcomes. Environmental sustainability is the culmination of sustainability journey that is extended beyond financial and social outlook of company to ecological and ethical responsibility. The finite resources of earth and forces like climate change has changed the course of market outlook of corporation to be ethical and value driven. Environment sustainability however cannot be achieved in isolation as it is the new paradigm that is leading the financial and social goals of the organization to the culmination of functional, social and ethical values into a holistic and balanced approach. Corporations who adopt this approach are able to maintain higher reputation in society and their actions are regarded less detrimental to the cause of planet.

Table 4.14 A Framework for Sustainability Performance Measurement

Dimension →	**Economic** **Product-centric Sustainability Performance**	**Social** **Consumer-oriented Sustainability Performance**	**Environmental** **Value-driven Sustainability Performance**
Objectives	Maximum resource utilization	Resource utilization near normal	Resource optimization
Enabling forces	Industrialization	Innovation	Climate Change
Market Outlook	Product development for global market	Differentiation through consumer awareness	Spirited customers with values
Sustainability Guidelines	Product specification	Indirect Impacts	Material Aspects & Externalities

Table 4.14 (Continued)

Dimension →	Economic Product-centric Sustainability Performance	Social Consumer-oriented Sustainability Performance	Environmental Value-driven Sustainability Performance
Consumer & Stakeholder Interaction	Mass transaction	Individual relationship	Multi level collaboration
Disclosures	Financial reporting	Financial & Sustainability reporting	Compliance & Integrated reporting
Value Propositions	Functional	Functional and Social	Functional, Social and Ethical

4.3.1 Sustainable Value Creation

Corporations now believe that Strategies that take sustainability criteria into account have the capacity to create long-term value. Sustainable Value integrates all three dimensions through integration of environmental and social dimensions into financial analysis and investment decision making. Such actions have also raise investors' interest and have led to the appearance of sustainability-related indexes linked to financial markets. The market economy focus in not only on production but profit, part of this profit should go for public good. Bold leadership makes big impact. Financial Markets value resources that come without a value tag but sustainable value assesses and manages environmental and social resources similar to economic resources. Best practices should be shared with businesses, governments, multinationals and civil society. Private-Private Partnership (PPP) can foster innovation, recognition and visibility. For businesses, only abiding law is not important but they need to act ethical, that comes at a price and provides benefits to society and company. Investors must invest in company with social responsibility, good products and ethics of public good. There are many different paths to CSR i.e. financial contributions; skills based contributions, pro-bono goods and services, advocacy and governance, increasing awareness, cause marketing, shared value etc. Bold corporate leadership leads to big

impact. To find the CSR giant organizations should start in an authentic place by understanding that there is no one right path by insuring that leadership is informed and supportive. Leadership must be guide by the core principle/value that CSR is an opportunity, not an obligation.

Policy innovation is the key to a green economy and change in energy policy? Those involved in the industry (the government, consumers, business) often seem to be shifting responsibility between each other. Consumers need to get behind policies in order to influence business, but policies are needed in the first place in order to get behind them. Government needs to support business, which should not be expected to compromise profits at will; but ultimately the fate of policy-pushing government lies in the hands of consumers. A strike of balance will involve compromise. Even though technology develops at great speed, social change moves at snail's pace. Whether the economy will turn green will depend in large part on whether people get to use new technologies and whether w these technologies are get to work in a practical context. The key to this is making innovations cheap. For ambitious carbon-reduction targets, technology exists, but the political and economic will does not. Countries are trailing in terms of collaboration between research and business. There is need to catch up, with several government initiatives. The energy cliff is not inevitable. There is unlimited amount of energy that can be harnessed form the renewable, the question is just whether it is achieved in time.

The need for economic growth coupled with inclusive development demands balance in regional perspective on sustainable development and its key challenges. It would lead this transition to a more resource-efficient economy, which would not only improve the environment, but also lead to spill-over effects in terms of job creation and enhanced institutional capacity. Africa with the lowest carbon emission as well as the lowest adaptive capacity is the most vulnerable continent especially to issues relating to agriculture, land, and biodiversity. The world needs a structure, which focused on inclusion and resilience building to address some of Africa's challenges. There is need to have a cross-purpose conversation between the concerns of developed and developing countries and the collective public action to fund true public goods and governance that focused on reducing inequality. Environmental and social objectives cannot be dealt through the invisible hand of markets and would

require more polycentric approaches including informal institutions. The market need to create incentives and disincentives that lead to a change in the behavior of both consumers and private companies to be able to transition towards a greener economy. The official development aid has outlived its usefulness in the context of Millennium Development Goals and the momentum should be build for the need to translating words into specific actions for addressing global challenges by channelizing resources towards renewal assets.

4.3.2 Sustainability Reporting Policy and Regulations

Governments and regulators have a direct interest in sustainability reporting – it can help markets function more efficiently, and drive progress towards sustainable development goals. An increasing amount of policy and regulation promotes sustainability reporting. Governments and market regulators play a multi-faceted role in promoting sustainability reporting. They do not just regulate private entities - they are also expected to lead by example regarding their own transparency on financial and non-financial performance. State-owned companies may be asked to report their sustainability performance, as in Sweden and China. Public agencies are increasingly reporting their sustainability performance, and are asking their suppliers to do the same through sustainable procurement practices and policies. Transparency on environmental, social, and governance factors also comes into play when governments act as investors or investment managers. Governments and market regulators can also promote a culture of transparency, stimulating public debate. They are positioned to invite business to support specific initiatives and activities, promote and support research, build practical capacity, enter into public-private partnerships, and promote and support multi-stakeholder initiatives.

The United Nations Conference on Sustainable Development at Rio+20 was an outstanding example of making sustainability reporting top of the agenda. Around the world an increasing number of governments and market regulators are adopting policies and regulation for sustainability reporting. Sustainability reporting is relevant for governments, as it helps them to understand what companies within their jurisdictions are doing with regard to their environmental and social impacts, assess companies' contribution to national sustainability efforts, creates transparency and

creates dialogue between companies and other stakeholders, including governments. It also makes it possible to hold companies accountable for the impacts of their activities Sustainability reporting is therefore a vital first step for managing change towards a sustainable global economy, promoting transparency and clear understanding of national sustainable development efforts.

4.3.3 Sustainability Reporting/Performance Measurement Framework/ Guidelines

A number of initiatives assist organizations with their sustainability strategy and reporting though the current sustainability reporting landscape for measuring and verifying is inconsistent. A sustainability report is an organizational report that gives information about economic, environmental, social and governance performance. An increasing number of companies and organizations want to make their operations sustainable. Establishing a sustainability reporting process helps them to set goals, measure performance, and manage change. A sustainability report is the key platform for communicating positive and negative sustainability impacts. To produce a regular sustainability report, organizations set up a reporting cycle–a program of data collection, communication, and responses. This means that their sustainability performance is monitored on an ongoing basis. Data can be provided regularly to senior decision makers to shape company strategy and policy, and improve performance. Sustainability reporting is therefore a vital step for managing change towards a sustainable global economy–one that combines long term profitability with social justice and environmental care.

There are a number of internationally accepted sustainability frameworks. Some have a comprehensive sustainable scope, or focus on a single issue such as greenhouse gas emission, climate change, or the impacts of business activity. Some global initiatives, most widely used are discussed here.

4.3.3.1 Carbon Disclosure Project (CDP)

CDP provides global reporting system that collects information from the world's largest organizations about their climate change risks, opportunities, strategies and performance and the way in which they consume and affect natural resources including water and forests. By leveraging market forces including

shareholders, customers and governments, CDP has incentivized thousands of companies and cities across the world's largest economies to measure and disclose their greenhouse gas emission, climate change risk and water strategies. With 4200 of world's largest companies reporting to CDP in 2012, CDP holds the world's largest database of self-reported climate change data (Carbon Discloser Project, 2013).

4.3.3.2 Global Reporting Initiative (GRI) G4

GRI's Sustainability Reporting Framework including its Reporting Guidelines offers the Principles and Disclosures organizations can use to report their economic, environmental, social and governance performance and impacts. It provides organizations with disclosure items and metrics that align with the most important international normative framework. It is designed for use by organizations of any size, sector, or location.G4 is GRI's fourth generation of Sustainability Reporting Guidelines, released in May 2013. G4 emphasis is on the need for organizations to focus the reporting process and final report on those topics that are material to their business and their key stakeholders. This 'materiality' focus intends to make reports more relevant, more credible and more user-friendly. This will, in turn, enable organizations to better inform markets and society on sustainability matters (Global Reporting Initiative, 2013).

Table 4.15 Categories and Aspects in GRI G4 Framework

Economic	Environmental	Social ***
• Economic Performance • Market Presence • Indirect Economic Impacts • Procurement Practices	• Materials • Energy • Water • Biodiversity • Emission • Effluent & Waste • Products and Services • Compliance • Transport • Overall • Supplier Environmental Assess • Environmental Grievance Mechanism *** **Society** • Local Communities • Anti Corruption • Public Policy • Anti-competitive Behaviour • Compliance • Supplier Assessment for Impacts on Society • Grievance Mechanism for Impacts on Society **Product Responsibility** • Customer Health and Safety • Product and Service Labeling • marketing Communications • Customer Privacy • Compliance	**Labour Practices and Decent Work** • Employment • Labour/Management Relations • Occupational Health & Safety • Training & Education • Diversity & Equal Opportunity • Equal Remuneration for Women and Men • Supplier Assessment for Labour Practices • Labour Practices Grievance Mechanism **Human Rights** • Investment • Non-discrimination • Freedom of Association and Collective bargaining • Child Labour • Forced or Compulsory Labour • Security Practices • Indigenous Rights • Assessment • Supplier Human Rights Assessment • Human Rights Grievance Mechanism ***

4.3.3.3 Greenhouse Gas Protocol (GHG Protocol) Corporate Standard

The GHG protocol is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emission. The GHG Protocol is result of a long partnership between the World resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), working with business, government, and environmental groups around the world to build a new generation of credible and effective programme for tracking climate change. (www.ghgprotocol.org)

4.3.3.4 PRI Reporting Framework

The United Nations supported Principles for Responsible Investment (PRI) initiative is an international network of investors working together to put the six Principles for Responsible Investment into practice. Its goal is to understand signatories to incorporate these issues into their investment decision making and ownership practices. The Principles offer guidelines of possible actions for incorporating ESG issues into investment practices across asset classes through are some mandatory indicators. (www.unpri.org)

4.3.3.5 OECD Guidelines for Multinational Enterprises

The OECD Guidelines provide recommendations for responsible business conduct in areas such as employment and industrial relations, human rights, environment, information disclosure, combating bribery, consumer interests, science and technology, competition, and taxation. 44 adhering governments-representing both OECD and non-OECD member countries from around the world encourage their enterprises to observe the Guidelines wherever they operate. (www.oecd.org/ daf/inv/mne/)

4.3.3.6 Dow Jones Sustainability Index (DJSI)

The Dow Jones Sustainability Indices are maintained collaboratively by S&P Dow Jones Indices and RobecoSAM. The indices measure the performance of the world's sustainability leaders. Companies are selected for the indices based on a comprehensive assessment of long-term economic, environmental and social criteria that account for general as well as industry-specific sustainability trends. Only firms that lead their industries based on this assessment are included in the indices. The indices are created and maintained according to a systematic methodology, allowing

investors to appropriately benchmark sustainability-driven funds and derivatives over the long term.

4.3.3.7 Environmental Tracking (ET) 3.0

Environmental Tracking is a ‘market mechanism” designed to apply economic pressure to global publicly listed companies to reduce their GHG emissions. The concept consists of two key aspects,

Firstly, a ranking system which encourages emission reduction, greater standards of disclosure, and, higher level of external verification of those emissions.

Secondly, the creation of an investment platform which translates the rankings into share price incentive mechanism that encourages companies to improve their positions within the rankings.

Because, the ET concept links company’s share price to its carbon emissions, this strategy places an incentive mechanism right at the centre of investment and business decision-making process. It would serve to act as a subtle form of environmental pricing which would damage a company’s share price if it pursued an environmentally detrimental course of action.

4.3.3.8 United Nations Global Compact (UNGC)

The UNGC is the largest policy initiative for businesses that are committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption. The ten principles are derived from United Nations Declarations and Conventions. UNGC signatories are required to issue a Communication on Progress (COP), a public disclosure to stakeholders on progress made in implementing the ten principles (United Nation Global Contact, 2013).

Table 4.16 UNGC Ten Principles

UNGC Ten Principles
The UN Global Compact's ten principles in the areas of human rights, labour, the environment and anti-corruption enjoy universal consensus and are derived from: • The Universal Declaration of Human Rights • The International Labour Organization's Declaration on Fundamental Principles and Rights at Work • The Rio Declaration on Environment and Development • The United Nations Convention Against Corruption The UN Global Compact asks companies to embrace, support and enact, within their sphere of influence, a set of core values in the areas of human rights, labour standards, the environment and anti-corruption: Human Rights • Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and • Principle 2: make sure that they are not complicit in human rights abuses. Labour • Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining; • Principle 4: the elimination of all forms of forced and compulsory labour; • Principle 5: the effective abolition of child labour; and • Principle 6: the elimination of discrimination in respect of employment and occupation. Environment • Principle 7: Businesses should support a precautionary approach to environmental challenges; • Principle 8: undertake initiatives to promote greater environmental responsibility; and • Principle 9: encourage the development and diffusion of environmentally friendly technologies. Anti-Corruption • Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

Source: United Nation Global Contact, 2013.

4.3.3.9 ISO 26000

The International Organization for Standardization (ISO) has developed voluntary guidelines on social responsibility for use by all types of organizations. This standard (ISO 26000) has been developed through an international consensus of many stakeholder groups. ISO 26000 includes valuable discussion on the general characteristics of social responsibility (e.g. transparency, respect for human rights, respect for stakeholder interests). ISO 26000 also discusses the background of social responsibility, including mention of related international instruments. Another important aspect that both resources contain is discussion of management practices that foster or deter sustainable development. ISO 26000 includes the section "Guidance on integrating social responsibility throughout an organization," from which inventory indicators related to management practices can be constructed. Similarly, the ISO 26000 section "Guidance on social responsibility core subjects" provides an important basis for indicator construction. ISO 26000 core subjects are Organizational Governance, Human Rights, Labour Practices, The Environment, Fair Operating Practices, Consumer Issues and Community Involvement and Development. Organizational Governance is an over-arching subject that allows organizations to successfully manage other core subjects (International Organization for Standardization, 2013).

4.3.3.10 Extractive Industries Transparency Initiative (EITI)

EITI is global standard ensuing transparency of profits earned from the extraction of natural resources. Leaders from governments, extractive companies and civil society have been working together since 2003 when they agreed on the EITI principles. The EITI promotes greater transparency as per the disclosure of payments to the government from oil, gas and mining companies. They affirm that natural resources can be important drivers of economic growth and social development if the revenues are managed well and transparently (EITI, 2013).

4.3.3.11 UN Guiding Principles on Business and Human Rights

The UN Human Rights Council endorsed these guiding principles in June 2011 in recognition of;

1) States' existing obligations to respect, protect, and fulfill human rights and fundamental freedoms.

2) The role of business enterprises as specialized organs of society performing specialized functions, required to comply with all applicable laws and to respect human rights.

3) The need for rights and obligations to be matched to appropriate and effective remedies when breached.

The guiding principles apply to all states and all business enterprises, both transnational and others, regardless of their size, sector, location, ownership and structure (United Nations Human Rights, 2013).

4.3.4 A Regional Perspective: Sustainability Disclosure in Asia

There is growing practice of stock exchange listing resulting in more disclosure and more companies reporting. The increasing number of third parties are rating companies and addressing the needs of investors. The parties include NGOs, investors, academics and other stakeholders. The companies are under increasing and varying levels of scrutiny and have to respond. It is predicted that consumers are expected to be increasingly involved in the process of rating companies on sustainability, as rating agencies engage consumer opinion to provide insight into corporate practices. Generation Y is the group that will push the sustainability rating agenda since these people will increasingly seek information about company operations. In the future, it is expected there will be a consolidation of ratings to a few credible ones, with these ratings increasing the complexity of their rating systems to capture the holistic ideals of sustainability.

Stock exchanges are one of the biggest drivers of disclosure in Asia with Singapore Stock Exchange, the Hong Kong Exchange, and Bursa Malaysia issuing sustainability reporting guidelines for companies. Stakeholders are another large driver of disclosure, especially activist organizations demanding information on company operations in specific areas. To attract top talent from Generation Y, companies will be forced to become more sustainable and disclose their positive impacts on society and the environment.

The Asian Sustainability Ratings (ASR) was developed to answer the recurring question of “who is the best at CSR?” A diverse set of stakeholders were interested in the answer, and so the ASR was born as way to measure company

sustainability disclosure which in turn serves as a proxy for performance. The ASR is an index of 100 sustainability indicators against which companies' publicly disclosed information is rated. Responsible Research undertakes the analysis of the companies, whereas CSR Asia provides the analysis to companies keen to know how to improve their sustainability disclosure. CSR Asia provides ASR Company and Peer Reports which provide an analysis of company ratings with recommendations for some next steps in reporting. Companies can also use these ASR reports to evaluate reporting, peer benchmarking, and for internal leverage with management.

Asian Sustainability rating is a tool for investors developed in partnership by responsible Research and CSR Asia to rate company CSR disclosure in Asia. Companies should pay special attention because of the social concerns…the asset allocation to emerging markets is increasing and there is substantial growth in Responsible Investment/ESG (PRI-Principles for Responsible Investment (www.unpri.org) The global share of RI AUM (asset under management) has been increasing steadily up to 15-20% of total global AUM which by 2015 is projected to be around $26 Trillion. It is vital because public expectations of companies are changing and they are put through increasing scrutiny and significant opportunities. The investors also care because sound ESG management can influence the levers that companies use to create value.

The potential impact of sound ESG management lead to a stronger brand and greater pricing power and greater operational efficiencies, more efficient use of resources, supply chain optimization, lower costs, enhanced ability to attract, retain and motivate employees, greater employee productivity, improved customer loyalty, enhanced ability to enter new markets, new potential source of revenue, lower market, balance-sheet and operational risks, lower costs of capital, greater access to capital financing and insurance. Investors want and do expect from companies to provide relevant information, identify key CSR issues for sector/company, link CSR issues to corporate strategy (risk/opportunity), insight over a longer-term period, address controversies/tomorrow's material risk, explore reporting recognized reporting templates, do something-start somewhere and commit to improvement over time.

Investors are interested in sustainability. For example-public health trends indicate obesity will be an escalating social and economic burden in Asia, with

implications for companies. F&C initiated a dialogue on governance and sustainability between investors and companies. Investors use tools such as personal meetings, CLSA corporate Governance Watch, sustainability reports and specialist research e.g. Sustainalytics. Investors face some distinct challenges about company's willingness to listen? Understanding with companies that the dialogue is about i.e. value protection, nature of dialogue e.g. constructive and two ways, implementation and performance date. The dialogue can be improved by companies developing a proactive sustainability strategy, communicate on how well positioned you are for sustainability challenges and publish meaningful annual sustainability reports. Investors on the other hand can demonstrate a real intent in ESG issues, explain how these issues are factored into the investment process, make concrete recommendations and meet companies in person. Companies in Asia should increase their awareness on food security: commodity markets, nutrition and product safety, climate change and water: power utilities and water, local communities: including in conflict-affected areas, employee relations: mining sector, factory labour standards, nuclear: safety risk and emergency preparedness. Companies should also demonstrate business leadership in sustainability strategy, build a strong governance culture including in business ethics and adopt global good practice in sustainability reporting. In emerging markets Investors equity ESG strategy should be to invest in companies driving or benefiting from sustainable development trends, with emerging markets; avoid investing in companies with poor corporate governance or unsustainable operating practices; improve- use influence as investor to encourage best practice management of environmental, social and governance issues through engagement and voting. F& Cs emerging markets equity ESG strategy seeks actively invest in companies that stand to benefit from substantially contribute to trends in sustainability development. The six themes are, Infrastructure for Development (Transportation, Utilities, and Construction), Financing the Future (Banks, Insurers, and Exchanges), Rise of Low Income Consumers (Retail, Housing, and Consumer Goods), Human Capital (Health, Education, and Social Services), Access to new Technologies (Mobile Telecommunications, Internet Services, and Consumer Electronics), Energy for Growth (Renewal Energy Products, Traditional Energy Products).

Minimum ESG Standards are; Good governance-companies are required to meet specific corporate standards linked to board independence, shareholder rights, transparency and disclosure. Clear commitment to sustainability-companies must demonstrate clear commitment to sustainability business practices such as environmental management, fair and decent workplace practices, business ethics and human rights. Due diligence and monitoring-Beyond a stated commitment to good ESG practices, F&C will review its engagement and voting database, plus external research to identify and evaluate any potential areas of concern or improvement.

4.4 Strategies for Transition to Sustainable Development

The indicators assessed in this study are some of the most important inputs to economic and social development. Climate change and growing resource demand around the world present dual challenges that have significant economic, social and environmental implications. In response to these challenges the use of energy and water is undergoing a major transformation. Resource efficiency and renewable energy are central corporate ability to achieve this transformation and they are increasingly considering a range of renewable energy supply options. Observation of literature and policy discussion in suggests that this issue poses a challenge for rational policy making as because of its complexity.

4.4.1 Government Expectations and Corporate Response

It is recognized that a number of governments have proactively legislated, guided and shaped the direction of CSR but it becomes challenging for corporations to meet. For example actions of governments in China, India and Indonesia (the three most populous countries in Asia) have varying expectations from corporations in each country and the projections ahead. Businesses have a responsibility to give back to the community, especially foreign companies as a demonstration of goodwill and commitment. In context of financial service dimension, it can be difficult to demonstrate CSR policies; however corporate governance is increasingly seen as a measure. It is expected from foreign companies that global best practices will be applied. Differences reduce as legal system develops and government is able to

enforce regulations. A voluntary approach can be effective but legislation encourages broader adoption. Regulation however, needs to be in line with international best practices. Trends in Asia-Pacific see environmental agencies growing in countries across the region. Stock exchanges also requiring CSR reporting and there is greater focus on corporate governance by regulators. Towards best practice commitment, companies should roll out global programs in the region and also help government navigate the CSR landscape.

Progressive European countries have taken the lead on promoting renewable energy historically are now joined by other countries involved in new forms of energy. The key to getting green growth is actually getting political commitment behind it because investors are very sensitive to that. Governments' needs to set the framework that enables companies to make investment that are profitable and move the energy system in sustainable direction. London Array is the largest offshore wind energy farm in world. Its 175 turbines will be capable of generating enough energy to power nearly half a million homes and reduce harmful CO_2 emissions by over 900,000 tons a year. UK is the first country to set legally binding carbon budgets. The green sector makes up 8 percent of GDP in the UK. The Department of Energy and Climate Change has committed 200m pounds to funding for low-carbon technologies between 2011and 2015. 35m pounds have been earmarked to support the development and demonstration of innovative technologies and systems that can reduce carbon emission from buildings. The UK is the first country in the world to set up a Green Investment bank, with 3bn pounds of investment.

4.4.2 Corporate Perspectives on Resource Efficiency

The importance of businesses adopting resource efficient practices, both for improving their bottom line impact and for consumer demand are paramount in current global climate. There is growing call for setting limits on growth by subscribing to the Gandhian principle- "Earth has enough for everyone's need, but not for a single man's greed." The categorical changes required to achieve sustainable growth can be brought about by circular transition involving reduction in emissions, developing new systems at microeconomic levels, and sharing the knowledge and technology. In the absence of strong political will, there is a need for business houses to lead by example and strive for green growth. The corporate must leave the race of

indiscriminate selling and that too at quick intervals. For sustainability, recycling is an economical and desirable option. The middle class, being the major consumer of goods, should be educated about the importance of recycling and reusing instead of throwing the goods away.

There are several instances where with right determination and support, a positive impact can be seen. The incentive to make a transition to greener lifestyle is to show the companies as well as consumers the economic benefit that accrues over time by adopting energy efficient measures. For example, renewable energy is a business opportunity in India as 400 million people here alone live in energy poverty. For transition towards green growth, the golden triangle comprising governments with clear goals, corporate with ethical wisdom, and consumers with human way of living life, needs to be synergized. The business houses should be evaluated on the basis of not only their financial performance, but also on their natural capital and social returns.

4.4.3 Sustainable Challenges Across Sectors

The geographic colonization of the past and inter generational colonization of the ill-effects of environmental damage have cast unprecedented damage. The lack of mechanism to calculate/measure ecosystem cost in the context of resource efficiency, intergenerational equity, happiness, etc. The critical question arise now “Are consumers fully aware of sustainability?” People are often reduced to the category of consumers, but in terms of sustainability we need to adopt a broader perspective. The seven challenges of sustainability lies in carbon budget, physical impact, economic costs, time frame, more adaption and less mitigation, and people and institutions. There is need for sectoral studies at the national and sub-national levels. The cross-cultural influence on sustainable development through cities makes a positive impact. For example Copenhagen, a city, aiming to be the first carbon neutral city by 2025 and government plays a critical role in enabling businesses and engaging people towards adopting sustainable undertakings. However, the sum effect of civil society and government is not sufficient and integrated innovative measures need to be undertaken. The three general aspects of sustainability-the convergence of technology, innovation and industry, and collective ownership can prompt the need to perform by

creating value by finding climate solutions that deliver. Sustainability could be looked at in terms of new revolutions with regard to technologies.

4.4.4 Supply Chain: Innovative Engagement for Sustainable Value Chains

After two decades of NGO activism, numerous projects to improve supply chain conditions, and innumerable audits, many are questioning what can really be done to create sustainable supply chains. There are no definitive answers, but there are some innovative forms of engagement between brands, suppliers, NGO's and workers.

People have a right to know where products come from, what they're made of, and how they impact people and the environment. Environmentalists and advocates for sustainability and social justice have been arguing for years that consumers need to know more about where products come from. The measurement about a product, whether it's the quality, safety and social impact, or just the ability to confirm that a consumer is buying what they think they are buying, the only way to measure these things is by knowing where things come from. One of the things that are most crucial in modern supply chains is being able to know the geographic source of raw materials, and it is also one of the pieces of information that is most often missing from corporate data bases.

The problem is historic. Products are incredibly complex, and for hundreds of years now, humans have been making products that come from dozens of different countries, that pass through countless ports and are distributed around the world. In the past it was almost impossible to know where a product came from, but that has changed with the advent of the Web, new mapping and satellite techniques, crowd sourcing and social networking.

Drivers towards a sustainable Supply Chain starts with Company Management who is forced to rethink scarce resources and unstable prices mean competitive advantage. Market is influenced by Consumers who are environmentally conscious and put pressure on market. Government in turn introduces stricter domestic and international regulations. The successful manufacturing companies of the future will have to follow some significant trends- invest in people to maintain their loyalty and use their talents, minimize consumption of resources through environmental management, consult workers to help create highly efficient production, create safe and efficient

factories that are attractive to work in…Factories also need to manage and improve their efficiency, recruit and retain the best employees, adopt global manufacturing best practices, meet customer requirement (quality/price/labour standards). The retailers will have to achieve competitive pricing through efficient production. They also need to achieve low total cost acquisition (price, quality, and delivery), high labour standards, and good governmental management.

Benefits of sustainable supply chain reach out to businesses, customers and environment, leading towards sustainable future. CSR is not just about company doing its own activities for the environment. It now includes taking steps to encourage those you do business with to take care of environment with you.

Sourcemap is a crowd sourced directory of supply chains and environmental footprints. Below is a snapshot of Apple sourcemap, one of the most recognized brands around the world, shows how complex the origin and distribution of a product can be spanning across the globe.

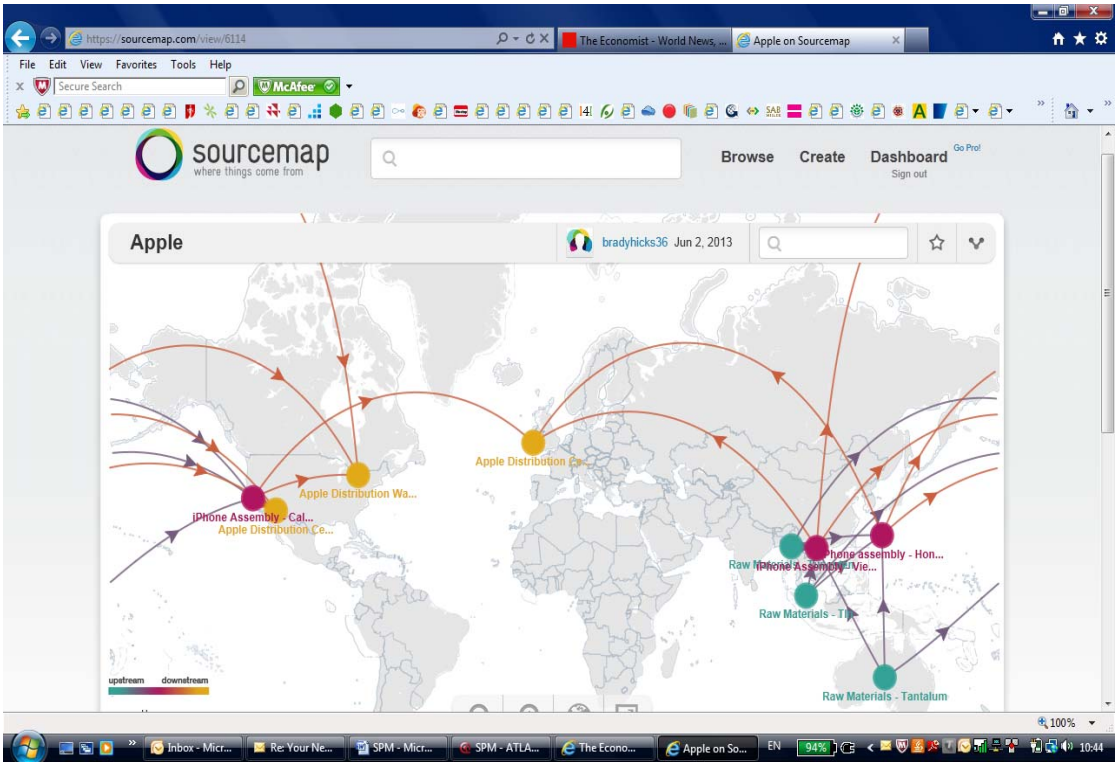


Figure 4.17 Source Map Snapshot

Source: Sourcemap, 2013.

Many supply chain management initiatives start with performance measurement. Leading consulting firms utilized cross industry platforms like Supply Chain Operations Reference (SCOR) model, a standard to deliver performance measurement. Example of this metrics is as below;

Table 4.17 SCOR Supply Chain Metrics

Process	**Metrics**
Plan	Compliance costs/Non-Compliance costs
Source	% of orders received with correct packaging
	% of supplies with current EMS system
Make	Energy costs as % of production cost
Deliver	Fuel cost as % of delivery costs
	% of carriers meeting environmental criteria
Return	Product return as % of product delivered
	Returned products disposed vs. manufactured
Cross-Process	Carbon Emission (Tons CO2 e)
	Liquid and solid waste generated (Hazardous and Non-Hazardous)
	% of recycled waste

Source: Supply Chain Council, 2013.

Solidaridad is founding organization of the fair-trade initiative taking converging Fair & Sustainable Supplies (FSR) to CSR, Founded in Netherlands, with 30 years' experience in promoting fair and sustainable supply chains from producer to consumer, It strives to make markets work for the poor. It has 9 regional centers in Europe, Latin America, Africa, and Asia running more than100 projects on sustainable supply chain. It strives in developing sustainable value chain by linking Producers, Traders, Companies and Consumers.

Table 4.18 Convergence of FSR to CSR

FSR	CSR
▪ Supply Chain	▪ Value Chain
▪ Compliance	▪ Partnership
▪ Audits	▪ Capacity building
▪ Certification	▪ Measuring Progress
▪ Vertical Intervention	▪ Holistic approach
▪ Shareholder engagement	▪ Shareholder involvement

Source: Solidaridad, 2012.

4.4.5 Strategic Disaster Preparedness for Sustainable Outcome

Disaster resilience will pay a key role in sustainable growth. The prospects for emerging Asia's carbon emission growth remains strong, but the opportunity to shift to low-carbon growth must be sought sooner than later or else the mitigation costs could be as much as 2-5 times more. Companies often contribute significantly after disasters occur. A growing number of organizations are now shifting their attention to provide solutions before disaster occur. These include educating inhabitants in disaster prone areas about issues such as emergency evacuation, upgrading skills of emergency response teams so they are more effective when disaster occur, and working with local NGO to build capability to respond in the aftermath. A multi-governmental, multi-sectoral, and multi-disciplinary collaboration is required for attaining a disaster-resistant state. While many developing economies are adopting development models based on competitive green industries and green technologies, these experiences can be scaled up, replicated, and adapted further. The magnitude of the problem is huge as between 1970 and 2010; 1.7 million hazards related deaths occurred in Asia alone. Disaster losses are rising more rapidly than the region is expanding economically. A number of man-made factors like the demographic pressures of urbanization, informal settlements, and climate change are also significant in this regard. Pricing carbon alone is not sufficient to generate the needed flow of technology and finance across the border. Nations should work together to make low-carbon products and services even more cost effective.

4.4.6 Professional Capacity Building and Partnerships for Sustainability

Research shows that CSR practices is growing quickly in Asia as companies face complex sustainability issues and stakeholder expect increasingly sophisticated strategies to tackle them effectively. Also, the building blocks for establishing, developing and maintaining good partnerships between corporate and community based organizations are essentials to get right when working in partnerships. Cross sector partnerships create value for companies in the form of competitive advantage through better products and services, enhanced reputation, attraction of capital and staff motivation. For NPOs the partnerships bring financial and non-financial resources in order to help facilitate delivery of core objectives.

CSR should be developed as a new discipline by providing professional higher education and training. CSR is a mindset and education can help how to think CSR. The quality of human lives and that of what is produced made or build depends precisely on the quality of thought. Its mindset needs to be matched with worldview, it is like operating system and needs upgrading from time to time. “One’s mind, once stretched by a new idea never regains its original dimensions” Oliver Wendle Holmes. “We can’t solve problems by using the same kind of thinking we used when we created them” Albert Einstein. Connecting the dots…how to connect social and environmental issues with a strategic business model? Empower to think different and to make a difference.

Academy of Business in Society (ABIS) is a unique alliance of companies, business schools and other institutions committed for promoting more sustainable business practice through partnership, learning and research. At present, ABIS has over 130 members and reaches 3500+ businesses through affiliated networks. It brings together global thought-leaders on the role of business in society and the growth is driving an expanded value proposition based on new models of collaboration and partnership. ABIS promotes business role in society through thematic broadening via Governance, Sustainability (Global macro trends, Non-financial performance, and Enterprise innovation), Ethics & Leadership (CSR, Practical Wisdom, Values) Purpose of the firm (Corporate Governance, Future Economic Strategy). Its other activities and focus are setting a global agenda, to accelerate international action coupled with commercial growth and innovative

partnership. Its strategic corporate partnership with IBM consists of building capacity and capability in developing markets, experiential learning; with Johnson & Johnson in advancing health decision making in global context, managing stakeholder media; with Microsoft in cloud computing and competitiveness, enabling technologies for low carbon economy, with Shell in sustainability and innovations in executive development, global governance and scenarios for sustainability; and with Unilever in Social branding and sustainability, the future of marketing. The key dimensions of ABIS programs facilitate participant's engagement with stakeholder audience in structured dialogues at leading business schools. The emphasis is on integrating external/societal dilemmas and concerns with internal strategy and operations.

4.4.7 Employment and Growth Benefits Through Sustainability

The key questions businesses face where the business opportunities lie when it comes to tackling the challenges of climate change and achieving green growth, such as improved social equity, greater job opportunities, and a smaller carbon footprint. The need to have greater transparency and accessibility to government data to facilitate better analysis and insights into the energy sector with initiatives, such as open Government partnership being mentioned. The need for a rapid transformation of the energy marked by encouraging new players together with the role of technology in achieving green growth is critical, and that bigger opportunities lie in resource efficiency. However, the new challenges are to improve the efficiency of older industries and the creation of new jobs with the goal of inclusiveness in mind. While greater employment opportunities would be created by shifting to a green economy, currently there exists a mismatch between jobs and skills and the education sector needs reforms to resolve this mismatch. It was agreed that financing is the key to achieving green growth and markets should be allowed to develop. There is a need to further evaluate existing programmes to bring out possibilities for the future, and while optimism is good, it has to blend with realism. The need for affordability as a goal and on the subject of whether new institutions, such as Green Banks were a necessity, economy could do better by further enhancing the existing institutions.

4.4.8 Inclusive Business: Innovative Strategies for Economic and Social Development

Many companies are seeking to better develop inclusive business approaches as part of a central business strategy to expand market access which also link to community, investment strategies and ideas of poverty alleviation. While such approaches can bring opportunities in new markets, there are also opportunities to 'create shared value' through products, services and business innovations. The innovative new approaches' to development brings some successes as well as some lessons learned. The Base of Pyramid (BOP) presents growth opportunity in market. The BOP is composed by the group of population, lower income, and quality of life and welfare conditions. The BOP is characterized by- poor market access, unmet basic needs, informality, BOP penalties, lack of knowledge and skills, rural mainly, but also urban, 70 % depend on agriculture, source of skilled and unskilled labour, productive and distribution capacity and innovation. The BOP globally are 3.7 billion 0r 60% of world's population. They have a collective income of $2.3 trillion (spends 1.3 trillion on food) with an average annual growth rate of 8%. It is critical market segment for growth and job creation/income generation. BOP is the largest and fastest growing emerging market in the world.

In Asia there are more than 2.1 billion people living with less than $3 a day. They represent 83% of region's population and 42% of its purchasing power. The BOP market has an aggregated income of more than US$3.47 trillion per year. This scenario presents large potential for inclusive wealth creation. Women are emergent global force and their economic empowerment demands Women control $20 trillion or 2/3rd of worldwide spending and share 66% of the world's work. Ironically they earn only 10% of world's income yet reinvest 90% of their income into family & community. Upton 86% of small shops are owned and managed by women. Inclusive Business is a powerful and profitable model and a 'win-win' relationship for both companies and low income communities. The Inclusive Business is a business initiative that seeks to incorporate into the company's value chain to low-income population, generating a win-win relationship. This initiative creates a growth, productivity and new opportunity for the company, at the same time generating income and wealth for the poorest.

4.4.9 Organization Health & Safety for Sustainability

The importance of Organization Health and Safety (OHS) as a major indicator of an organization's overall sustainability has not got into mainstream sustainability reporting and large number of reporting organizations do not use OHS indicators compliant with GRI recommendations, and OHS reporting as a whole. Organizations are further hindered in OHS reporting by lack of common OHS terms and formulas. The OHS disclosure often lacks transparency with regard to providing a meaningful perspective on OHS performance. 'Centre for Safety & Health Sustainability' recommends a well-defined and standardized terms and definitions that allows for accurate evaluation of organization's performance and standardized data collection methodology that allows stakeholders to easily compare safety performance across organizations. Evidence suggests that organizations that internalize proactive OHS tend to be more sustainable overall compared to those that do not.

4.4.10 Sustainability Through Change Management/Environmental Change Agility

Today's organizations are dealing with complexity and uncertainty on a scale that has never been seen before, climate change, environmental issues, energy choices, economic and social upheaval is changing the game faster than we can learn it. Unfortunately, many companies are designed for business as usual, for a time when there is no change; it runs efficiently and at full speed. Change is often viewed as something to be overcome, controlled and a disruption to this known world, rather than the new 'norm' that needs to be managed. This new 'norm' means requires agility to be able to constantly adapt and change to meet economic, compliance and competitive challenges. A truly agile organization is able to meet these challenges through projects that are nimble and constantly assessed and adjusted by a knowledgeable and informed leadership, and in a way that is routine and normal for employees.

Innovation tools and the other management tools are the means that a manager has to influence the organization's behavior or environment. The organization's people and environment are always changing and this rapid change can cause stress in people and organizations. Sustainability is also a form of change and part of

innovation in the organization. The pace of change and the stress on organization is increasing due to technology, rapid communication and a more crowded interdependent planet. Agility, creativity and speed are more important than ever and these trends are likely to continue.

4.4.11 Social Media Implications

Social Media and sustainability are intrinsically interlinked. “The world in the era of connectivity in the form of social networking has transformed from being a connected world to being a hyper-connected world, and from being an inter-connected to interdependent world” (Friedman). Social media is forcing businesses, politicians and leaders to be more socially responsible. Most successful leaders and businesses in the future will be those who are the most socially responsible. Despite companies agreeing that they need to utilize the social media in their sustainability strategy few really understand the terrain. The lack of knowledge either lead to fear of unreasonable expectations about what companies can achieve with social media, or poor decision that increase the potential of risk to the company brand. The contours of a rapidly growing social media should be navigated to gain insights into how social media users think and how companies might navigate what is still relatively unchartered water. The context on which companies should work is that the world is shaped by two main forces-Markets and Mother Nature. In this context, the key accounting principles being applied are “under pricing the risk, privatizing the gains, and socializing the losses”. There a massive shift in values, the present on the situational values and so the future should be on re-generation values, i.e. bringing sustainable values back to the market and Mother Nature!

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This research found that as concept, sustainability is able to capture imaginations and aspirations of present generation; however it weighs considerably less in comparison to development goals. As an identifiable and measurable goal it eludes many indicators. There is universal need to be able to developed indicators to measure and monitor economic, social and environmental conditions, thus to measure sustainability and maintain accountability for future generations. A variety of strategies, alliances and partnerships, and approaches are being used around the globe. The scope of this study extended to 80 corporations leading in sustainability practices. It is important to note that fifty one of the one hundred largest economies in the world are now corporations, not nations. One hundred largest multinational corporations now control about 20 percent of global foreign asset and 40 percent of world trade occurs within these top multinationals.

The study found that Sustainability has emerged as an important area of soft law self-regulation for corporations with increasing number of voluntary and mandatory regulatory framework dissemination from grassroots to international consciousness. The study found significant inconsistencies and inadequacies among company reports undermine the comparability and usefulness of this information. For instance in the environmental indicators measure disclosures (reviewed in Chapter 4), 80 corporations report measurement information, but not all companies report the standard information or to the same extent, making direct comparisons difficult or impossible. Similarly their explicit annual sustainability report practices shows variation in scope, depth, precision and credibility of enterprise and investor communications on their responsibilities, making systematic analysis difficult. This is of importance to policy making, as claims about the social, environmental and governance challenges lack an

accurate picture of the landscape, particularly acute in areas such as climate change, that are of rapidly increasing importance in terms value creation and integration.

70 percent of the companies disclosed information using GRI framework, a non-binding but most accepted reporting framework. However, only 50 percent companies disclosed sufficient data. Sustainability reporting is a starting point to meaningful engagement on corporation's social and environmental performance. A total of 30 corporations (tier 1 & 2) were found to be best performing corporations in line with the criteria set for this study. This is by no means vindication of their overall sustainability performance which is to be judged by an extensive analytical framework covering broad spectrum of indicators as opposed to limited but vital indicators used for this study. Taking both groups into account, 37% corporations are judged to be employing best practices based on vital environmental indicators.

Indicator wise analysis reveals that 72 percent corporations reported Emission data that was the best performing result followed by 50 percent Energy data, 49 percent Waste data, 47 percent Water data, and the lowest 34 percent corporations reporting Recycling data. On average 13 percent corporations reported partial data for all five indicators while over a third corporations, failed to report data on average for all five indicators. The Emission disclosure of 83 percent (full and partial data) followed by Energy disclosure 63 percent (full and partial data) suggests that Emission and Energy disclosure is a mainstream practice among large corporations.

Most large Corporations have found to be reporting high level of non-financial information (Environmental and Social) however, significant inconsistencies and inadequacies among company reports occurs that undermine the comparability and usefulness of this information. There are limitations in current forms of reporting and analysis in describing the actual social and environmental impact of companies because they are non-binding. Reporting is created by the company, and even if verified, it is a corporate view. The most pressured companies are likely to adopt environmental policies and reported their sustainability performance earlier than others. This can often result in companies with the most significant impacts rating among the best performers.

The analysis performed in this study was based on publicly available data and information provided by the companies themselves. It is evident in this regard that

that data consistency was the biggest challenge in applying the value and measurement approach in the differences in data availability and data quality between the companies assessed. Not all companies published figures that were suitable for a direct comparison with other companies. Most of the corporate data published had to be subsequently corrected. Sustainability reporting needs accelerated implementation to get in alignment with financial reporting. Although widely acknowledged standards such as GRI Guidelines do exist, its application in practice still lacks consistency. This refers particularly to a harmonized and transparent presentation of data in order to ensure comparability. The sustainability measurement, however proved to be a robust and meaningful analysis tool providing informative and comparative results on the sustainability performance of companies. A better data base would provide more meaningful and robust results of the analysis. As the results of this study have shown, companies vary not just in respect of their environmental performance, but also in terms of scope and quality of their compliance, disclosure and reporting.

The study also found that sustainability reports and disclosures need to distinguish between the issue of materiality to an organization and the materiality to society as they are not always the same. The estimation on materiality is generally made independently by analysts for its relevance to the organization or community. An externality that may not be material to organization may have direct material impact to shareholders. It is also critical to have enhanced transparency while assessing materiality and not being blindfolded by short-term interests. ESE communications have now become widespread and with time should address gaps in benchmarking and target setting, units of measurements and lack of universally accepted measures and standards such as international practices of financial reporting. Sustainability communications demonstrate engagement of organizations wider responsibilities, but not always providing concrete comparable data on social or environmental performance. Unless reporting is produced in a consistent and comparable manner, it is difficult for policy makers, investors and other stakeholders to use it to make informed decisions. Policy makers could promote an internationally harmonized approach to the way companies explain, calculate and define sustainability indicator. GRI is a great initiative which is becoming industry standard and is most commonly used as a reporting and disclosure practice.

The climate crisis of the 21st century has been caused largely by just 90 companies, which between them produced nearly two-thirds of the greenhouse gas emissions generated since the dawning of the industrial age, new research suggests Majority of the firms were in the energy and resource sector and half of the estimated emissions were produced just in the past 25 years (Heede, 2013). Corporations around the globe have an immensely important role in solving climate crisis. It should not fall to governments alone to act on climate change. A more comprehensive accounting of the sources of greenhouse gas emissions would make it easier to achieve the emissions reductions needed to avoid catastrophic climate change scenario from a carbon-intensive energy system to a carbon-neutral energy system. According to present measurements, the sustainable level on earth of 350 ppm (parts per million) carbon is currently being exceeded at about 400 ppm. The world is already leaving beyond sustainability and with growing population and development demands, sustainability remains an elusive target. However, knowledge can provide the best answers to humans and sustainability performance measurement is an important tool to take stock of our resource demand vs. earth's carrying capacity. Leading Corporations have taken a lead to a great extent and coupled with effective public policy a reverse process can begin where the equilibrium is found for a sustainable planet.

A broad range of sustainability standards persist among the large variation and standards in their degree of specificity and applicability to particular industries and business operations. The United Nations has played an important role in this area by introducing significant unifying principles with the launch in 2000 of Global Compact, a voluntary initiative for businesses and civil society, and in 2005 with the launch of the Principles for Responsible Investment, a voluntary initiative for institutional investors. UNGC is most adopted principles with GRI framework. These instruments create important benchmarks, based on universally agreed principles that can assist in providing a framework for analysis. The key challenge remains however constant improvement of analytical tools.

Non-financial reporting will need to continue transition from rhetorical about social and environmental issues, to measuring actual impacts. While illustrative examples of good performance are important, there is also a need to better understand

the connections between public policies and the voluntary private policies of enterprises and investors. This exercise can assist public policy makers in better understanding the relationship between regulatory and voluntary approaches and in better applying the right mix of incentives.

5.2 Policy Implications

The study re-established the notion that issue of sustainability poses a value proposition that is inflicted by a measurement challenge. In the absence of standardized and mandated reporting frameworks for environmental indicators, inconsistencies are likely to continue, thus diminishing the usefulness of such information for policymakers. The challenge is to redefine the conventional economic system that is designed to avoid paying for any external (Environmental and Social) cost. The lack of accurate picture of sustainability landscape poses implications for public policy making that are of important in terms value creation and integration. The paradigm policy shift would require harnessing the financial firepower of global corporations to create a robust incentive structure. It is not enough for corporations to produce social benefits in isolation; they must also support public policies. The important changes in corporate practices and shortcomings of civil regulation indicate that critical dimension of corporate sustainability policy should be its impact on public policy. Corporations are adopting industry regulated policy which is akin to private policy and that can have an impact similar to public policy. As a result, sustainability practice has emerged as an important area of soft law self-regulation which can present policy makers with new options and tools for addressing key development challenges. Most large Corporations now recognize the importance of sustainability issues yet the standard of communication varies widely. There is a role for policy makers to enhance the quality of communications. Various policy options exist such as supporting the harmonization of Sustainability reporting, and mandating such standardized reporting through stock exchange listing requirements.

5.3 Recommendations

As discussed in policy proposition, the issue of sustainability poses a value proposition that is inflicted by a measurement challenge. Internationally harmonized disclosure and reporting would enable international agreements on environmental indicators, as well as provide investors and other stakeholders a clear, comparable view of indicators around the world. The global community has benefitted from common international accounting standards (e.g. International Financial Reporting Standards) and likewise they would benefit from consensus on an internationally harmonized Sustainability model. The paradigm shift would require harnessing the financial firepower and global corporations to create a robust incentive structure. The challenge is to redefine the conventional economic system that is designed to avoid paying for any external (environmental and social) cost, exploiting resources for short-term profits.

Key performance indicator (KPIs) or a performance indicator (benchmarking) is a tool for performance measurement. Balanced Scorecard (BSC) is a widely used management framework to apply KPIs in an organization. An organization may use KPIs to evaluate its success, or to evaluate the success of a particular activity in which it is engaged. These assessments often lead to the identification of potential improvements, so performance indicators are routinely associated with 'performance improvement' initiatives. Traditionally, benchmarking has occurred at the output stage which is further downstream (Anderson 2004) but in recent trends benchmarking is increasingly occurring at the input and process stage, known as upstream elements. Therefore it is clearly evident that benchmarking must evolve from being backward looking static measures to more forward looking dynamic ratios. The lead benchmarking techniques will enable organizations to develop core competencies and sustain competitive advantage.

A Sustainability Metrics Model is proposed (Figure 5.1) that recommends an integrated approach leading to value creation and integration. It provides a comprehensive approach for examining the measurement of sustainability. Resource utilization such as material intensity, energy intensity, water, emission, waste and pollutants are key indicators. However there is no agreed set as the concept will

continue to evolve. As the organizations adopt new indicators, they need to be analyzed and reported. Once the sustainability matrix are established and reflected in the organizations standard operating procedure, they should be integrated into regular performance system. There are some methodological issues raised by measuring sustainability. Many measures are new and have unproven reliability and validity thus it is difficult to know which measure is appropriate for particular sustainability issue. Despite such issues, sustainability matrixes are essential to operationally measure success because organizations always allocate scarce resources to achieve goals because of competition. Without measures of success in sustainability, there is likely organizations will fail in achieving resource efficiency and operational success. Measurement, the force precision in defining goals and force precision in action to achieve these goals provides an indication of the management's seriousness of purpose. Gradually sustainability indicators are being standardized and adopted akin to generally acceptable accounting practices of financial world. Sustainability initiatives are likely to change over time till it becomes a robust strategy. Measurement is essential.

Performance indicators must be developed to monitor and assess the value of sustainability actions undertaken that help quantify the efforts made to improve sustainability performance. Every sustainability initiative undertaken should be associated with a specific sustainability performance indicator. External reporting initiatives to disclose positive environmental and social performance are not only tools of accountability but also ways to promote good sustainability performance to various stakeholders. Each element of sustainability actions must be translated into a metric that will eventually be linked to sustainability performance. All these initiatives are aimed at improving the social and environmental performance of a company's activities.

Corporate value creation in totality can be achieved through the integration of TBL strategies in response to various corporate stakeholders demand for increased information about corporate governance and the impact of corporate activities, especially environmental accountability. Through their actions, companies can either improve or impair their social and environmental performance. Sustainability goals are often broad and to assess performance, organizations must focus on specific issues

or areas of priority. This model can help organizations help implement sustainability strategies and understand both implications and actions to deliver improved performance. Achieving successful sustainability strategy must be viewed over a long time horizon so indicators of performance can be examined. The key to successful sustainability strategy would be to translate the strategy into action before the tipping point is reached.

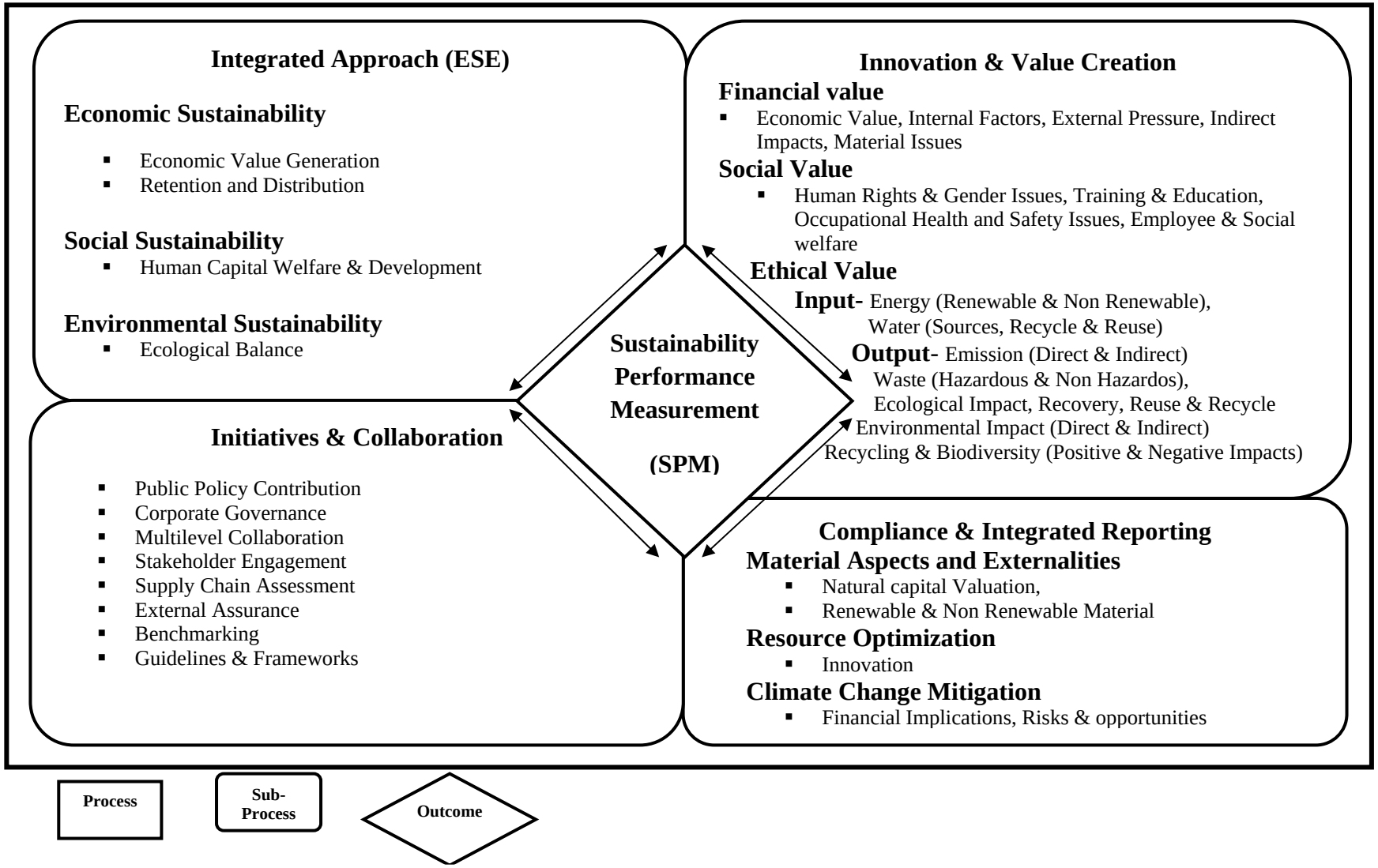


Figure: 5.1 Proposed SPM Matrix: Value-Driven Sustainability Performance Measurement

There are several international frameworks in addition to mandatory and voluntary national guidelines however corporations set their own benchmarks/ baseline as no guidelines are binding. Energy and resource use is the key for any company and major operations are in water stressed regions i.e. mining and food production. The performance of organizations are improving so is volume of production to meet growing population demands and culture of economic prosperity that puts overall bigger impact on environment. The economic incentive for sustainable performance is lacking even for the most engaged corporations of the merits of sustainable performance. Free market capitalism has brought many things in the name of profit and progress but it has also brought about much environmental degradation and there is little incentive to be environmentally conscientious. The weather extremities and natural disaster experienced in last few years have set serious warning for future; however the society have been slow to respond. Landmark treaties addressing climate change and sustainable development have been brilliantly crafted but failed in being implemented. This is because, at present society do not pay the full environmental price its actions although in the long term it is very likely the environmental cost as a society will be very high.

Efficiency is being achieved through innovation but overall demand and consumption is greater than earth's carrying capacity. The sample of study presented in this study are some of the best performing and largest organizations, however they are tip of the iceberg comparing how universal sustainability issues are and which has impact on its outcome and needs to contribute in the ethos of success today without compromising tomorrow. The study found that Co2 emission measurement standards are most universal while energy, water, waste and recycling data measurement have different units of measurement. The researcher used standard conversion methods where possible.

The study found significant inconsistencies and inadequacies among company reports undermine the comparability and usefulness of this information, however sustainability has emerged as an important area of soft law self-regulation with increasing number of voluntary and mandatory regulatory framework dissemination from grassroots to international consciousness. The importance of it is distinguished with the fact that either there is a company exists with sustainable consciousness or

without a license to operate. Sustainable practices will lead to minimum impact on environment while generating optimum value once the planet is put before profit. The current Co2 emission is at the level of near 400 ppm as against scientifically established optimum level of below 350 ppm. The trajectory of development needs to change to avoid the one step forward, two step backwards dilemmas. The earth's carrying capacity can provide enough for need but not greed. The thrust for future is upon measuring the impacts and creating a sustainable planet. Policy makers could encourage wider adoption of one of the existing generally accepted frameworks for emissions reporting framework like GRI-G4 in order to improve the transparency of calculations and the comparability between companies. South Africa has enacted this policy requires all listed companies to report using the sustainability guidelines of the Global Reporting Initiative. Ultimately such frameworks will need to move from the testing grounds of voluntary initiatives to the world of regulatory obligations.

The importance and widespread adoption of CSR communication would over time could benefit from a stronger focus, real transparency and on actual performance, and addressing the limitations outlined would assist in promoting with fair and sustainable outcomes.

Currently, sustainability measurement is being tied to mathematical and statistical value as against the natural value denomination which is beyond total sum of any monetary value. Pursuing a less environmentally friendly course has often been more cost effective due to the fact that the environmental costs, i.e. the impacts of business activities are not fully taken into account with sustainability often acting as a green wash. The paradox of technological innovations is that the problem contains within itself the solution to these problems and technological know-how. The need is for clear plans of action and defined goals to address the problem of climate change with the active participation of civil society. The new approach would require consolidating and integrating financial firepower and global corporations to create an incentive structure. The challenge is to redefine the conventional economic system that is designed to avoid paying for any external cost, exploiting resources for short-term profits.

An integrated solution addressing these aspects needs to be found. A performance measurement framework, with the primary focus of being adaptive and

the secondary focus of operating within a process-driven framework needs to be designed. Design of a dynamic performance measurement system for global organizations is taking momentum in a rapidly growing field and research area.

5.4 Future Research

Based on the research results, three broad directions for future research are suggested. The first direction relates to incorporating methodological modifications that could render a clearer picture sustainability performance measurement within corporations or TNCs. The second relates to scaling down the scope of the study to reveal more focused impacts of sustainability strategies by corporations' at national and local level.

In terms of methodology, the number of case companies however sufficient posed a challenge because of variation in their size and operations. The range for trend analysis shows staggering variations. This has been a revealing trend but a scaled down sample of study with group of companies belonging to sane sector and size would provide more concrete results. Future work in this area, therefore, must take into account not only the need to measure the practices of organization, but also the challenge to continuously improve upon the measurement methodology itself.

Secondly, although the study approach was to investigate corporate best practices in sustainability performance measurement, the scope became broader because of the complex international sustainability scenario. Further research may focus on country and region level operations (such as ASEAN) and may include assessment of single indicator that would reveal its impact at national level. Further, although this study found trends of environmental indicators selected, there was no further analysis in relation to its correlation with economic and financial factors. It would be useful for future studies to examine the relationships between economic, social and environmental factors.

Lastly, it is suggested that future research may look at comparison between companies following different framework/guidelines and their sustainability performance measurement effectiveness. This study found seventy percent reporting companies using GRI framework to measure and report their sustainability performance.

However, there are several other measurement standards and guiding principles in use for general and specific sustainability measurement requirements. Does GRI has the potential to become industry standard and is the right tool for companies to adopt towards integrated reporting is yet to be judged by the business and policy makers alike.

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APPENDICES

APPENDIX A

COMPANY REPORTS REFERRED

Name	URL
Amgen Inc. 2010 Environmental Sustainability Report	http://www.amgen.com
Anglo American plc. Sustainable Development Report 2010: Delivering Real Benefits	http://www.angloamerican.com
Arcelor Mittal Corporate Responsibility Report 2010	http://www.arcelormittal.com
Asiana Airlines Sustainability Report 2010	http://www.flyasiana.com
Bacardi Limited Corporate Responsibility Report 2010/11	http://www.bacardilimited.com
Barclays PLC Citizenship Report 2010	http://www.barclays.com/citizenship
Bayer Sustainable Development Report 2010	http://www.bayer.com
Bell Canada Corporate Responsibility Report 2011	http://www.bell.ca/responsibility
Boeing Environment Report 2011	http://www.boeing.com/environment
Bombardier Corporate Social Responsibility Report 2011	http://www.csr.bombardier.com
BP Sustainability Review 2012	http://www.bp.com/sustainability
CapitaLand Sustainability Report 2011	http://www.capitaland.com
CEMEX Sustainable Development Report 2012	http://www.cemex.com
City Developments Sustainability Report 2012	http://www.cdl.com.sg

Name	URL
The Co-operative Group Sustainability Report 2011	http://www.co-operative.co.uk/sustainabilityreport
Coca Cola Europe Corporate Responsibility and Sustainability Report 2010-2011	http://www.cokecce.com
Cognizant Sustainability Report 2010	http://www.cognizant.com
Constellation Energy Corporate Social Responsibility Report 2010	http://www.constellation.com
Credit Suisse Corporate Responsibility Report 2012	http://www.credit-suisse.com
CSL Limited Global Corporate Responsibility Report 2012	http://www.csl.com.au
Danisco Sustainability Report 2010-2011	http://www.danisco.com
EDC Corporate Social Responsibility Report 2010	http://www.edc.ca
Emirates Environmental Report 2010-2011	http://www.emirates.com
Exxon Mobil Corporate Citizenship Report 2011	http://www.exxonmobil.com
Fluor Sustainability Report 2010	http://www.fluor.com
France Telecom Corporate Social Responsibility Report 2010	http://www.francetelecom.com
GE Citizenship Report 2010	http://www.gecitizenship.com
Henkel Sustainability Report 2012	http://www.henkel.com
Hess Corporation Corporate Sustainability Report 2011	http://www.hess.com
HSBC Sustainability Report 2010	http://www.hsbc.com
Hydro Quebec Sustainability Report 2010	http://www.hydroquebec.com/sustainable-development

Name	URL
IATA Annual Report 2011	http://www.iata.org
IBM Corporate Responsibility Report 2011	http://www.ibm.com/responsibility/2011/
IDB Sustainability Report 2011	http://www.iadb.org
Kellogg's Corporate Responsibility Report 2011	http://www.kelloggs.com
Kinross Corporate Responsibility Report 2011	http://www.kinross.com
L'Oreal Sustainability Development Report 2011	http://www.loreal.com
Lafarge Sustainability Report 2010	http://www.lafarge.com
LAN Sustainability Report 2011	http://www.lan.com
Land Securities Corporate Responsibility Report 2011	http://www.landsecurities.com/responsibility
Marathon Oil Corporate Social Responsibility Report 2011	http://www.marathonoil.com
Marks and Spencer Annual Report and Financial Statement 2011	http://www.marks-and-spencer.com
Merck Corporate Responsibility Report 2011	http://www.merck.com
Microsoft Citizenship Report 2012	http://www.microsoft.com
Motorola Mobility Corporate Responsibility Report 2010	http://www.motorola.com
NCB Sustainability Report 2010	http://www.alahli.com
Nexen Sustainability Report 2011	http://www.nexeninc.com
Noble Energy Inc.	http://www.nobleenergyinc.com
OXY Social Responsibility Report	http://www.oxy.com
Philips Annual (Financial, Social &	http://www.philips.com/sustainability

Name	URL
Environmental Performance) 2012	
Provident Financial Corporate Responsibility Report 2010	http://www.providentfinancial.com
PTT PCL Corporate Sustainability Report 2012	http://www.pttplc.com/en
Qantas Sustainability Review 2012	http://www.qantas.com
Repsol Corporate Responsibility Report 2010	http://www.repsol.com
RWE Energy Responsibility Report 2010	http://www.rwe.com
SAB Miller Sustainable Development Summary Report 2011	http://www.sabmiller.com/sd
SCG TH Sustainability Report 2011	http://www.scg.co.th
Shell PLC Sustainability Report 2011	http://www.shell.com
Singtel Sustainability Report 2013	http://www.singtel.com
Singapore Airlines Environmental Report 2011/2012	http://www.singaporeair.com
Southwest Airlines One Report 2012	http://www.southwest.com
State Street Corporate Responsibility Report 2010	http://www.statestreet.com
Sulzer Sustainability Report 2012	http://www.sulzer.com
Symantec Corporate Responsibility Report 2012	http://www.symantec.com
TE Connectivity Corporate Responsibility Report 2011	http://www.te.com
Teck Sustainability Report 2011	http://www.teck.com
Telstra Annual Review 2012	http://www.telstra.com.au/sustainability
Telus Corporate Social Responsibility	http://www.telus.com

Name	URL
Report	
Toyota European Sustainability Report 2012	http://www.toyota.eu
Tullow Oil Corporate Responsibility Report 2010	http://www.tullowoil.com
Verizon Corporate Responsibility Report 2010/2011	http://www.verizon.com/responsibility
Virgin Atlantic Sustainability Report 2012	http://www.virgin-atlantic.com/changeisintheair
Virgin Australia Annual Report 2011	http://www.virginaustralia.com
Vodafone Group Sustainability Report 2011	http://www.vodafone.com/sustainability
Westpac Group Annual Review and Sustainability Report 2012	http://www.westpac.com.au

APPENDIX B

LIST OF CORPORATIONS INCLUDED IN THIS STUDY

#	Company	Country	Sector
1	Adidas	Germany	Sports
2	Air France-KLM	Netherlands, France	Airline
3	Amgen Inc.	US	Pharma
4	Anglo American plc	UK	Mining
5	Arcelor Mittal	Luxembourg	Mining, Steel
6	Asiana Airlines	Korea	Airline
7	Bacardi Limited	Bermuda	Alcoholic Bev
8	BAE	UK	Aerospace
9	Barclays PLC	UK	Banking
10	Bayer AG	Germany	Health care
11	Bell Canada	Canada	Telecom
12	Boeing Corporate	US	Aviation
13	Bombardier	Canada	Aircraft, Train
14	BP plc	UK	Oil & Gas
15	CapitaLand Limited	Singapore	Real Estate
16	Cathay Pacific	Hong Kong	Airline
17	City Developments Ltd	Singapore	Property Dev.
18	Cemex S.A.B. de C.V	Mexico	Cement
19	Coca Cola Europe	Belgium	Beverages
20	Cognizant Technology	US	IT
21	Constellation Energy	US	Energy
22	Credit Suisse AG	Switzerland	Banking
23	CSL Limited	Australia	Biotech
24	Danisco A/S	Denmark	Food
25	EDC	Canada	Export Dev.
26	Emirates	UAE	Airline
27	Exxon Mobil Corp.	US	Petroleum
28	Fluor Corporation	US	Engineering
29	France Telecom	France	Telecom
30	Freeport McMoran	US	Mining
31	General Electric	US	Technology
32	Henkel	Germany	Home Care
33	Hess Corporation	US	Oil & Gas
34	HSBC Holdings plc	UK	Banking
35	Hydro Quebec	Canada	Elec. Gen.
36	IATA	Canada	Aviation
37	IBM Corporation	US	IT

#	Company	Country	Sector
38	IDB	US	Banking
39	Kellogg's	US	Food
40	Kinross Gold Corp.	Canada	Mining
41	L'Oreal S.A.	France	Cosmetics
42	Lafarge	France	Cement
43	LAN S.A.	Chile	Airline
44	Land Securities	UK	Real Estate
45	Marathon Oil Corp.	US	Oil
46	Marks & Spencer	UK	Apparel, Food
47	Merck	US	Pharma.
48	Microsoft Corporation	US	Software
49	Motorola Mobility	US	Telecom
50	NCB	Saudi Arabia	Banking
51	Nexen Inc.	Canada	Oil & Gas
52	Noble Energy Inc.	US	Oil & Gas
53	OXY Oil Corp.	US	Oil & Gas
54	Philips Electronics	Netherlands	Health, Light.
55	Provident Financial plc	UK	Finance
56	Qantas Airways Ltd.	Australia	Airline
57	Repsol YPF Group	Mexico	Energy
58	RWE Energy	Germany	Nuclear Energy
59	SAB Miller plc	UK	Alcoholic Bev
60	SAP	Germany	IT
61	SCG	Thailand	Chem., Cem.
62	Shell PLC	Netherlands	Energy
63	Singapore Airlines	Singapore	Airline
64	Singtel Limited	Singapore	Telecom
65	Southwest Airlines	US	Airline
66	State Street Corp.	US	Finance
67	Sulzer	Switzerland	Engineering
68	Symantec Corporation	US	System Solu.
69	TE Connectivity Ltd.	Switzerland	Eng. & Tech.
70	Teck Resources Ltd.	Canada	Mining
71	Telstra	Australia	Telecom
72	Telus Corporation	Canada	Telecom
73	The Cooperative Group	UK	Co-operative
74	Toyota Motor Europe	Belgium	Automotive
75	Tullow Oil plc	UK	Oil & Gas
76	Verizone	US	Telecom
77	Virgin Australia	Australia	Airline
78	Virgin Atlantic	UK	Airline
79	Vodafone Group plc	UK	Telecom
80	Westpac Banking Corp.	Australia	Banking

APPENDIX C

INTERVIEW GUIDE QUESTIONS

1. What does sustainability mean to you? economic self-interest or ethical grounding i.e. moral importance of sustainable development)
2. What does value mean to you in terms of sustainability?
3. How sustainability policy is implemented in your organizations? What strategies are applied?
4. Do you think your company is offering leadership by responding to some of sustainability challenges?
5. What are the drivers/factors of your outgoing commitment?
6. Does your company report on sustainability? Are you in favor of Integrated reporting?
7. What level of external assurance do you currently obtain?
8. Are there pressures from stakeholders to report? How do you respond to stakeholder concerns?
9. How you get most value out of reporting. Is there a business case in terms of tackling sustainability challenges for your company?
10. If you had a great set of financial results, what does that mean in the context of your commitment to sustainable development?
11. Have you been able to measure performance in dealing with some of the environmental challenges for example; energy, water, emission issues?
12. How do you perceive material sustainable issues and what level of externalities are accounted and measured for?
13. Are you in favors of binding targets and mandatory reporting through international agreements?

14. Do you think the corporate sector has a role to play in pushing for these agreements and how corporate sector can contribute in shaping such agreements?

15. What is your perception on value creation and integration (TBL)? Do you see corporate heading in right path?

16. What are the sustainability trends and challenges facing business and wider society in the twenty-first century?

APPENDIX D

CONFERENCE ATTENDED

CSR Asia Summit

Beijing, 18-19 September 2012

Theme - Local Innovation for Global Challenges

Delhi Sustainable Development Summit/ World Sustainable Development Forum

New Delhi, 31 January - 2 February, 2013

Theme -The Global Challenge of Resource-Efficient Growth and Development

Global Conference on Sustainability and Reporting/Global Reporting Initiative (GRI)

Amsterdam, 22-24 May 2013

Theme - Innovation and Change: for a Sustainable Global Economy

APPENDIX E

RAW DATA

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
Amgen US 07-12	Pharmaceuticals	GRI 3	Conserve 500000 GJ	Conserve 235000 m3	Reduce 75000 metric ton CO2	700 metric ton	Recycle 40 %
Arcelor Mittal Luxembourg 08-10	Mining	GRI 3/UNGC 14001	2010-18.5 2009 -19 2008-17.8 GJ per ton of steel	2010-2.8 billion m3/Water Steering Committee	2010 -199 2009 164 2008-224 million ton		Recycle 25 million ton steel annually
Arcelor Mittal Luxembourg 08-10	Mining	GRI 3/UNGC 14001	2010-18.5 2009 -19 2008-17.8 GJ per ton of steel	2010-2.8 billion m3/Water Steering Committee	2010 -199 2009 164 2008-224 million ton		Recycle 25 million ton steel annually
Bacardi Ltd Bermuda 06-11	Alcohlic Beverages	GRI/UNGC 14001 18001	1366 GJ/16% renewable	4% reduction in 2011 (50% reduction since 2006)	2011-98000 metric ton (5600 metric ton/7% reduction year on year) 37% reduction since 2006	2011-133320 ton (12.6 percent reduction) 2010-152528 ton	Recycled packaging/2000 trees donated to Million Trees Project in China
Barclays UK	Banking/carbon Trade facilitator	GRI			2010 -1103000 2009- 1098000 2008-812000 ton		
Barclays UK	Banking/carbon Trade facilitator	GRI			2010 -1103000 2009- 1098000 2008-812000 ton		
Bayer Germany 06-10	Health Care	GRI /UNGC	2010 -85.7 2009- 77.3 2008-82.8 2007-85.3 2006-80.5 Petajoules (Pj)	2010-474 2009-407 2008-439 2007-447 2006-442 million m3 Water consumption rose year-on-year by 16.5 percent.	2010-8.50 2009-8.10 2008-8.66 2007-9.30 2006-9.38 million metric ton Co2 Reduce greenhouse gas emissions in the Group by 35% between 2005 and 2020	2010-807 2009-914 2008-1077 2007-928 2006-649 1000 metric ton Reduce hazardous waste from production to 2.5% in relation to manufactured sales volume	Not significant recycling due to bio hazard waste. Almost all waste is disposed.

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
Bell Canada	Communications	GRI/UNGC			Greenhouse gas (GHG) emissions in 2010 were 239 kilotonnes of CO2 equivalent, a reduction of 5% from 2009 and 22% from 2003	(tonnes) 2010 2009 2008 Recovered* 6,799 5,301 5,071 Waste to landfill 769 790 817 Total collected 7,568 6,091 5,888 Recovery rate* (%) 89.8% 87.0% 86.1%	Supports WWF Canada
Boeing US 07-10	Aviation	CDP (Carbon Disclosure Project)	2010-12.24 2009-12.64 2008-12.68 2007-12.95 MMBTU	2010-1.63 2009-1.71 2008-1.81 2007-1.83 billion US Gallon	2010-1.25 2009-1.29 2008-1.30 2007-1.33 million metric ton	2010-6.94 2009-8.15 2008-7.71 2007-8.99 thousand US ton	2010-73% 2009-68% 2008-64% 2007-58% Solid waste diverted from landfills
Cemex Mexico 08-10	Cement, Aggregates Ready mix concrete	GRI			2010-41.0 2009-39.7 2008-48.2 million metric ton 20.5% reduction in net Co2 specific emissions vs. 1990 baseline		543 sites were evaluated for their proximity to high biodiversity value areas
CDL (City Development Ltd) Singapore 07-10	Property Development/ Investment	GRI/UNGC/ISO26000/LEED	2010-71,408,788 2009-61,495,674 2008-65,421,737 2007-68,948,060 kWh	2010-0.14 2009-0.188 2008-0.161 2007-0.142 m3/month/m2	2010-34,221 2009-30,924 2008-34,367 2007-36,144 ton CO2	2010-46.5 2009-61.7 2008-59.87 2007-65.9 Construction Waste Generated at Work Sites kg/m2	2010-374,050 2009-320,233 2008-384,047 2007-417,074 Paper Recycled at CDL Buildings kg
Coca Cola Europe 06-10	Beverages	GRI/UNGC		2010-8.37 2009-8.66 2008-8.64 2007-8.79 2006-8.83 Billion liters (excluding Norway and Sweden)	2010-795,181 2009-830,802 2008-850,438 2007-795,760 metric tonnes CO2 e		2010-5,300 2009-4,782 2008-6,800 Packaging materials avoided (metric tons)

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
Cognizant Technilogy US 08-10	IT	GRI	Direct energy consumption – 100% from use of non–renewable diesel fuel 26,961 MWh/ Indirect energy consumption – 100% from purchase of non–renewable electricity 193,161 MWh		2010-222,205 2009-178,659 2008-182,538 metric tonnes CO2		
Constellation Energy US 08-10	Energy	GRI			2010- 17,530,579 metric tonnes CO2		2010-5,176 2009-4,490 2008-5,119 tons
Danisco Denmark 08-10	Food	GRI/DJSI	2010-2,527 2009-2,244 2008-2,692 GWh		2010-142,948 2009-127,574 2008-53,400 tonnes CO2	2010-92,563 2009-79,646 2008-105,727 tons	
EDC Canada 08-10	Export Development	GRI	2010-14,053,089 2009-14,018,225 2008-12,955,600 kWh	2010-24,296,804 2009-23,956,200 2008-23,852,000 litres	2010-5,296 2009-5,396 2008-5,149 tonnes CO2		2010-81 2009-25 2008-27 tons
Exxon Mobil US 08-11	Petroleum	GRI			2011-129 2010-125 2009-124 2008-126 million tones CO2		100% of 115 major operating sites were screened for water and biodiversity sensitivity
Freeport McMoran 07-10	Mining	GRI	2010-88 2009-84 2008-90 2007-83 Petajoules (PJ)	2010-625 2009-615 2008-650 2007-590 Million m3 (cubic meter)	2010-10 2009-9 2008-11 2007-9 million tones CO2		Biodiversity inventories were completed for all active mining sites in 2010.

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
Fluor US	Engineering	GRI/UNGC					-1.8 million pounds of paper recycled -210 tons of iron and steel recycled
France Telecom	Telecom	GRI/ISO26000					
GE US	Technology, services & Finance	GRI					
Hess Corp US 08-10	Oil & Gas	GRI	2010-60000 2009-58000 2008-56000 thousand gigajoules	2010-10.8 2009-11 2008-8.8 Million cubic meter m3	2010-9.8 2009-9.9 2008-11 million ton CO2	2010-89342 2009-126629 2008-102892 Metric tons	2010-40000 metric ton waste recycle
HSBC 08-10	Banking	ISAE3000	2010-1789 2009-1812 2008-1884 gigawatt hours	2010-10.8 2009-11 2008-8.8 million cubic meter m3	2010-1,017,000 2009-991,000 2008-954,000 tons CO2	2010-66 2009-62 2008-81 kilotons	2010-41 2009-38 2008-41 Kilotons waste recycle
Hydro Quebec 07-10	Electricity generation	GRI/ISO14001	2010- 2009- 2008- 2007-	2010- 2009- 2008- 2007-	2010-212038 2009-369196 2008-228005 2007-238122 Atmospheric emissions of GHGs from thermal electricity generation (t CO2 eq.)	2010- 2009- 2008- 2007-	2010- 2009- 2008- 2007-
IATA	Aviation		2010- 2009- 2008- 2007-		2010-660 2009-628 Million tons CO2 Global aviation		-Improve fuel efficiency an average of 1.5% annually to 2020 -Cap net carbon emissions with carbon-neutral growth from 2020 -Achieve a 50% reduction in net CO2 emissions by 2050 compared with 2005

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
IBM 06-10	IT		2010-5.7 2009-5.4 2008-6.1 2007-3.8 2006-3.9 Energy Conservation As % of total electricity use 2010-11.2 2009-11.3 2008-8.6 2007-8.5 2006-7.3 Renewable Energy Procured As % of total electricity use	2010-2.8 2009-3.1 2008-4.6 2007-6.0 2006-7.0 Water Conservation (%)	2010--16.7 2009--5.7 2008--1.6 2007-+2.0 CO2 Emissions Reduction % reduction against the 2005 base year	2010--21.6 2009-+8.4 2008--10.9 2007--8.4 2006--8.1 Hazardous Waste Reduction (%)	2010-79 2009-76 2008-76 2007-78 2006-76 Nonhazardous Waste Recycling % recycled of total generated against an annual goal of 67% (in 2006) and 75% (2007-2010)
IDB (Inter-American Development Bank)	Banking/Finance		2011-17133 2010-21124 2009-21864 Electricity (MWh) 2011-28301 2010-27754 2009-27725 Gas (ccf)	2011-11638 2010-10732 2009-9906 Water (thousands of gallons)	2011-27821 2010-28036 2009-25370 CO2 emissions (tons CO2 eq)	2011-435 2010-516 2009-425 Waste generation (tons)	2011-395 2010-106 2009-178 Recycling—paper, cardboard, aluminum, plastics, and glass (tons)
Kellogg US 05-10	Food	GRI	2010-13.07 2009-13.00 2008-12.80 2007-12.57 2006-12.58 2005-12.26 million gigajoules	2010-12.53 2009-12.71 2008-13.12 2007-12.66 2006-12.82 2005-12.63 million cubic meter m3	2010-1.17 2009-1.15 2008-1.16 2007-1.15 2006-1.15 2005-1.12 million metric tons CO2	2010-19.13 2009-23.50 2008-30.65 2007-37.76 2006-38.74 2005-33.91 Thousand metic tons	reduced waste sent to landfill by 51 percent per metric tonne of food produced. Overall, more than 93 percent of the waste Kellogg generates is recycled, sent for energy recovery or used for animal feed.
Lafarge France	Cement/Concrete/ Aggregate	GRI/DJSI/SRI	total enegy consumption has	323.43 million cubic	2010-95 2009-95	463.88 thousand metric ton waste from operations	144.18 million cubic meter C3 water

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
05-10			not changed since 2009 11.0 MTOE (million metric tons of oil equivalent by business unit). 94% of energy consumption takes place in the Cement business.	meter m3	2008-105 2007-106 million metric tons CO2	85% Quarries with rehabilitation plans	returned to source
Land Securities UK 07-10	Real Estate		2011-277.98 2010-243.03 2009-204.92 2008-171.19 2007-179.87 Million kWh	2011-341473 2010-268901 2009-343593 cubic meter m3	Reduce average CO2 emissions from managed properties by 30% by 2020 against a 2000/01 baseline. (measured in total kg CO2 per sq m)	2011-23218 2010-22165 2009-25054 2008-21893 2007-16343 tons	70% waste reused or recycled from London managed office portfolio 6 shopping centres achieved zero waste to landfill
Loreal France	Cosmetics	UNGC	1% increase (2009–10); 1.2% decrease (2006–10)	6% reduction per unit of finished product	27% absolute reduction in CO2 emissions		7.4% reduction in waste generated (including returnable packaging), per unit of finished product 96.1% of waste is reused, recycled or recovered for energy More than 50% of industrial sites sent no waste to landfill
Marks & Spencer UK	Apparel/ Food/Lifestyle		2011		Reduced total carbon emission by over 90000 tons since 2007. 23% improvement (in store and warehouse energy efficiency.		Total waste down 34 % 94% 0f waste from stores, offices, warehouses were recycled.
Marathon Oil US 05-10	Oil	GRI/UNGC			2009-18.3 2008-18.7 2007-19 2006-19.2 2005-19.5 million metric tons CO2		

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
Merck 06-10	Pharmaceutical	GRI/UNGC	2010-1474 2009-1352 2008-1480 2007-1492 2006-1489 GWh	2010-17.6 2009-20.0 2008-21.1 2007-15.9 2006-17.9 Million cubic meter m3	2010-574 2009-505 2008-528 2007-611 2006-553 kt CO2e	2010-193 2009-162 2008-215 2007-189 2006-188 kt	2010-62% 2009-59% 2008- 2007- 2006- NH waste recycled
Motorola Us 05-10	Telecom		2010- 803 2009- 866 2008- 955 2007- 1,114 2006- 1,170 2005- 1,207 million kwh	2010-2331 2009-2308 2008-2699 2007-3027 2006-3172 2005-3534 thousand m3	2010-33,349 2009-33,217 2008-38,767 2007-39,094 2006-40,308 2005-39,442 tons CO2e	2010-454 2009-458 2008-509 2007-670 2006-223 2005-319 tons	2010-84 2009-75 2008-79 2007-80 2006-79 2005-79 NH waste recycled
NCB (National Commercial Bank) Saudi Arabia 07-10	Banking	GRI	2010-111819 2009-68092 (000 of kwh)	2010-203.4 2009-304.8 (000 of m3)	2010-157422 2009-55705 metric tons	2010-3058 2009- 2008-5602 2007-4550 metric tons	2010- more than 86,000 box-files had been emptied and refurbished – saving the cost of new box-files and yielding 46 tons of paper waste,
OXY US 06-10	Petroleum	HES Management System	2010-0.89 2009-0.86 2008-0.94 2007-0.95 2006-1.0 Base year 2006=1.0 (excludes energy used to generate electricity exported to the grid)		2010-17.8 2009-16.6 2008-16.7 2007-15.6 2006-15.3 Million metric tons CO2 equivalents	2010-41 2009-42 2008-56 2007-56 2006-66 thousand tons hazardous waste 2010-96 2009-51 2008-81 2007-63 2006-45 thousand tons non-hazardous waste	13 % reduction in energy use across the group based on 2008 levels
Provident Financial UK 04-10	Finance	GRI	2010-5410 2009-6331 2008-6677 2007-6627		2010-5236 2009-6236 2008-5279 2007-3095	2010-1488 2009-1791 2008-1217 2007-379	2010-1258 2009-1308 2008-1055 2007-147

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
			2006-5244 2005-3844 2004-3572 energy consumption (MWh) + branch offices 2010-6725 2009-8572 2008-7309 (MWh) 13 %reduction in energy use across the group based on 2008 level		2006-5244 2005-3844 2004-3572 CO2 emissions associated with energy consumption (tonnes)	2006-261 2005-262 2004-263 absolute waste production (tones) *04-07 is only head office (excluding branch offices) data.	2006-148 2005-109 2004-117 absolute waste recycled (tones)
Repsol Mexico 06-10	Energy	DJSI	2010-298.65 2009-312.78 2008-322.56 2007-344.53 2006-324.49 total energy consumption (million GJ)	2010-115,805 2009-115,266 2008-118,815 2007-125167 2006-124320 external water withdrawal (thousands of tons)	2010-23.38 2009-24.11 2008-25.87 2007-26.77 2006-26.38 direct emissions of CO2 equivalent (millions of tons)	2010-195774 2009-152937 2008-188065 2007-202833 2006-198038 metric tons hazardous waste 2010-403882 2009-218738 2008-381813 2007-498236 2006-496128 metric tons non-hazardous waste	2010- 35% hazardous waste reused 3% non-hazardous waste reused
RWE Technology Germany 07-11	Energy (Electricity & Gas)	GRI/UNGC	2010-403.0 2009-368.2 2008-396.0 2007-411.7 billion kWh	2010-1.41 2009-1.70 2008-1.49 2007-1.69 m3/MWh	2010-472.8 2009-434.5 2008-479.6 2007-509.0 million mt	2010-485 2009-584 2008-347 2007-654 metric tons nuclear waste from power stations	2010- 2009- 2008- 2007-
SAB Miller UK 07-11	Alcohlic Beverages	GRI/UNGC	2011-24 2010-23 2009-24 2008-26	2011-731 2010-722 2009-759 2008-793	2011- 2010- 2009- 2008-	2011-3.1 2010-2.8 2009-3.0 2008-.3.3	2011-3.0 2010-2.7 2009-2.8 2008-3.1

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
			2007-25 Total energy consumption (TJ)	2007-762 total water consumption (million hl water)	2007- total CO2 e emissions from fossil fuel energy used on site (million tonnes)	2007-2.8 Waste produced (million tonnes)	2007-2.7 Waste recycled or reused (million tonnes)
SCG TH 07-11	Chemical/Building Material /Paper/Cement/Distribution	GRI/DJSI/UNGC	2011-167.68 2010-140.68 2009-135.49 2008-135.50 2007-136.84 Total Energy Consumption (Petajoules)	2011-104.55 2010-95.50 2009-91.89 2008-78.20 2007-79.02 (Million Cubic Meters)	2011-23.0 2010-21.75 2009-20.78 2008-20.10 2007-19.75 (Million Tons)	2011-12.21 2010-17.02 2009-13.44 2008-14.32 2007-23.27 hazardous waste (thousand tons) 2011-1305.30 2010-1176.12 2009-653.60 2008-749.38 2007-758.23 non-hazardous waste (thousand tons)	2011-9.0 2010-9.99 2009-10.78 2008-10.54 2007-11.72 Proportion of Recycle Water (%)
*** Shell PLC Netherlands 02-11	Energy & Petrochemicals 01	GRI/UNGC/CDP		2011-209 2010-202 2009-198 2008-224 2007-235 Millionm3	2011-74 2010-76 2009-79 2008-65 2007-82 2006-88 2005-93 2004-101 2003-102 2002-96 (Million Tons)	2011-2477 2010-2000 2009-2101 2008-1684 2007-2806 2006-1870 2005-1263 2004-1135 2003-1118 2002-1261 (thousand tons)	
State Street US 07-10	Financial Services 07	GRI/DJSI	2010-97052 2009-106170 2008-80891 2007-81782 MMBTU	2010-0.389565 2009-0.350677 2008-0.338952 2007-0.313023 Million m3			
TE Connectivity Switzerland 09-11	Engineering &Technology 03	GRI/CDP	2011-5.72 2010-6.05 2009-6.22 Million GJ	2011-4.62 2010-4.76 2009-4.59 Million m3	2011-0.72 2010-0.77 2009-0.77 Million ton	2011-4691 2010-7252 2009-5293 Hazardous waste tons	2011-64294 2010-69206 2009-55187 Metric tons
TECK Canada 06-10	Mining 02	GRI	2010-43.62 2009-38.06	2010-125 2009-119	2010-2.97 2009-2.61	2010-639458000 2009-616799000	2010-90 2009-99

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
			2008-43.72 2007-36.97 2006-35.93 Million GJ	2008-131 2007-125 2006-123 Million m3	2008-3.03 2007-2.56 2006-2.28 Million ton	2008-668841000 2007-520848000 2006-516333000 tons	2008-94 2007-107 2006-100 Water recycled %
TELUS Canada 06-10	Telecommunications 09	GRI/UNGC	2011-4.07 2010-4.05 2009-3.90 2008-3.65 Million GJ		2011-0.37 2010-0.36 2009-0.35 2008-0.33 Million ton		
Tullow Oil UK 08-11	Oil & Gas 01	GRI		2010-0.107423 2009-0.071683 2008-0.062380 Million m3	2010-0.26 2009-0.08 2008-0.19 Million ton		
Verizone US	Telecommunications 09	GHGP/DJSI/EPA			2010-6.062598 Million ton		
Vodafone UK 07-11	Telecommunications 09	GRI	2011-14.82 2010-11.80 2009-10.95 Million GJ		2011-2.29 2010-1.54 2009-1.53 2008-1.54 2007-1.33 Million ton	2011-7473 2010-5870 2009-4944 tons	2011-99 2010-98 2009-97 Network equipment recycling
Nexen Canada 10-11	Oil & Gas 01	GRI		2011-4.11 2010-3.46 Million m3	2011-5.82 2010-6.34 2009-4.72 Million ton		
The Cooperative UK 06-11	Cooperative 05		2011-4.56 2010-5.11 2009-5.83 2008-6.59 2007-2006-7.18 Million GJ	2011-2.6 2010-2.8 2009-2.8 2008-2.9 Million m3	2011-0.84 2010-0.94 2009-1.09 2008-1.28 2007-2006-1.41 Million ton	2011-114343 2010-119665 2009-124268 2008-119665 2007-2006-161263 tons	2011-61.19 2010-60.36 2009-58.20 2008-59.12 2007-2006-56.60 Recycling%
CapitaLand Singapore 08-11	Real Estate Development 03	GRI	2011-2.58 2010-2.43 2009-2.05 2008-1.94 Million GJ	2011-7.9 2010-6.9 2009-6.0 2008-5.8 Million m3	2011-0.44 2010-0.40 2009-0.33 2008-0.31 Million ton		
CSL Plasma Australia	Biotechnology 06		2012-1.79 2011-1.73	2012-2.02 2011-1.95	2012-0.15 2011-0.14	2012-15004 2011-13789	2012-73 2011-70

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
10-12			2010-1.77	2010-1.89	2010-0.14	2010-13979	2010-69
			Million GJ	Million m3	Million ton	ton	Recycling%
SAP	IT	GRI	2012-3.09		2012-0.43		
Germany	08		2011-3.09		2011-0.44		
11-12			Million GJ		Million ton		
Bombardier	Aircraft, Trains	GRI/UNGC	2011-4.58	2011-2.16	2011-0.31	2011-55310	2011-
Canada	03		2010-4.64	2010-2.13	2010-0.32	2010-49580	2010-
07-11			2009-5.00	2009-2.30	2009-0.36	2009-24400	2009-
			2008-5.36	2008-2.30	2008-0.41	2008-28180	2008-
			2007-4.99	2007-2.28	2007-0.38	2007-28610	2007-
			Million GJ	Million m3	Million ton	ton	
Westpac	Banking &	GRI	2012-0.95	2012-0.50	2012-0.18	2012-3081	
Australia	Finance		2011-0.96	2011-0.80	2011-0.18	2011-2409	
08-12	07		Million GJ	2010-0.64	2010-0.20	2010-1814	
				2009-0.36	2009-0.20	2009-1484	
				2008-0.37	2008-0.19	2008-1190	
				Million m3	Million ton	ton	
Toyota Europe	Aotomotive		2012-2.80	2012-0.96	2012-0.22	2012-10624	2011-88
Belgium	04		2011-2.86	2011-0.96	2011-0.23	2011-10078	2010-89
08-12			2010-2.82	2010-1.03	2010-0.22	2010-11038	2009-87
			2009-3.17	2009-1.24	2009-0.26	2009-15061	2008-84
			2008-3.97	2008-1.60	2008-0.33	2008-23772	Recycling % packaging
			Million GJ	Million m3	Million ton	ton	+pallets
Microsoft US	Software	GRI/UNGC			2011-1.53		
09-12	08				2010-1.50		
					2009-1.29		
					Million ton		
Telstra	Telecommunicatio				2012-1.67		2012-99
Australia	n				2011-1.65		Recycling % (e waste)
10-12	09				2010-1.69		
					Million ton		
Noble Energy	Oil & Gas	GRI			2011-2.13		
09-11	01				2010-2.60		
					2009-2.47		
					Million ton		
Credit Suisse	Banking &	UNGC	2012-2.37	2012-1.44	2012-0.38	2012-12502	
Switzerland	Finance		2011-2.55	2011-1.33	2011-0.37	2011-14121	
10-12	07		Million GJ	Million m3	2010-0.36	ton	
					Million ton		
Henkel	Home Care	GRI/UNGC/	2012-7.90	2012-7.73	2012-.065	2012-138000	2012-57.24

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
Germany 08-12	Products 05	DJSI	2011-7.99 2010-8.78 2009-8.85 2008-11.47 Million GJ	2011-7.92 2010-8.68 2009-9.17 2008-12.04 Million m3	2011-0.65 2010-0.71 2009-0.71 2008-0.93 Million ton	2011-145000 2010-155000 2009-165000 2008-174000 ton	2011-61.37 2010-58.70 2009-64.84 2008-59.19 Recycling %
Philips, Netherlands 08-12	Healthcare, Lifestyle, Lighting 08	GRI/ISO14001	2012-14.42 2011-13.98 2010-14.42 2009-14.42 2008-14.52 Million GJ		20120.69 2011-0.63 2010-0.67 2009-0.81 2008-0.82 Million ton	2012 2011- 2010- 2009- 2008-	
Symantec US 11-12	System management Solution 08	GRI/UNGC	2012-1.51 2011-1.70 Million GJ		2012-0.18 2011-0.19 Million ton		2012-94 2011-93 Recycling %
Kinross Gold Canada 07-11	Mining 02	GRI/UNGC/ISO14001		2011-52.24 2010-38.48 Million m3	2011-1.22 2010-0.95 2009-0.86 2008-0.68 2007-0.54 Million ton		
BP UK 08-12	Oil & Gas 01	GRI			2012-56.4 2011-57.7 2010-60.2 2009-60.4 2008-57.0 Million ton Customer emission 2012-517 2011-539 2010-573 2009-554 2008-530 Million ton		
Singtel Singapore	Telecommunications 09	GRI	2012-1.24 2011-1.22 2010-1.24 2009-1.23 Million GJ	2012-0.78 2011-0.78 2010-0.75 2009-0.73 2008-0.79	2012-0.189 2011-0.186 2010-0.187 2009-0.180 Million ton	2012-4292 2011-4429 2010-4467 2009-4520 ton	

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
				Million m3			
Singapore	Airlines	ISO14001	2012-0.21	2012-0.22	2012-13.20	2012-6059	2012-20.25
Airlines	03		2011-0.21	2011-0.25	2011-12.80	2011-6053	2011-20.83
08-12			2010-0.20	2010-0.27	2010-12.00	2010-5490	2010-18.16
			Million GJ	Million m3	2009-13.80	ton	Recycling %
					2008-14.00		
					Million ton		
Qantas	Airlines	GRI/DJSI	2012-0.82	2012-0.97	2012-12.49	2012-24306	
Australia	03		2011-0.83	2011-0.97	2011-12.27	2011-25149	
08-12			2010-0.84	2010-1.00	2010-11.70	2010-28102	
			2009-0.87	2009-1.04	2009-12.02	2009-29838	
			2008-0.90	2008-1.14	2008-12.42	2008-30756	
			Million GJ	Million m3	Million ton	Metric ton	
Emirates	Airlines		2011-2.20	2011-0.0052	2011-18.40	2011-100984	
UAE	03		Million GJ	Million m3	Million ton	ton	
Virgin	Airline		2012-0.11		2012-4.62	2011-741	2011-68
Atlantic	03		2011-0.13		2011-4.51	2010-692	2010-53
UK			2010-0.13		2010-4.80	2009-706	2009-43
08-18			2009-0.13		2009-5.23	2008-1040	2008-40
			Million GJ		2008-5.21	ton	Recycling %
					Million ton		
Cathey Pacific	Airlines			2011-0.84	2011-15.85		
HK	03			2010-0.83	2010-15.17		
06-11				Million m3	2009-13.85		
					2008-14.39		
				Seawater	2007-13.76		
				consumption	2006-11.32		
				2011-7.57	Million ton		
				2010-7.54			
				Million m3			
Air France-	Airlines	GRI/UNGC	2011-3.42	2011-0.88	2011-0.084	2011-65964	2011-45
KLM	03		2010-3.19	2010-0.95	2010-0.092	2010-64670	2010-47
Netherlands			2009-2.69	2009-0.97	2009-0.089	2009-67028	2009-45
09-11			Million GJ	Million m3	Million ton	tons	Recycling %
LAN Chile	Arlines	GRI	2011-29.44	2010-156.95		2011-2587	
10-11	03		2010-33.39	2009-158.04		2010-2612	
			MWh (negligible)	M3 (negligible)		tons	
Asiana	Airlines	GRI/ISO14001	2009-0.0896	-	2009-4.68		
Airlines	03		2008-0.1135		2008-4.80		
Korea			2007-0.1130		2007-4.49		
06-11			Million GJ		2006-4.29		
					Million ton		

Company	Sector	Framework	Energy Intensity	Water Intensity	Emissions CO2	Effluent & Waste	Recycling
Virgin Australia 10-11	Airlines 03	GRI/CDP	2011-42.82 2010-38.63 Million GJ		2011-2.99 2010-2.69 Million ton	2011-1960 2010-2062 tons	
Southwest Airlines 09-12	Airlines 03	GRI	2012-257.65 2011-246.12 Million GJ	2012-0.29 2011-0.29 2010-0.27 Million m3	2012-18.3 2011-17.5 2010-14.0 2009-13.9 Million ton	2012-3554 2011-3227 2010-3166 2009-1513 tons	
Adidas Germany	Sports 04						
BAE UK	Aerospace 03	GRI					
Sulzer Switzerland 08-12	Emgineering 03	GRI	2012-1.25 2011-1.16 2010-1.11 2009-1.00 2008-1.10 Million GJ	2012-2.15 2011-2.40 2010-2.25 2009-1.55 2008-1.54 Million m3	2012-0.13 2011-0.11 2010-0.11 2009-0.10 2008-0.10 Million ton	2012-34110 2011-40170 2010-32150 2009-32130 2008-36110 tons	

BIOGRAPHY

NAME	Mr. Karun Kumar
ACADEMIC BACKGROUND	Bachelor of Arts (Hons.) University of Delhi, India Master of Arts University of Delhi, India Post Graduate Diploma in Business Administration (PGDBA) Board of Technical Education Lucknow, India. Certified in Business Management Practices, Australian Institute of Management
PRESENT POSITION	Associate Consultant, Business Development Techso Pty Ltd, Brisbane, Australia
EXPERIENCE	Over 21 years in Consulting, Information Dissemination, and Business Development, working in a number of countries and also for International Organizations.
AWARD	Business Professional (ASCO Code 2799-99), recognized by the Dept. of Employment, Education and Training (DEET) Australia.
CONTACT	Email: karun.k@iimetro.com.au star1@iimetro.com.au