ENVIRONMENTAL MANAGEMENT SYSTEM FRAMEWORKS IN OIL & GAS INDUSTRIES

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A DISSERTATION REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR

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DISSERTATION

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I hope with all your best wishes and blessings I deliver my best to any responsibility assigned. I would like to thank you from bottom of my heart.

CERTIFICATE

This is to certify that the dissertation report on "ENVIRONMENTAL MANAGEMENT SYSTEM FRAMEWORKS IN OIL & GAS INDUSTRIES" completed and submitted by RAJESH PATNAIK in partial fulfillment of the requirements for the award of degree of Masters of Business Administration (Oil and Gas Management), is a bonafide work carried out by him under my supervision and guidance.
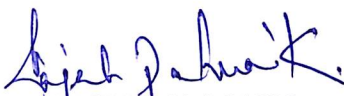
To the best of my knowledge and belief the work has been based on investigation made, data collected and analyzed by him and this work has not been submitted anywhere else for any other University or Institution for the award of any degree/diploma.

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DECLARATION

This dissertation report is entirely my own work. It has not been submitted in any previous application for a degree. All quotations in the report have been distinguished by quotation marks, and the sources of information specifically acknowledged.

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ABSTRACT

This paper addresses the Environmental Management System (EMS) frameworks among the twenty-five biggest oil companies in the world. An Environmental Management System is a framework which can be used by companies to structurally control and manage their environmental aspects and impacts. Specifically, in this study, focus is put on the content and structural set-up of EMS frameworks. The study looks at the current design and set-up of EMS frameworks and further builds upon a previous study to look at the development over time in order to imply future directions of EMS framework set-up and design. A wide case study approach was taken in order to gather the required data necessary to generate representative figures and results. Company websites, reports and articles were the main sources of data. A comparative analysis was conducted where data from an earlier study was compared to the findings of this study in order to visualize changes over time and predict trends. Some really interesting results emerged from the analysis. The EMS standard „ISO 14001" is by far the most used, but certification on corporate level is sparse. However, it is much more common that subsidiaries and specific operations are certified. Also, about half of the companies disclose their environmental policy, and eighty percent of the companies do not disclose environmental targets. Further, results indicate that Codes of Conduct are being more frequently referenced in the environmental reports but however; that environmental policies are being more frequently excluded from the same. There are also indications pointing towards higher priority of environmental reports when it comes to the size of scope and number of pages. The study concludes that EMS is widely adopted in the oil industry and that there is an emergence of four distinct sets of integrated management system structure components.

EXECUTIVE SUMMARY

This study provides an analysis of the current trends in Environmental Management System (EMS) framework structure, design and setup as well as insight to current practices among the world's twenty-five biggest oil companies. Historical findings were compared to current findings in order to predict the direction of the trends in relation to EMS design and setup. Further, a solid foundation of structural information on the current EMS practices was generated and analyzed in order to establish proportionate figures and results. All findings can be found in the appendix.

The research draws attention to the fact that 92 percent of the investigated companies make a reference to EMS, indicating a high level of use within the industry. Further, the most commonly used EMS standard is ISO 14001 which is referenced by 72 percent of all companies. An important notification is however that the level of corporate ISO 14001 certification is low. The study on the other hand reveals that it is much more common that company subsidiaries and specific operations are certified. Also, over half of the companies tailor the design of their EMS to be compatible with standards.

When looking at strategic documents 64 percent of the companies disclosed these. In the strategic documents reference was found for "aim for legal compliance" among 24 percent of the companies, while 16 percent referenced "aim for best practice". Another important finding was that no company referenced delegation of responsibility within their strategies. The environmental policy, an important component of an ISO 14001 certified EMS, was disclosed by just over half of the companies. Delegation of responsibilities was found referenced within the policy by merely 20 percent of the companies. Ultimately, only 20 percent of the companies reference environmental targets.

The most evident trends found in the study are:

i) Companies seem to move towards integrated management systems (Health, Safety and Environment) and that these are becoming increasingly more complex due to further inclusion of i.e. quality and security management.

ii) Companies are moving from single issue reports (environmental reports) to more comprehensive reports (Environment, Economy, Social and Governance reports)

iii) Frequency of including the Code of Conduct in the environmental report is rising, while the environmental policies are more frequently being left out.

The author concludes that EMS is being used to a large extent in the oil industry and that four main structural sets of design of the predominant "integrated management system" emerges. The author recommends that it would be valuable to further research how these different structural sets are integrated and managed within the same management system.

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ABBREVIATIONS (IF REQUIRED)

ACC – American Chemistry Council

API – American Petroleum Institute

APPEA – Australian Petroleum Production and Exploration Association

ARPEL – Natural Gas Companies in Latin America and the Caribbean

BSI – British Standards Institution

EHS – Environmental Health and Safety

EMAS – Eco-Management and Audit Scheme

EMS – Environmental Management System

GEMI – Global Environmental Management Initiative

HSE (MS) – Health, Safety and Environment (Management System)

IPIECA – Global Oil and Gas Industry Association for environmental and Social issues

ISO – International Standardization Organization

NGO – Non-Governmental Organization

OGP – Association of Oil and Gas Producers

PDVSA – Petróleo de Venezuela (Oil company)

TQEM – Total Quality Environmental Management

1. Introduction

Today, the world is heavily dependent and reliant on fossil energy (oil, gas and other types of fossil energy) with little sight of this decreasing in the near future. The International Energy Agency (IEA) predicts that in 2035 the crude oil demand will increase to 99.7 million barrels a day from 2011 where it was 87.4 million barrels per day (IEA, 2012). The production and exploitation of oil can have a very damaging impact on the environment and some of the different externalities that can be produced as a consequence are environmental degrading, deforestation, eco-system destruction, harm to animal populations, loss of biodiversity, air pollution (such as release of carbon monoxide and nitrogen oxides), greenhouse gas emissions, acid rain, land and water pollution through chemical contamination, and more solid and liquid waste than all other activities (municipal, industrial, mining and agricultural) combined within the USA. Furthermore, it contributes to the impact of larger environmental problems such as climate change (Dara O"Rourke & Sarah Connolly, n.d.).

Thus, while the extraction and production of oil is necessary, the wide health and safety issues that it presents through the environmental degradation is of major concern worldwide as it can pose a serious threat to the human and natures well-being. As it is predicted that oil production will only increase and that our dependency on oil will remain in the near future, there is a need to manage, minimize and eliminate wherever possible the environmental degradation in order to ensure health and safety for generations to come. An Environmental Management System (EMS) is a tool that companies can incorporate to manage their environmental issues and improve their environmental performance and can be seen as a possible key contributer to mitigating the potential environmental risks related to the oil industry.

1.1 Background

1.1.1 The development of EMS in the framework of environmental management

Environmental management was considered to be a part of resource management and it did not become accepted as issue in its own right until the 1960s. This led to a more systematic approach that resulted in environmental management systems; however, the term Environmental Management System was not recognized until the early 1990's with the development of formal standards (Dixon Thompson, 2002).

The first management system quality standard was published by the British Standards Institution (BSI) in 1979 the BS 5750 (British Standards Institution, 2013). In 1984, the Chemical Producers Association of Canada introduced an environmental initiative called Responsible Care. This was the first unofficial environmental management system standard (Moffet, Bregha, & Middelkoop). The first official environmental management system standard was the BS 7750 published by the BSI in 1992. 5 Within the same year (1992) The Global Environmental Management Initiative developed the Total Quality Environmental Management systems approach (British Standards Institution, 2013; Global Environmental Management Initiative (GEMI), 1993a, 1993a; International Institute for Sustainable Development - Business and Sustainable Development: A Global Guide, n.d.). In 1993, the European Community (today, European Union) first introduced the Eco-Management and Audit Scheme (EU EMAS Regulation 1836/93) (Andrews, 2001). Next year, in 1994, the Canadian Standards Association produced a Canadian standard z750 for environmental management systems. Ultimately in 1996 the International Standards Organization published an international environmental management system standard "ISO 14001 (Dixon Thompson, 2002)."

This indicates that the development of environmental management systems is quite active and relatively recent. In addition, in 2012, more than 270,000 organizations all over the world where certified according to ISO 14001. ISO 14001 was updated in 2004 and a third version of the standard is planned for in early 2015 (Briggs, 2012).

1.1.2 EMS: Definition, Purpose & Structure

There are numerous different EMS definitions:

The British Standards Institute defined environmental management systems to be "the organizational structure, responsibilities, practices, procedures, processes and resources for determining and implementing environmental policy (Kirkland, 1997; Netherwood, Alan & Welford, 1996)".

The Canadian Standards Association defined EMS as "the design of an environmental management system is ongoing, interactive planning process that consists of defining, documenting, and continuously improving the required capabilities, namely: resources, training, information systems, operational process and procedures, documentation, measurement and monitoring criteria (Dixon Thompson, 2002)."

The International Standardization Organization defines environmental management system as "the part of the overall system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy"(Wateringen, 2005). ISO 14001:2004 defines it as "part of an organizations management system used to develop and implement its environmental policy and manage its environmental aspects."A management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives." „A management system includes organizational structure, planning, activities, responsibilities, practices, procedures, processes and resources (Brady, 2004; Kørnøv, Remmen, Lund, & Thrane, 2007; Wateringen, 2005)."

Kirkland and Thompson define EMS to be "an integral part of an organizations overall management system that is designed to improve environmental performance by setting goals and objectives (policy); identifying, obtaining, and organizing the people, skills, and knowledge, technology, finances and other resources necessary to achieve the goals and objectives; identifying and assessing options for reaching the goals; assessing risks and priorities; implementing the selected set of options; auditing performance for necessary adjustments by providing feedback to the system; and applying the environmental management tools as required (D. Thompson & Kirkland, 2002)."

EMS systems follow the Denning model of quality management, with a four-phase cycle of plan-do-check-act that results in continuous improvement (Wateringen, 2005). Planning refers to identifying the environmental aspects and impacts that are significant within the company in order to establish an environmental policy in addition to environmental objectives, targets and action plans to be able to achieve their environmental policy. Doing is the implementation and documentation of these plans, procedures and processes. Checking is to monitor, measure and acquire feedback through regular audits. Acting is management review, to continually review EMS functionality and performance this within ISO 14001 is carried out by senior management/upper level management (Kørnøv et al., 2007; D. Thompson & Kirkland, 2002).

Thompson (1995) considers the EMS cycle to include the following key EMS elements:

- Strategic Framework
- Goals and Objectives
- Setting Priorities

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- Implementing Options
- Evaluation (Kirkland, 1997)

According to Thompson and Kirkland EMS are thorough, set up in a preventive systematic manner systematic, acting in a preventive manner, have corporate commitment, are set up to ensure monitoring, review and continual improvement through employee involvement (D. Thompson & Kirkland, 2002).

Furthermore, Thompson and Kirkland's define the following factors important for a successful EMS system: upper/senior level commitment, ems integrated into the business plan, upper level management establishes or approves goals and objects, monitoring, evaluate and review with apt revisions, and continuous improvement (D. Thompson & Kirkland, 2002).

EMS systems provide a structured framework for companies to identify, evaluate, manage and improve their environmental, performance (Brady, 2004). It aids companies in establishing their environmental policies, establishing the objectives, targets and programs to achieve their policies, and in implementation throughout the company (operations, employees, contractors and suppliers). Places measurements, monitoring procedures, auditing of environmental performance, and an evaluation of the system procedure (Brady, 2004). This assistances companies to manage their risks, comply with regulatory requirements and international standards and anticipate new ones (in order to adapt to them with a larger timeframe), reduce unnecessarily costs by becoming more efficient (e.g. Resource efficient, energy efficient or water efficient), facilitate with financing, improve company reputation and image (building brand-confidence), meeting market demands (including that of stakeholders, associates and consumers), stay up to date with current trends and facilitate communication with stakeholders (D. Thompson & Kirkland, 2002).

1.1.3 EMS standards

The Global Environmental Management Initiative (GEMI) was formed in 1990 by originally a group of 21 companies with the aim of sharing best practices for environmental, health and safety, in order to create strategies and standards for improving their environmental performance (Global Environmental Management Initiative (GEMI), n.d.-a; International Institute for Sustainable Development - Business and Sustainable Development: A Global Guide, n.d.). In 1992 GEMI had increased a group of 23 companies that introduced total quality environmental Management (TQEM) approach (Friedman, 2003; Global Environmental Management Initiative (GEMI), n.d.-b). This approach aimed to integrate environmental management with total quality management, thereby continuously improving company's product, process and service (Friedman, 2003; Global Environmental Management Initiative (GEMI), 1993b). The TQEM published Total Quality Environmental Management the primer in 1993, as a guideline and reference on how to use TQEM. The guidelines have four main parts:

i)   introduction,
ii)   TQEM defined
iii)   implementing a TQEM program
iv)   measurements and how to use them.

TQEM have four basic elements to it:

i)   "identify your customers." – the customer defined and set the standard for quality.

ii)   "Continuous improvement." – a systematic, continuous improvement approach to conducting and managing business processes.

iii)   "Do the job right the first time." –a preventive approach to business, focusing not solving the symptoms but preventing the problems from occurring in the first place.

iv)   Take a systems approach to work. – To look at each component of environmental management as a system (Global Environmental Management Initiative (GEMI), 1993a, 1993b).

Currently, two of the companies ConocoPhillips and ENI that are being looked at in this study are members of GEMI (Global Environmental Management Initiative (GEMI), n.d.-b).

EMAS Regulation 1836/93 first introduced in 1993, first revision Regulation (EC) No 761/2001 (EMAS II) was adopted in 2001, in 2009 the second revision Regulation (EC) No 1221/2009 ("EMAS III") was published EU regulation for ECO-Management and Audit Scheme (EMAS) second revision 2005 EMAS requires companies to make environmental policies that commit to relevant environmental legislation and continuous improvement, perform an environmental review, establish an environmental program (that includes measurable objectives and indicators (in order to measure progress)) (Brorson & Larsson, 2006; European Commission, n.d.; Dixon Thompson, 2002). In addition, environmental audits have to be conducted minimum every three years (but depends on environmental verifier and size of company), audits have to be conducted by independent accredited verifiers, environmental statement should be published (including current performance, how it is meeting its current targets, and what the future targets), companies must send environmental statements to the registration body (however, the obligation of communicating these statements to the public is up to the companies themselves)(Brady, 2004; European Commission, n.d.; Kørnøv et al., 2007).

As mentioned previously, the first official environmental management system standard was published by British Standard Institute BS 7750 "Specification for Environmental Management Systems" (Kørnøv et al., 2007). In order to ensure its success, the first year was used as a trail test period in four different industry sectors. In 1994 revisions were made and generalized standard was published (Edwards, 2003). Critics say that due to the standard not providing any necessity of disclosure, it provides the opportunity for companies to achieve the standard but only making promises for improvement (Barrow, 2006). However, in 1996 BS7750 was replaced by ISO 14001 in 1996 by the British standard organization (Zobel, 2005).

In addition, the 1994 Canadian Standards Association produced CSA z7501 was also replaced by ISO 14001(Dixon Thompson, 2002). ISO 14001 was first published in 1996, first revision 2005, second revision currently ongoing (Briggs, 2012; British Standards Institution, 2013).

As an international standard it is set up to be applicable to all industries worldwide (D. Thompson & Kirkland, 2002). Companies are expected to publish their environmental policy, comply with regulations, manage environmental aspects, goals, and implement continuous environmental improvement. However, the speficity and interpretation of these improvements are up to the individual companies (Kørnøv et al., 2007).

ISO 14001 has five main components: Environmental Policy, Planning, Implementation and operation, checking and management review. ISO 14001 does not set specific performance requirements or requirements on how company requirements should be met, rather it is a framework standard for the process or manner of approaching environmental management (Kørnøv et al., 2007). Therefore, according to Remmen, the certification does not in itself reveal much about the company environmental performance.

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Also, according to Kolk some argue that ISO is flexible, while others see this as a weakness (Kolk, 2004; Wateringen, 2005).

The main differences between EMAS and ISO 14001 is that EMAS has stricter requirements than ISO 14001. For example, EMAS requires an initial environmental review while for ISO 14001 this is just a recommendation (Kørnøv et al., 2007). ISO requires only EMS installation and only publication of their environmental policy, while EMAS in additions requires an independently verified public environmental statement that reports on company environmental performance (Brorson & Larsson, 2006; Wateringen, 2005). ISO 14001 requires that organizations assess whether their systems work however for EMAS standards the actual environmental performance is passed through both internal and management review. Furthermore, EMAS' emphasizes company"s commitment to continuous improvement through the use of the best economically viable available technology (EVABAT), while ISO is more flexible in regards to technology (Brorson & Larsson, 2006; Kolk, 2004; Wateringen, 2005). ISO stipulates that suppliers should be informed about company environmental policy, while for EMAS suppliers and those who work with the organization shall also comply with this environmental policy (Kørnøv et al., 2007). An additional difference is that EMAS requires measurable environmental improvements while iso 14001 is more vague stipulating only continuous improvement. Ultimately, the most recent version of EMAS, EMAS III that was published in 2009, is adapted to promote and incentivize implementation within small and medium size companies (Brorson & Larsson, 2006).

Remmen states that most companies take their departure from ISO 14001 and then add additional elements to fulfill EMAS criteria (Kørnøv et al., 2007). The reasoning could be due to it being easier for companies to implement ISO 14001 standards rather than EMAS as a result of the lower demands, that ISO is an international standard rather than the EU EMAS, and that ISO 14001 is more compatible with other standards such ISO 9001 (Kørnøv et al., 2007). It will be interesting to see what the findings will be within the oil industry and considering that 5 of the companies are European to see if this will make a difference within the findings.

1.1.4 EMS in the Oil Industry

There are numerous petroleum councils and associations: Canadian Association of Petroleum Producers (Canadian Association of Petroleum Producers (CAPP), 2012), Australian Petroleum Production and Exploration Association Limited (APPEA) (Australian Petroleum Production and Exploration Association Limited (APPEA), n.d.), American Petroleum Institute (American Petromeum Institute (API), n.d.), International Oil and Gas Producers Association (OGP) (International Oil and Gas Producers Association (OGP), n.d.), Natural Gas Companies in Latin America and the Caribbean (ARPEL) (Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean (ARPEL), n.d.), and The global oil and gas industry association for environmental and social issues (IPIECA)(The global oil and gas industry association for environmental and social issues (IPIECA), n.d.).

While the oil industry has no environmental management system standard that is specific for its industry it does on the other hand have recommendations and guidelines on environmental management systems in application to the oil industry. Examples of these guidelines are: APPEA"s Code of Environmental Practice, American Chemistry Council (ACC) Responsible care (RC 14001 or RCMS), APIs Model Environmental, Health and Safety (EHS) Management System and Guidance Document, American Petroleum Institute Model EHS Management System and Recommended Practice 75, OGP"s Guidelines for the Development

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and Application of Health Safety and Environmental Management Systems consistent with ISO 14001, IPIECA"s A common Industry Approach to Global Standards and Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean (ARPEL) guidelines for the oil and gas industry in Latin America and the Caribbean (Hoffman, 2006; Statzer & Baldwin, 2011; Dixon Thompson, 2002; Wawryk, 2002).

1.1.5 Context for EMS

Conclusively, Environmental Management Systems are, easily put, tools for environmental management. They are conceptual frameworks designed for companies to manage their environmental aspects, impacts and issues in their daily processes through a structured, systematic and consistent approach to conducting daily operations (Brorson & Larsson, 2006; Wateringen, 2005). However, currently there are no regulations in place for EMS implementation, and the decision to incorporate environmental management systems to company operations is up to the individual companies (Wawryk, 2002). This is also true for the way in which companies design and setup their environmental management systems. Nonetheless, in spite of them being only voluntary, there are voluntary standards for EMS. As a result, considerable variation in the structure and design of company EMS frameworks and models can ensue.

Within current literature, there is a lack of information on how companies set up, design and structure their environmental management system frameworks, in addition to a further lack of knowledge on a comparative analysis of company environmental management system frameworks.

1.2 Focus problem

The oil industry in particular is one with a potentially high environmental impact. According to Hansens findings, due to the stakeholder pressure, the higher environmental impact industries, such as the chemical and extractive industries are more likely to assume environmental controls (Hansen, 1998; Wateringen, 2005). In addition to being a high environmental impact industry, the big petroleum companies are working in various sectors of energy, with numerous subsidiary companies around the world, thus making the process of managing environmental issues more complex and challenging. While, environmental management systems are tools that help companies manage their environmental aspects and issues, there is no overarching international legislation for how oil companies specifically should manage their environment aspects and impacts. Furthermore, oil companies and industry groups alike have acknowledged that there are inadequacies in environmental laws and that best practices should be adopted (Wawryk, 2002).

Currently, industry groups, associations, nongovernmental and intergovernmental organizations have developed codes of conduct, guidelines and best practice standards in order to address these inadequacies (Wawryk, 2002). As a result, one environmental management practice that has emerged from the guidelines and standards are environmental management systems. However, while guidelines and voluntary standards have emerged there are no legal international environmental management standards (Wawryk, 2002). With little legally binding requirements, companies can choose if and how they incorporate EMS into their business practices; thus, producing a large variation range in the way the framework design and EMS is set-up. In addition, standardization of company EMS systems does not guarantee a certain level of environmental performance by the company, which gives less incentive to standardize environmental management system framework designs (Wateringen, 2005). Richard Welford states that in reality every organization will take an individual approach to developing an EMS system due to differing management

structures, products, services and processes, priorities, and internal and external financial and political factors (Welford, 2009).

There is little information available on what the current practices and tendencies within the industry are. Two articles Wawryk (2002) and Caroilina Guedez Mozur, Desiree de Armas Hernandez, Rosa Reyes Gil y Luis Galvan Rico (2003) both address EMS" as an environmental management trend within the industry. However, neither of them addresses what is being done specifically with framework design in the oil industry.

In addition, the dissertation thesis „The Greening of Black Gold" by Wateringen (2005) addresses certain aspects of environmental management system frameworks within the oil industry, however, the main focus of the paper is environmental management looking at the industries environmental strategy and environmental structure alignment with the company strategy and structure. Thus, there are components of EMS framework and design that were left unaddressed.

Therefore, an even further lack of information regarding what is happening with environmental management systems in the oil industry is observed. Specifically, knowledge on if they are being used in the industry, and if so how are they being designed and set-up? Are there any trends? What are the implications of these trends?

1.3 Literature review

The most directly related article to this study is a Spanish journal article, Los Sistema's digestion ambiently industrial petrol era international" by Carolina Guedez Mozur, Desiree de Armas Hernandez, Rosa Reyes Gil and Luis Galvan Rico (2003). This article states that environmental management systems are currently one of the most used strategies to improve environmental performance alongside with achieving economic goals. It gives a background historical development of environmental caution, introduces ISO standards, the benefits of incorporating environmental management systems in companies and then goes on to give case study examples of companies within the oil industry by providing a few highlights about their environmental programs and environmental management systems (Guédez Mozur, De Armas Hernández, Reyes Gil, & Galván Rico, 2003). However, this article has several things it does not address. Firstly, the article does not provide a historical development of Environmental Management systems but rather the development of environmental caution in industry. Secondly, it does not define and explain EMS (Definition, Purpose & Structure) clearly, differentiating the concept and tool EMS from the ISO standard 14001. Thirdly, it does not provide a review of all the EMS Standards, EMS in Oil Industry and the EMS Standards and Requirements. Fourthly, it does not provide consistent information for the case study examples, with a comparative analysis addressing what is being done similarly or differently from all these case studies. Ultimately, neither does it provide any insight of the implication of its findings for the industry in the future.

The dissertation thesis "The Greening of Black Gold" by Wateringen (2005) explores the multinational corporations of the oil industry the relationship for its environmental management behavior. It addresses the alignment between the selected oil company's environmental strategy and environmental structure within the time range period of 1990- 2002 (Wateringen, 2005). This thesis does not focus on the oil industries environmental management system. Rather, environmental management systems an element for seeing how environmental strategy and structure is aligned in relation to corporate strategy and structure

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and as a result there are aspects of EMS framework design that are not addressed. The paper was stumbled upon by this author when this paper was already well underway; therefore, the structure of this paper was then reformulated to incorporate some of the aspects that Wateringen had addressed within her thesis. The contribution of Wateringens thesis to this paper is that the author had very valueable information on what was done previously within certain oil industry companies (that were common with this paper) in reference to environmental management systems. These findings were used and added onto, to establish a timeframe trends analysis that will be the base to propose predictions that indicate in what direction the industry is heading. It was also one of the main sources for understanding what to include in the scope of the findings of this thesis.

A joint study „An Overview of Corporate Environmental Management Practices" by the OECD Secretariat and EIRIS (2003) presents the environmental management practices of 1509 enterprises listed in FTSE All-World Developed index as of 10 September 2003. However, this report was not tailored specifically on environmental management systems but rather Environmental Management Practice in general and furthermore it was for a variety of industries and not just the oil sector. However, it did help in designing the scope of what specifically this study will be addressing and looking into within EMS (OECD Secretariat and EIRIS, 2003).

The article "Similarities and Differences Among Environmental Management Systems" by Richard N. Andrews (2001) looks into the range of EMS to date to establish the similarities and differences in choices. The paper looks into 40 facilities from the National Database on Environmental Management Systems that have implemented 14001-based EMSs (Andrews, 2001). While, this article does not address all EMS standards, none standard EMSs, specifically the oil industry furthermore it does not focus specifically on the framework design. However, it was the first comparative EMS article that would further inspire the direction of this paper to discover the range of EMS framework designs with the oil industry and to categorize them.

The article Empirical Evidence on Environmental Management Practices by Boris Urban and Deon P. Govender (2012) is a research study for on the implementation of and practices of EMS within "suppliers of industrial coatings raw materials and industrial coatings manufacturers" in South Africa. It aims to generate knowledge and to collect empirical data on environmental management practices (Urban & Govender, 2012). Although, there are many differences of from my area of focus to that of this article, it helped orient this paper specifically with how to establish a descriptive company profile for later comparison.

1.4 Aim

This thesis aims to first provide a background on the historical development of EMS through looking at EMS within Environmental Management and the oil industry, and also highlight the current standards and requirements.

Secondly it aims to generate knowledge on EMS Framework Designs specifically within the oil industry by identifying if there is a real-life phenomenon in regards to the use of EMS in the oil industry. Also, it seeks to determine the level of emergence of these phenomena and trends in relation to how EMS is designed and set up. Thirdly, it will explore the current trends by addressing if is it a harmonious approach, if there is consistency within the industry and highlighting the major differences encountered. Ultimately, it will

evaluate the implications of these trends for the industry by looking for historical EMS development within the companies themselves in order to possibly predicts a future path for EMS in the oil industry.

1.5 Purpose

The purpose of this study is to first synthesize information regarding the EMS development, guidelines and standards within the industry in order to fill a knowledge gap currently identified. Secondly, to see if there is a high level of EMS adoption as Hassens findings concluded is the tendency for high impact industries. Thirdly, it is to generate knowledge on the different EMS framework designs and models within the industry thereby identifying the current trends and practices. Fourthly, it will provide an analysis for what this could imply for the oil industry. This can potentially help corporations within the oil industry who are interested in incorporating EMS to their corporate structure or review their current design of EMS, or understand the current practices in the business.

Furthermore, it could provide insight to government on the EMS within the oil industry as to what the current practices are, the direction they are headed towards and how the certification standards and different guidelines have affected the industry management structure.

1.6 Research question(s)

How do companies in the oil industry approach EMS framework structure, design and content setup?

1. What is their current approach to EMS framework structure, design and content setup?
2. How has this approach changed over time and what are the current trends?

1.7 Methodology

Study approach and what it will look into:

A case study approach looks into a phenomenon using a variety of data sources (Jack). A case study research design is flexible and adaptive (Cassell & Symon, 2004; Hartley & Benington, 2000; Hartley, 2004). It allows for multiple data collection method (Johansson, 2003), thereby permitting rich data to be collected. This paper uses a multiple case study approach that facilitates the exploration of similarities and differences within and between cases (Baxter & Jack, 2008; Yin, 2003). The author feels that this is the right approach as both quantitative and qualitative data will be needed for the thesis. It also allows for multiple methods of data gathering, something that is necessary when dealing with information that is known to be hard to get.

The multiple cases selected are the biggest 25 oil companies in the world. The 25 companies selected were chosen on the basis of being on the Forbes list of the 25 biggest oil companies in the world 2012. This list is based on the combined volumes of oil and natural gas that these companies produce each day (Christopher Helman, 2012).

1. Saudi Aramco	2. Gazprom	3. National Iranian Oil Co.
4. ExxonMobil	5. PetroChina	6. BP
7. Royal Dutch Shell	8. PEMEX	9. Chevron
10. Kuwait Petrol Corp	11. Abu Dhabi National Oil Corp.	12. SONATRACH
13. Total	14. Petrobas	15. Rosneft

16. Iraqi Oil Ministry	17. Qatar	18. Lukoil
19. Eni	20. Statoil	21. ConocoPhillips
22. Petroleo de Venezuela		23. Sinopec
24. Nigerian National Petroleum		25. Petronas

The first part of this study will be a descriptive case study of the 25 oil companies. A descriptive case study describes within the current context an occurrence or phenomenon (Baxter & Jack, 2008; Yin, 2003). In application to this paper, this will mean first establishing the company's profiles and what is currently happening with EMS framework design in 25 of the largest oil companies. The purpose of this is to provide an insight to what is currently the state of general practice within the companies with regards to how the EMS frameworks are set up and designed.

Second this study will do a comparative analysis: To compare and contrast the different companies, to find out the similarities and differences in the oil industry EMS frameworks. It will be a comparative content analysis of EMS framework design (Bryman, 1989).

Thirdly, using a trends analysis with the information collected on the evolution of EMS within the companies this paper can establish what the current trends show. i.e. if there is a shift of environmental focus, a more extensive certification over the entire company group structure. Ultimately, from all of the information analyzed above this paper will address the implications of all of this for oil industry in regards to EMS in the future (Baxter & Jack, 2008; Bryman, 1989; Yin, 2003).

The two key factors (levels of analysis) this paper will address are:

- **Organizational and Management Structure**
- **Content (what issues do companies address)**

Organizational and Management Structure is important to see how the system is laid out and how it functions. Content will look at what specifically are the companies addressing within their EMSs. In addition, these areas are selected as focus factors due to the sheer size and complexity of environmental management systems within companies, thus the threat of getting caught up in minor details or certain aspects of the EMS. Therefore, this study will not look at the details of the entire system, but will instead focus on certain key areas that would allow for a holistic view of what is being done within EMS.

This study will use secondary data by collecting the data from corporate websites and publications such as Annual Reports, social and environmental reports. It will also use publications that are available and applicable. Many of the companies have policy statements, structural information, focus statements, governance structure etc. accessible through hyperlinks. For further bettering the chances of getting correct and reliable information the author of this thesis payed to get access to sites built for the sharing of publications within the oil industry, such as Onepetro. Further, sites such as Docstop and Scribd were useful when searching for relevant material.

When it comes to the validity and reliability of the data collected the author does recognize the potential threats when it comes to certain data. However, for the purpose of this study the data sample is rather large and it does not require much depth as it is merely supposed to serve as indicators of how the EMS is set up. If the study aimed to dig deeper, this kind of comparative analysis would have been too big and complex because of two large variations in the data sample. The author also regards the validity of the data to be adequate for the same reasons. When it comes to the reliability of data it is very hard to guarantee this one hundred percent, but much of the data is again linked to public reports which are under the scrutiny of

international organizations and certification organizations. Furthermore, many of the reports contain assurance statements from large and well-known international organizations.

1.8 Scope & Limitations

The Health, Safety and Environmental Management systems can be combined into one integrated management system. Yet, the focus of this paper is solely environmental management systems. Due to EMS being affected by the structure and function of the overall integrated system, for the purpose of this study integrated management systems therefore be addressed by looking at solely the first key factor "structure", researched in this study (structure, content and integration). This will determine the overall structure the of the system as a entirety and how EMS will be affected by this structure and function in addition to seeing how EMS is integrated and functions within the overall system.

A few of the companies that have been looked into have acquired other companies. The scope of this paper will however not address these acquiring companies and the EMS changes from before the acquisition to after the acquisition. There are some limitations to acquiring the information of how environmental management systems are designed and set up within the oil industry. Most of the oil companies are only publicly publishing highlights and segments of their EMS systems and framework designs. This makes it difficult to acquire the same type of information across all companies for comparison. In addition, establishing contact with the companies in order to obtain this information is also challenging as most companies do not have contact information to the environmental department. Or the contact information available is to departments/individuals who do not handle these issues.

However, the initial approach to collecting primary data, to contact the companies through email, did not yield results. This resulted in the data collection through interview calls, however, this approach also failed to produce results. Therefore, this study was limited to the information that was found on the company websites, reports and publications and other journal and industry publications. This study is not conducted in order to evaluate and rank companies based on good or bad performance, but rather seeks to observe the different EMS procedures within different companies. Also, while the information sought about company specific EMS frameworks ise general and should not by any means be secretive or hidden because of confidentiality issues, it was challenging for the author to aquire the information on some companies do to lack of availability.

Furthermore, this study presupposes that there could be an additional challenge to acquire such information from companies that are state-owned or companies that are based in states (countries) that are under sanctions e.g. Iran. There are further limitations with the Iraqi Oil Ministry as it is currently restructuring itself. As stated by Dr. Muhammed Abed Mazeel since 2003 the Iraqi Oil Ministry started to act as the national oil company, and in 2007 The Federal Oil and Gas Law Preamble stated that the oil activities that were solely operated by the Ministry of Oil be transferred to the Indepentent Iraq National Oil Company. The Iraq National Oil Company will be independent yet wholly owned by the Iraqi government (Mazeel, 2012). Due to having challenges with acquiring information, where information was not encountered it was either categorized/described as such. This study has kept these findings as such because the author considers that not finding the information is a finding of its own.

There is a difficulty with language that might pose some minor problems, as some of the companies have more information in other languages that are not English. These will be translated; however there could be minor differences in language or meaning due to the translation. EMS is a tool that aids companies in approaching their environmental management. This paper notes that the adoption of an EMS system in itself will not necessarily raise company environmental performance (Welford). However, it will only look at the framework and setup design of the EMS systems within the selected oil companies and will not

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address the successful implementation or environmental performance of a company through EMS. Thus, this paper will look at the trends and the environmental management systems frameworks and not on the implementation of EMS. This analysis is not intended to praise, criticize or rank any of the corporations. Neither does it single out a correct model of EMS, nor that all EMS should look alike. It will simply illustrate the similarities and differences in the current practice.

1.9 Outline

1. **Introduction** - In the introduction the reader will find background information on the development of EMS and EMS in the oil industry. This leads to the focus problem of this study. Following is a literature review on what is currently known about the topic. The aim and purpose of the study is given before the research questions are stated, followed by a methodology section where the reader can examine the approach taken. Finally, in the introduction the author sets the scope and limitations for the study.

2. **Findings** – In the findings section the author describes what is being looked at, why it is being looked at, and the reader can find references to the Appendix where the actual findings are being listed in tables.

3. **Analysis** – This section makes use of all findings by comparing collected data, merging data, and looking for shifts and trends over time. All tables and charts can be found in the Appendix with numbering aligned with the headers.

4. **Discussion** – The author discusses the results of the study and reflects upon how the study was carried out.

5. **Conclusion** – Finally the author states the conclusions to answer the posted research questions, followed by suggesting recommendations for further research related to the topic.

2. Findings

In order to maintain the readability of the thesis, all charts with the collected data for the findings section can be found in the appendix. The figures in the Appendix follows the structure of the findings section.

2.1. Company profiles

(Appendix table 2-1-1 and 2-1-2)

The criterion for selecting the current 25 companies analyzed is that Forbes determined them to be the 25 biggest oil companies in the world (Christopher Helman, 2012). However, having one common trait (being one of the biggest oil companies) does not mean that these companies have identical company profiles or even other characteristics. In order, to provide an insight on company characteristics the first part of this study is to establish company profiles; the idea came from the paper „Empirical Evidence on Environmental Management Practices" by Boris Urban and Deon P. Govender (Urban & Govender, 2012). This will provide insight on how harmonized or different these companies are in their characteristics.

The characteristics that were chosen for this study were the full name, alias, when the company was founded in, where its headquarters are, from which region is the country based in, public or private, ownership, number of subsidiaries, multinational, number of employees, production according to Forbes list, revenues, profit and their Fortune global 500 rank. The company full name and alias were chosen in order to establish the correct company reference and avoid confusion. All further characteristics have been chosen due to the possibility that in further research it could show correlations between these characteristics and the ems framework and approach trends.

The company foundation date was chosen in order to see if companies are newly established entities or have been founded (and evolving) throughout the years. While some company profiles look at establishment dates, in order to determine if entities are recent establishments or have been evolving throughout the years it is specifically necessary to look at the foundation date instead of the established date. This is because within the oil industry, many companies today are the result of mergers or company acquisitions and sales. Therefore, to get a sense of how long the company has been around it is necessary to look at the foundation date from which the current establishment emerged. Where the headquarters are and in which region of the world is the company based in will reveal the locations of these companies. This will demonstrate where the biggest oil companies are located and if there are any location trends or if it is spread around the world.

If the company was public (publicly available on the stock market to buy shares, with at least one share being) or private was chosen in order to see what the company structure is as for example public companies have to answer to its shareholders while private companies do not. The definition of a public company this paper will use is a company that has shares that are traded freely on a stock exchange/market with at least one stock exchange. Companies can be public, but can be majority owned by the state, therefore ownership was chosen to see if companies the companies that were on the open stock market were majority or largely owned by the state or an individual shareholder.

Number of employees, production, revenue and profit are important in order to evaluate the size and power of the companies within the industry. It was researched by looking at corporate documents, however in the instances where the corporate documents did not refer to the number of employees other sources such as the Forbes global list 2000 were used. The number of employees can play an important role in the structure and organization of a company, therefore it is important to look at because it demonstrates not only the size and power of the company but will also support the identification of possible structural complexities to follow up on in further research. The production, revenue and profit were chosen to demonstrate the

company's size and power. Product, revenue and profits can be correlated; however, they do not have to be. By having these three separate categories, it will be possible to see the current company situation, size and power.

2.2. Comparative

Second part of this study is a comparative analysis on oil industry EMS frameworks designs and approaches. It should be noted that choosing what to focus on was guided by the background information on EMS and provided guidance of the literature review. To do such an analysis for 25 companies it is not possible to focus on the details of the entire system, therefore three key factors (levels of analysis) will be the focus point guiding this studying:

- Organizational and Management Structure
- Content (what issues do the companies address)

2.2.1 Management structure

Organizational and Management Structure is important to see how the system is laid out and how it functions. This level of analysis focuses on the following for each of the companies individually.

2.2.2 Do companies have an EMS system?

This is the first and most important question to establish if the company has incorporated a systematic environmental management approach, in order to be able to follow up and compare their EMS designs and approaches.

2.2.3 When was it introduced?

This will establish what time period the companies introduced their system. In addition, it will further classify if the companies have been the early trends setters (incorporating their systems in the 1990-1999), middle ground incorporators (from 2000-2009), recent incorporators (from 2010) or those who have not yet incorporated an EMS system.

2.2.4 What is the name of their EMS system?

From the companies that have incorporated EMS systems some choose to title their system just as an EMS, while other companies choose to adopt an individualized title for their management system. This question will look at what do the companies name their EMS. The title of their system provides clues to their design approach such as standardized ems system, integrated components horse management system.

2.2.5 Is it an integrated system and what are the components?

Of the companies that have an EMS system, this question addresses if their EMS is incorporated into an integrated system and if so what are the integration components. This is important in order to understand the complexity and structure of their environment management systems, and if it is part of bigger management system.

2.2.6 What is the scope of the EMS?

It has been established that the 25 biggest oil companies are large companies that have an extensive corporate structure. The scope of the EMS system shows the extent of the EMS application throughout this corporate structure. The applicability extent of the EMS will classify the information into different

categories: some operations, entire corporate head group, within the nation, the entire company and majority subsidiaries, and entire company and all subsidiaries. (Appendix 2-2-1-2)

2.2.7 What is the organizational structure of the environmental management system?

There are many different approaches a company could take to establish the organizational structure of their environmental management system, and there are just as many variables for this research to identify within this organizational structure. However, in order to get an overview of how the 25 biggest oil companies are currently setting up their EMS organizational structure and not get tied up on minor details, and to attain information that is comparable this research will focus specifically on the following questions:

2.2.8 Do companies have the key elements? If so, how many key elements do they have? What are elements do they have?

This is to establish if companies find certain elements of their EMS system to stand out and be of importance. If a company does consider these specific EMS elements of importance, then how many of them are considered to be important and what are those important elements.

2.2.9 How did they design their system?

This question looks into the approach the company took to set up and design their system. These will be classified in into the following three categories: standardized design system, a self-design/ tailor design, and a self-design compatible with standards.

2.2.10 What standards do they use?

As established in the previous question, companies can choose to set up their management systems in a standardized design system, a self-design/tailor design, and a self-design compatible with standards approach. However, it is likely that whichever approach the company chose to pursue it still referenced different international standards when designing their system. Different standards can shape company systems in different manners, therefore, it is important to look at which of these standards were used as reference. The answers possibility responses are of the following: ISO 14001, EMAS, BS 8850 and BS 7750. Is it compatible and certified? Is it compatible but not certified? Is it not compatible and not certified?

2.2.11 Is it certified and compatible?

As in the previous question, the standards were used as reference for the set-up and design of the management systems of the companies is established. The next step is to see if the entire management system was designed in a way that it is compatible with the entire individual standards and in addition the company chose to follow up with that by certification. Or was it designed in a way that it is compatible with the entire individual standards but the company chose not to follow up with the certification? Or was it possible that the standards were used just as a reference point for the company but instead of designing their management system in accordance with the standard they opted to adapt it to suit the needs of their company.

2.2.12 What guidelines did you use to develop the environmental management system?

In addition, to numerous management system standards that could be referenced by the companies for the design and set-up of a management system, there are many other guidelines and industry best practices that the companies can chose to reference. Therefore, to comprehend the current management system design of each company individually it is necessary to look at also what guidelines and industry best practices they have referenced. The collected information will be categorized in the following manner: GEMI, National

Standards, International Standards (general), APPEA"s Code of Environmental Practice, American Chemistry Council (ACC) Responsible care (RC 14001 or RCMS), APIs Model Environmental, Health and Safety (EHS) Management System and Guidance Document, American Petroleum Institute Model EHS Management System and Recommended Practice 75, OGP"s Guidelines for the Development and Application of Health Safety and Environmental Management Systems consistent with ISO 14001, IPIECA"s A common Industry Approach to Global Standards, and Natural Gas Companies in Latin America and the Caribbean (ARPEL) guidelines for the oil and gas industry in Latin America and the Caribbean.

2.3. Content

The content section will look at what specifically the companies are addressing within their EMS. Company EMS's typically has principal guiding documents such as environmental strategic directions, environmental management plans, environmental policy statements, environmental principles, environmental targets, environmental objectives and environment programs. To understand in full extent an EMS it is necessary to look at what is the content that is being addressed within each system, i.e. where in what direction the companies are going, and what are they striving to achieve. In addition, these questions will also demonstrate what guiding documents companies have incorporated.

2.3.1. Do they have an Environmental Policy?

An environmental Policy is a statement established by the company to what it wants to achieve in its overall environmental performance. This document will also guide the companys entire environmental management including other environmental management guiding documents such as environmental targets, objectives and program and is a point of reference for the company to check on how their performance against. This document is important because it communicates the company goals and aims and shows the company they are commitment to making their environmental performance better. Companies that follow ISO 14001 are required to establish environmental policies (Brady, 2004; Brorson & Larsson, 2006; Kirkland, 1997; Kørnøv et al., 2007; D. Thompson & Kirkland, 2002; Dixon Thompson, 2002; Welford, 2009).

2.3.2. Do they have an environmental strategic direction?

Environmental strategic direction shows what the company is seeking to achieve within the future period (usually a predetermined length). According to Peter Schwartz a strategy is setting priorities for the company's long-term development (D. Thompson & Kirkland, 2002; Dixon Thompson, 2002). Therefore, an environmental strategic direction is setting priorities for the long-term environmental management of a company. This environmental strategic direction will guide rest of the environmental management guiding documents such as environmental targets, objectives and programs. However, an environmental policy can be guided by the environmental strategic direction or the strategic direction could be guided by the environmental policy, the relationship is not clearly determined and will be defined by the individual companies. This is important to see if the company has a future sense of direction of where it is heading. It is only feasible if the company does have an environmental strategic direction to establish what specifically are they aiming to strive towards in the environmental management area. As companies cannot consciously achieve or strive towards aims that they have not yet made. Yet, due to lack of information gathered for companies with environmental strategic direction as such data was not disclosed in numerous occasions, the overall company strategy was used when available (Brady, 2004; Brorson & Larsson, 2006; Kirkland, 1997; Kørnøv et al., 2007; D. Thompson & Kirkland, 2002; Dixon Thompson, 2002; Welford, 2009).

2.3.3. Does the company have environmental targets?

Setting up targets relevant to the appropriate levels and functions within an organization, designation or responsibility, time-frame; targets are objectives with a timeframe, Canadian standards association describes it as specific performance requirements as the targets should be measurable for operating procedures (Brady, 2004; Brorson & Larsson, 2006; Kirkland, 1997; Kørnøv et al., 2007; D. Thompson & Kirkland, 2002; Dixon Thompson, 2002; Welford, 2009).

2.3.4. Do they have environmental management plans?

Environmental management plans are the carrying out factors of EMS systems and can give indications on the direction of the company's environmental short and long-term actions. (Brady, 2004; Brorson & Larsson, 2006; Kirkland, 1997; Kørnøv et al., 2007; D. Thompson & Kirkland, 2002; Dixon Thompson, 2002; Welford, 2009).

2.3.5. Do they have environmental principles?

Environmental principles are fundamental positions and rules form the foundation for the manner in which the company conducts its business and operations no matter what policies, strategic directions, plans, targets, objectives and programs the company may have. Environmental principles are therefore key framework documents for how companies address environmental management. Yet, due to the lack of information gathered for companies wh environmental principles, as this data was not disclosed in numerous occasions, the general business principles were used when available (Brady, 2004; Brorson & Larsson, 2006; Kirkland, 1997; Kørnøv et al., 2007; D. Thompson & Kirkland, 2002; Dixon Thompson, 2002; Welford, 2009).

2.3.6. Does the company have environmental objectives?

Objectives are part of ISO 14001 requirement, they are the overall environmental goals from environmental policy; objectives are more specific goals and policies a company wishes to achieve (Brady, 2004; Brorson & Larsson, 2006; Kirkland, 1997; Kørnøv et al., 2007; D. Thompson & Kirkland, 2002; Dixon Thompson, 2002; Welford, 2009).

2.3.7. Do they have an Environmental Program?

The detailed set of activities deisgned to achieve the objective and the implementation of policies. In addition, companies that follow ISO 14001 are required establish and implement environmental programs (D. Thompson & Kirkland, 2002; Dixon Thompson, 2002). The following principle questions will be the focus of this research on guiding documents (environmental strategic directions, environmental management plans, environmental policy statements, environmental principles, environmental targets, environmental objectives and environment programs).

2.3.8. Content of compliance:

When addressing what specifically the companies are mentioning within their guiding documents, the first and foremost priority is to look at the environmental regulation and legislation is the company aiming towards. This is to see if it is at all mentioned within the documents, and if so then to what extent is their level of desired compliance. This will be sorted into three categories: aim for legal compliance, above legal compliance, or best practice compliance.

2.3.9. How do firms allocate the responsibility for their environmental management?

Environmental management systems promote the clear establishment of responsibility within the companies. Companies can refer and deligate certain responsibilities on certain level of employees within their guiding documents. This question will look if the companies do so in reference to environmental management and if so to which level of employees? For this there will be three possible categories: the board level, Managerial Level or Individual responsibility level.

2.3.10. Intra-firm coverage?

Does it cover the entire businesses group or only parts of it? Companies can choose to have a centralized approach or a decentralized approach. However, even with decentralized approaches companies can make some of their documents apply across the board. This question will determine if this guiding document valid is across the business the company group or only for some parts.

2.3.11 Is their management system specifically referenced?

Management systems can be incorporated into the guiding documents for a variety of different purposes (implementation, responsibility, revision). By specifically referencing the management system within their guiding documents companies are placing additional value and importance. Therefore, addressing if there is a specific mention of their management system within the guiding documents will help in understanding how much value a company places on their management system.

2.4. Trends

The third part of this research is a trends section with the information collected on the development on the environmental management, more specifically with regards to EMS within the oil companies. This will establish what the current trends and practices are and give a sense of the progress in the sector. This comparative analysis will use the information for what was done in previous years from S.L. van de Wateringen 2005 dissertation thesis titled „The greening of black gold: towards international environmental alignment in the petroleum industry". Most of the company practice information is specifically from the 7th section of part II of the thesis.

As this seventh section of the thesis the author will provide the base information against which the current collected information will be compared in order to see in what directions the companies have evolved in. This study is thus limited to the areas of study from this dissertation. The topics of study that are available for both areas within this trends analysis research are Codes of Conduct: general information, code of conduct overview, code or conduct environmental specificity, environmental reports: strategy, policy and code of conduct reference and inclusion, environmental reports: reference to ems systems, environmental reports reference to monitoring and verification, verifying party, content analysis, environmental policy: content analysis, Environmental management system reference to ISO 14001, and specificity on environmental performance indicators. In addition, there are some areas of study where S.L van de Wateringen has provided information on what these companies did previously. This will allow for some categories to have a longer timeline to what has been happening within the companies and the industry.

The companies this section of the thesis looked into are BP, ChevronTexaco, ConocoPhillips, Eni, ExxonMobil, PDVSA, Statoil, Pemex, Phillips, Repsol YPF, Shell, Marathon, Petrobras, and TFE. The trends analysis research areas addressed by this study for both the common company evolution and industry-wide progress are: The trends analysis part of this research will address two areas first the common company evolution and secondly the overall industry-wide progress. The comparative analysis of the common company evolution will only be applicable to those common companies that are addressed within the scope

(25 of the world's largest oil companies on Forbes list 2012) of this paper and from the "The greening of black gold: towards international environmental alignment in the petroleum industry" dissertation thesis. Thus, within common company evolution the following companies will be explored: ExxonMobil, BP, Royal Dutch Shell, PEMEX, Chevron, Total, Petrobras, Eni, Statoil, ConocoPhillips and PDVSA.

The second area, industry-wide progress, will utilize the average results of the companies found within "The greening of black gold: towards international environmental alignment in the petroleum industry" thesis dissertation and compare them to the average results of the 25 biggest oil companies from the Forbes list 2012. This will provide information on the past, middle and present time period, thereby allowing from a comparative trends analysis to predict in what direction the industry is heading towards for the future. However, the findings section of this paper, will present the only the individual findings of all the companies addressed in Wageningen's study and the individual findings of all of the 25 biggest oil companies from the Forbes list 2012 will be presented. Some of this information will be repetitive, as it has been also previously presented and formed part of the common company evolution section. The average results of the companies and the comparisons between the two studies are addressed within the analysis section of this paper.

The author chose to include both the latest findings for the common companies and for the industry-wide companies in order to strengthen the robustness of the data and the later-to come analysis. Showing both results will give an indication of the global representativeness of the common companies as well as further generate knowledge on those companies who were not included among the common companies.

2.4.1. Codes of Conduct: Titles and dates of adoption

Common Company & Industry-wide progress

Code of conducts and ethics are written documents that lay down the rules, norms and principles of the manner in which the company conducts daily business. They are the guiding documents that form the company's operational framework. Within different scholarly literature and company practice the terminology of such documents vary e.g. Code of Conduct, Standards of Business Conduct, document titles using both code of conduct and business ethics. In addition, companies can have more than ethics document e.g. Separating codes of conducts and codes of ethics, addressing different levels of management, shorter version of ethics document. (Szegedi, 2011) An EMS is a systematic manner to address a company's environmental management. To aid the understanding of how an EMS functions and is set up within the company operations, this paper will look at the overall the documents that lay down the rules, norms and principles of daily conduct. This will show if a company has set up such codes and if they have, then how have then set-up such documents. The date of adoption and modification are relevant to see if modifying such documents is a common approach and if companies frequently modify their guiding documents. Wateringen's original reasoning behind this topic of choice was to see when companies first issued their codes of conduct. However, Wateringen was not able to reveal this information (when the codes of conduct where issued) for any of the companies with Shell being the only exception. Instead, the only information disclosed the authors estimation when the first codes of conduct were introduced. This research paper has kept this as a topic, however instead of looking for when the companies first adopted their codes of conduct, for this section the question addressed is if since then if there have been modifications to the codes of conduct and when was the most recent modification. In addition, to looking for if there have been any modifications to the title of the documents.

As Wateringen only disclosed estimated time of first code of conduct, the information for earlier code of conducts was not available (except for a few cases). Therefore, for this section more research was done in order to find information on when these 10 companies performed the latest revision of their codes of conduct and to recheck if more information on when the original code of conduct was first disclosed. In

addition, this was also conducted for the industry-wide companies. This resulted in looking at what was the title of the original code, what is the title of the current code, when the code of conducts were originally established (for companies where concrete information was not available Wateringen's estimation was used), the date of the adoption of the previous code of conduct, and the date of the current code of conduct, in addition, to if the company has any supplementary or additional codes for the three time periods.

2.4.2. Code of Conduct: number of elements for each category

Common Company & Industry-wide progress

Wateringen researched the structure of the codes of conduct by splitting them up into three categories (environmental, social and generic) and seeing how many (in percentage per category) elements from the code of conduct referred to each category. This aids in demonstrating how much importance is attributed to each of these categories within the code of conduct. Nevertheless, this topic will not be addressed within both the common company evolution and industry-wide progress section of this research as companies structure their ethics documents very differently. Thus, it is difficult to harmonize the different structures so they are comparable to one another. Furthermore, Wateringen did not precisely clarify what constituted as an element within the codes of conduct, therefore it is impossible to replicate the methodology for acquiring the answers to this research question.

2.4.3. Code of Conduct: Overview of environmental specificity in codes of conduct

Common Company & Industry-wide progress

This paper explores if the company codes refer to environmental policies (company strategy, goal, aim), environmental system (the structure) and sustainable development are referenced within the codes of conduct and what was the specific wording used. Exploring the specific environmental referencing within such guiding documents is important to see what within environmental management do companies consider important and to what extent or level are their commitments. In order to have comparable data, both sections (common company and industry-wide progress) be structured as within Wateringen thesis. Thus, addressing if the three areas (environmental policies, environmental systems and sustainable development) are referenced within the company codes and presenting if encountered the exact company statement for each of these areas for the three time periods: first, middle and latest.

2.4.4. Codes of Conduct: Specificity on Monitoring and Sanctions

Common Company & Industry-wide progress

This paper will not address the specificity of monitoring and sanctions within the codes of conduct. As a result of focusing on EMS framework set up and design, the specificity and extent that a company subscribes itself within their codes in regards to monitoring and sanctions is not within the limits set out by this paper. Furthermore, a content analysis will not be addressed for anything that is not within the boundaries of EMS or defining overall corporate structure.

2.4.5. Environmental reports

The petrochemical sector was the first in releasing individual environmental reports in the 1980s and early 90s (h. Jenkins and N. Yakovleva). Reporting is relatively common within the oil industry, this is considered usual for a sector that has fairly large environmental impact as stakeholders (Customers, investors, NGOs and affected communities) are pressing for companies to disclose more information on their environmental commitment and performance. Environmental Reports allow companies to report on their environmental commitment and environmental performance similar to the manner in that they report financial

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performance. The use of environmental reporting guidelines provides a systematic approach aiding companies within the areas of disclosure, comparable data and metrics.

Reporting aids companies with establishing their aims, directions, policies, principles, procedures of performance revision, performance indicators and change management. (GRI and h. Jenkins and N. Yakovleva). Regular company environmental reporting helps ensure that there is a constant monitoring and evaluation occurring within the area of environmental performance. These findings will affect the decisions of the company direction. Thus, it also serves the as a communication tool by communicating internally and externally an organization's performance and evaluating them against their targets and objectives.

As company reports that are separate from the financial reports play an important role in the framework and direction of the company and perform a supportive function in communicating the company's environmental performance and evaluating these against the company targets and objectives. Thus, these reports not only influence company EMS framework but also play an important role the continuous review process, as a constant monitor, evaluation and revision process must be in place in order provide for the content of the report.

2.4.6. Environmental reports: first issues and critical events

Common Company Progress

Wateringen establishes when the first environmental reports were introduced, and what the critical events were that could have made an impact for companies to introduce separate environmental reports. However, Wateringen already establishes when the first environmental reports for the ten common companies, and as there is nothing new that could be added, this paper will not address when the first environmental reports were introduced by the common companies.

Industry-wide Progress

The aim of having a trends analysis section for industry-wide progress is to look at Wateringen's average findings and compare them with what the industry is currently doing. This means trying to shed light to the differences between current and previous practices, in addition to using this information to indicate in which direction the industry is heading in. The first environmental reports within the industry were already addressed within Wateringen's study. Revaluating these findings by introducing new information from additional companies that are addressed within this study might change the overall results encountered with Wateringen's research. However, this would only alter previous findings and not produce any findings on the current state, the difference between present and past findings or indicate for the industry and future direction. Thus, first environmental reports will not be addressed within industry-wide progress.

2.4.7. Environmental Reports: Change of Scope

Companies quickly started including other areas of concern within their separate individual environmental reports, such as health and safety, thus resulting in health safety and environmental reports. This development of integrated sustainability concerns continued with companies developing a wide range of integrated reports eg. Environmental and Social reports; health, Safety, environment and community; reports to society; and ultimately, sustainability. Sustainability reports give information about economic, environmental, social and governance performance.

It is important to understand the scope shift within company environmental reports, as this demonstrates the direction the companies will be steering the overall guiding documents in addition to specifically the ems guiding documents. Furthermore, integrating other issues within environmental reports can also

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indicate what the company is placing within the same importance of environment and if it would be more inclined to integrate their current ems as they as already integrating their environmental reports.

Wateringen looks at the scope and focus that companies have within their first environmental reports and within their latest versions of their separate environmental reports. Both early reports and late reports are split into two categories of early reporters and late reporters based on when they first introduced their separate environmental reports. The category scope ranges in the following: Environmental; Health, Safety & Environment, Environmental and Social (double); and Sustainability (triple (Environmental, Social and Economic)).

Common Company Progress

Using the information Wateringen provided within her thesis and comparing to what is currently happening within the ten common companies in relation to the scope of the company environmental reports is addressed within three time periods: the first reports, the middle reports (referred by watering as latest versions) and the most recent reports. There are slight modifications to the original focus within Wateringen's thesis, as this paper will not have to categories of reporters for each of these report periods, as this study's focus is the scope change and not the company's ranking in establishing an environmental report. Furthermore, Wateringen only has a range of only four different scopes, this paper for comparison against of past reports to current reports will add an additional scope. The current GRI definition of a sustainability report includes four issues: environmental, social, economic, and governance. Thus, there will be a range of five scopes: Environment; Health, Safety & Environment; Environmental and Social (double); Sustainability (triple); and Sustainability (*quadruple).

Industry-wide Progress

Looking at the overall industry development, the findings will be sorted in the same manner as the common company progress: with three time periods and 5 scope possibilities, in addition to not having any company categorization (early reporters and late reporters). However, due to the different companies explored within the different periods, the findings will be based on the averages rather than exploring the individual companies progress.

2.4.8. Environmental Reports: Policies and Codes of Conduct

Common Company & Industry-wide progress

One of the main elements of an EMS is for a company to establish guiding documents in particular an environmental policy. Another important guiding document is a code of conduct that manages the way the company conducts its daily operations. These documents are also used by companies as benchmarks for companies to compare their current performance against their goals and their norms and principles. Thus, the incorporation of policies and codes of conduct into environmental reports demonstrates the importance a company places on these for their environmental performance and aids companies in communicating their commitments to stakeholders and demonstrating in their progress in regards to environmental performance against their policies (goals) and codes of conduct (norms and rules). Addressing if environmental reports contain company environmental policies and codes of conduct, Wateringen set up the information collected by company and sorting these once again into early reporters and late reporters. Furthermore, two categories were set up to see if the initial reports and the latest reports included first the environmental policy and referenced the codes of conduct.

For exploring both the common company and industry-wide progress there will also be slight modifications to the original focus within Wateringen's thesis, as this paper will not have to categories of reporters for

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each of these report periods. The reports researched would be addressed within three time periods: the first reports, the middle reports (referred by watering as latest versions) and the most recent reports.

2.4.9. Environmental Policy: Content Analysis

Common Company & Industry-wide progress

An environmental policy is an important document and component of an EMS framework because it communicates the company goals and aims and shows that the company they is commitment to improve their environmental performance. As a key element within EMS systems, it guides the company direction with regards the establishment of other guiding documents and to their overall environmental performance. Therefore, what companies choose to include within their environmental policies significantly influence the entire company operations.

Wateringen looks at the content analysis selecting 10 elements and looking at if the company first environmental policies and latest environmental policies reference them. The ten elements are regulation, management system, standard, performance target, specification of environmental impact, business context, stakeholder consultation, reputation, leadership and sustainable development. The information collected by company was sorted once again into early reporters and late reporters.

Remove Business context cannot distinguish what was referred to that by the author therefore will be left out. This study will only incorporate what is called environmental policy what could be called something else but considered environmental policy will not be used for the results. As previously stated, this paper does not sort the companies into categories of reporters, as this study's focus is not the company's ranking. The environmental policies researched would be addressed within three time periods: the first reports, the middle reports (referred by Wateringen as latest versions) and the most recent reports. Furthermore, the information was collected for the remaining 9 elements and added within the findings table. However, as reference to management systems was the most relevant category for the scope of this paper, it was therefore the only section to be included within the analysis. Both common company and industry-wide progress use the same approach for their method of findings for the content analysis within environmental policies.

2.4.10. Environmental Reports: Reference to EMS

Common Company & Industry-wide progress

What companies choose to address within their environmental reports demonstrates the areas of importance and of commitment. This in addition drives the direction of the company framework structure, operations and performance. Looking at if EMSs are referenced within the policy documents demonstrates if the EMS are considered to be important for the companies and also indicates if they are applied for the purpose of improving and managing company environmental commitment and performance.

For Wateringen's thesis the companies are sorted into early reporters and late reporters. In addition to looking if the company references the EMS and EMS title for both the first reports and for the latest reports. This paper explores EMS reference within environmental reports in three time periods: the first reports, the middle reports (referred by Wateringen as latest versions) and the most recent reports using the same approach method for both common company and industry-wide progress. However, it does not sort the companies addressed into early reporters and late reporters. In addition, it will also look at if there is an EMS description within the latest environmental report.

2.4.11. Environmental Reports: Reference to ISO 14001 & EMAS

When looking at EMS framework structure and design it is important to see if international standards influenced its setup. Environmental reports report on the company commitment and environmental performance. Thus, to indicate if companies are committed to adhering to international standards the best approach is to see if these internationals standards are referenced within their environmental reports. Wateringen"s research focused on both early reports and latest reports categorizing these within early reporters and late reports. Here classifying the companies as such helped as ISO 14001 was not introduced till 1996, therefore many of the early reporters were not able to introduce a standard that was not in existence. In addition, Wateringen also makes observations if companies referenced the European EMAS.

Common Company Progress

Thus, for common company evolution the classification of the companys into early reporters and late reports will be maintained. Also, this paper addresses environmental reports reference to ISO 14001 and the European EMAS in three time periods: the first reports, the middle reports (referred by Wateringen as latest versions) and the most recent reports.

Industry-wide Progress

For exploring industry averages, this paper does not classify the companies into early reporters and late reporters. Nevertheless, it still focuses on environmental reports reference to ISO 14001 and the European EMAS within three time periods: the first reports, the middle reports (referred by Wateringen as latest versions) and the most recent reports. In addition, for the latest environmental report, this paper will explore if other standards as ISO 9001 and OHSAS 18001 are also referenced.

2.4.12. Environmental Reports: Monitoring and Verification

Common Company and Industry-wide progress

This paper does not go in detail into the monitoring and verification within environmental reports. While monitoring and verification are important parts of ensuring that the companies are operating and documenting in accordance to their own and external standards. Nevertheless, an in depth analysis into the verification statement by looking at the content analysis or verifying party, will not yield any more indications within the environmental management or environmental management systems framework or operations.

Audit Program and Verification Statement

A general company audit program does not reveal details about audits performed within environmental management and performance or the environmental review process, except indicate that auditing is considered an important aspect in the company operations. Wateringen looks at if the companies address the issue of auditing (referred to as auditing program) and a form of verification/assurance statement (referred to as verification statement) within their first report and the latest report, splitting the companies into early reporters and late reporters. Therefore, this study will look into whether companies address auditing (audit program) and have some form of verification/assurance statement (verification statement). To have comparable data, this paper uses the same categories (audit program and verification statement) and the same definition of the categories that Wateringen used. Yet, instead of two time periods, it explores the environmental reports in three time periods: the first reports, the middle reports (referred by Wateringen as latest versions) and the most recent reports. Also, there is a slight modification that the companies looked at will not be sorted into early reporters and late reporters.

2.4.13. Environmental Performance Indicators:

Common Company and Industry-wide progress

Environmental performance indicators are important for a company in order to evaluate their current performance and be able to benchmark it against their target performance. The environmental performance indicators that a company chooses are the areas that the company deems important in monitoring, evaluating and reviewing their performance and progress on. The results of this monitoring, data compilation, evaluation and review are that these influence the direction of future corporate policies and plans.

Instead of including all the different indicators a company uses, within the research conducted by Wateringen the focus was on two categories: number of indicators used and types of indicators. The numbers of indicators are split into possible four types: atmospheric (A), aquatic (Q) or terrestrial (T) or a combination of impacts or influences on the environment. The types of indicators used are split as well into four possibilities: absolute figures (F), over the years comparison (C) or targets (T) or a combination of those. Both early issues and latest issues of performance indicators are sorted into categories of whether these companies were early reporters or late reporters.

Wateringen"s research methodology here was somewhat vague and does not provide the entire layout of all the environmental performance indicators a company uses. However, companies use many environmental indicators and classify these indicators differently within categories. Therefore, this is a simpler approach of comparing the scope of the indicators within companies. While ideally for this study it would have been preferable to readdress this section in order to include all the different indicators companies used, currently many of the early environmental reports issued cannot be found. Thus, in order to have comparative data, the methodology of number of indicators has to be maintained. But, instead of looking at two time periods it will investigate the environmental performance indicators in three time periods: the first reports, the middle reports (referred by Wateringen as latest versions) and the most recent reports. Also, there is a slight modification that the companies looked at are not sorted into early reporters and late reporters. This approach and method of findings for environmental performance indicators is maintained for both common company progress and industry-wide progress.

3. Analysis

In this section the collected data from the findings will be quantified, categorized and compared for time trend purposes. The early findings from Wateringens study is put in context with the current findings of this paper and compared to determine a process of change within the EMS frameworks in the oil industry. As a further reference, charts and tables can be found in the Appendix where they are numerically aligned with the headings in this section.

3.1. Company Profiles

The analysis of company profiles establishes the biggest category groups (medium), percentages, range, average (mean) and the mode for the findings. When looking at the medium of groups the study has included the undisclosed findings within the total calculation. As undisclosed information about a company states something about it and its transparency, for this reason it was incorporated into the medium calculation results. However, the range, average, and mode could not have been calculated considering the undisclosed group. Therefore, the undisclosed category was not included within these three different calculations.

3.1.1. Location

For the purpose of this research, the location is split off into seven areas, Africa, Asia, Eurasia, Europe, Middle East, North America and South America. The region with the most numerous amounts of the biggest oil companies is the Middle East that have each 6 of the 24 companies. The regions with the least amounts of companies are tied with both Africa and South America having just 2 of the 25 companies each. The location of those companies focused within this study is comprised of 8% in Africa, 8% in South America, 12% in Asia, 12 % in Eurasia, 16% in North America, 20% in Europe and 24% in the Middle-East. The average could not be conducted for location, as location is not have a numerical value. For the mode, regions were placed in an alphabetical order resulting with Europe.

3.1.2. Ownership

The results show most of the companies (11 out of 25) are wholly-state owned, while the second largest category is no major owner with 8 companies, leaving-majority state owned companies in the smallest category being only 6 of the 25 companies. However, when looking at what majority and wholly state owned as one category it would mean that 17 of 25 companies are majority or wholly government owned. Looking at it from a percentage perspective 44% of the companies are wholly-government owned, 32% of the companies have no major owner, while 24% of the companies are majority government owned. Two-thirds (68%) of the companies are majority or wholly-government owned. The average could not be conducted for location, as location is not have a numerical value. For the mode, ownership is placed within the following order no major owner, majority owned by the state and wholly state-owned. Thus the mode findings for ownership resulted with majority owned by the state.

3.1.3. Founded

From the information gathered it was found that 1961-1990 was the period that had the most company foundations with the total of 11 companies being founded within this period. This is a significant difference from the other categories as the rest of the periods of company foundation have results that are closer together. Apart from the undisclosed category (that has only one company not disclosing their founding information), the is from 1870-1900 with only two companies being founded. Almost half of the companies

(42%) were founded within the period from 1961-1990. 19% were founded from 19-09-1930, 15% from 1931- 1960, 12% from 1991-2013, only 8% from 1870-1900 and 4% was undisclosed. If this is split into two categories early founders (up until and including 1960) and late founders (from 1961) the results are rather similar. Slightly over half of the companies 54% are late founders and slightly below half of the companies 42% are early founders.

3.1.4.Revenues

The group revenue that has the most companies is 100.001-150 million with six companies. The group revenue with the least amount of companies is tied with three groups the 250.001- 300 million, 300.001-350 million and undisclosed with no companies earning this amount. As noted, information for four companies happens to be undisclosed. 24% of the companies earn between 100.001-150 million, next is tied by two different revenue groups (50-100 million and 200.001-250 million) each with 16% of the companies, followed by 12% of the companies earning 350.001-400 million and ultimately two revenue groups (150.001- 200 million and over 400 million) are tied in the last place with each having 8% of the companies. While the overall distribution per category may give the impression that the revenues are distributed closely together (24%, 16%, 16%, 16% 12%, 8%, 8%, 0%, 0%). However, if we merge the revenues into two categories (having one category up to 250 million and one including everything after 250.001 million) the results show that the majority (64%) of companies earn up to 250 million while only 20% earn above 250.001 million.

3.1.5.Public/Private

The majority of the companies, 14 to be precise are publicly traded companies. However, this is not by a significant margin, as 11 of the companies are private. This means that 56% of the companies are publicly traded and 44% of them are private.

3.1.6.Multinational

Information on how multinational a company's operations are was only encountered for 14 out of 25 the companies, leaving 11 companies with undisclosed/unaccounted information. From the 14 companies that information was found, the minority 2 mainly operate only within their national borders, one company operates in 10-19 countries, one operates in 20-29 countries, four in 30-39 countries two in 40-49 countries, 0 for both 50-59 counties and 60-69 countries, 1 for 70-79 countries, one for 80-89 countries and two in 90 or more countries. The number of companies per category seems to stand out only with the 30-39 category that contains four companies, however the general spread over the rest of the companies varies between 0, 1 and 2, thereby making the distribution across the board similar. In addition, at least of 12 companies (48%) have operations in over 10 countries, with at least 4 companies (16%) having operations in over 70 countries.

3.1.7.Employees

For almost all of the companies, except for three, information regarding the number of employees was found. The results range from approximately between 5,000-10,000 employees in one company to another having 690,000 employees. The results are very varied, and resulted the biggest amount of companies (7) having over 100,001 employees, the second largest category was from 80,001-100,000 employees with 5 companies, the next three categories with three companies each are the undisclosed category, the 0-20,000 employees, and the 40,001- 60,000 employees and the least amount of companies per category were found 20 for 20,001- 40,000 employees and 60,001-80,000 employees. This means that 28% of the companies have over 100,001 employees, 20% have 80,001-100,000 employees with 5 companies, 12% of the companies

can be found within the undisclosed category, the 0-20,000 employees and 40,001- 60,000 employees and the least percentage 8% of the companies were in the 20,001-40,000 employees and 60,001-80,000 employees. These results can be categorizing even further having 0-40,000 as low employing companies, 40,001-80,000 as medium employing companies and ultimately over 80,001 as high employing companies. This would result in 12 (48%) companies being high employing companies, while the remaining 10 companies with disclosed information are equally distributed 5 (20%) being low employing companies and 5 (20%) being medium employing companies.

3.1.8.Profit

The company profits in terms of millions range from -7.358 million to 44.460 million dollars. The largest profit groups with the largest amount of companies is tied with the undisclosed group and the group that earns between 10.001-20.000 million dollars each having 6 or 24% of the companies. This is followed by the group that earns from 0-10.000 million dollars with 5 or 20% of the companies, 4 or 16% of the companies earning 20.001-30.000 million dollars, 3 or 12% of the companies that earn over 30.001 million and ultimately the smallest group that has one company or four percent that earns a negative profit.

3.1.9.Production

The oil production according to Forbes (million barrels/day) ranges from 12.5 to 1.4 million barrels per day. The production group with that contains the most companies is 2-2.9 million barrels per day production with 11 or 44% of the companies, then following is tied with three categories, the 1-1.9, 3.9 and the over 5 million barrels per day production with 4 or 16% of the companies each, and the smallest group contains just 2 or 8 % of the companies. In addition 60% of the companies product 2.9 million or less barrels per day and 40% product 3 million or more barrels per day.

3.1.10. Fortune 500 Rank

The 25 biggest oil companies range from 1 to 137 on the Fortune 500 list. However, the biggest category with 9 or 36% of the companies is not included into the Fortune 500 rankings. The second biggest category has 7 or 28% of the companies is ranked within the first ten. The smallest category is that with one company or 4% within 21-30 rankings group. However, please note that the last three companies rank is not within a close range: 49, 68 and 137.

3.2. Structure

The structure part of the analysis will apply the statistical findings in order to understand how EMS is structured industry-wide. Percentages will be used to give an indication of the scale of each considered factor.

3.2.1.Do the Companies have EMS?

The 25 company findings if companies currently reference to environmental management systems reveal that the biggest percentage 92% of refer to management systems, while 8% make no such reference. An observation was made that the latter percentages of companies happens to come from the same geographical region (Middle East).

3.2.2. Year EMS was Introduced

The year of companies introducing their EMS ranges from 1992-2011. For this some of the EMS years were estimates based on information of when the company EMS's was last referenced. However, for 16% of the companies the EMS year of introduction was not found, nor was enough information discovered in order to provide an estimate. The greatest number of EMS's is introduced in between 1996-2000, while the lowest number was of EMS's is 4% introduced in 2011 or thereafter. In addition, 16% of the companies introduced EMS's in 1991-1995, another 16% in 2001-2006 and 8% in 2006-2010. What can be seen is that within the more recent years/as of 2006 introduction of EMS"s is at a lower percentage (4% and 8%).

3.2.3. EMS Title

The findings for the EMS title illustrate that the majority 56% of the companies title their EMS as an HSE management system. This includes Eni"s (Integrated Health, Safety and Environment (HSE) Management System) and Pemex (Pemex-SSPA System) title that were slight variations. Furthermore, 12% use EMS and a modification of the title Operating Management System. Ultimately, 8% use the title integrated system in different ways, while only 4% label their EMS sustainability management system. However, 8% of the companies make no reference to EMS. An observation is that one of the companies Statoil had three reference titles for their EMS (Sustainability management system & Statoil's management system & total management system), however this author for no particular reason chose Sustainability MS the one to use for calculation (changing the name would not yield different findings as Statoil"s EMS title did not fit into any other category and hence would have to be a separate category no matter the title used).

3.2.4. Is the Company EMS integrated?

Of the 25 companies, 80% reference having an integrated EMS system, while 12% reference having only an EMS system, and 8% could not be found to make reference to any form type of environmental management system.

3.2.5. Company EMS Integration Components

Looking at the components of EMS and the integrated EMS systems, the findings show that 59% of the companies (more than half) have health, safety and environment as the components of their integrated management system. This is followed by 13% of the companies that have only EMS"s, and 8% of the companies that do not reference EMS. There are 5 different combinations of integrated management system components with 4% each: Safety, Security, Health, Environmental and Social Risks; Health, Safety, Security, Environment and Operation Risks; Health, Safety, Security, Environment (HSSE) and Social Performance (SP); Process Safety, Personal Safety & Health, Environment, Reliability and Efficiency; and Health, Safety and Environment(HSE); Ethics; Corporate Social Responsibility; People; Communication Risk Management; Finance and Control; Procurement; Managing Information. However, within Rosneft"s website reference of their HSE management system and their sustainability report there is some differences, the sustainability report referenced the system as an HSE system while the website description referenced it as integrated management system for industrial and occupational safety and environmental protection. It is also observed that Statoil is the only company that could be found to reference HSE management system is an integrated part of our total management system, with their management system having numerous different components to it (Health, Safety and Environment (HSE); Ethics; Corporate Social Responsibility; People; Communication Risk Management; Finance and Control; Procurement; Managing Information).

3.2.6. Scope of Company EMS

The findings for the scope of the company EMS system are that the largest percent of companies 60% had a group wide EMS, following up with 24% of the companies for which reference to their EMS scope could not be found. In addition, ems scope included subsidiaries by 16% and contractors by another 16%. The lowest percentage of scope references found was 4% for the following categories: Company owned and operated; Corporate office; Group- Wide and subsidiaries within Mexico; No corporate management system, implemented on an individual business level; some subsidiaries; to Joint Ventures with Operation Control; and Affiliates. However, for the following terms were grouped under group-wide: group, corporate, all business segments, all corporate areas, all company operations, and all operating organizations. For more specificity on the common company scopes please refer to the annex.

3.2.7. Use of Standards

The findings show that 72% of the companies use ISO 14001 standards, while 28% do not. EMAS and BS 8850 are each individually used by 4% of the companies, while none of the companies use BS 7750. In comparison ISO is used 68% more often the both EMAS and BS 8850, while 72% more than BS 7750.

3.2.8. Certification of Corporate EMS

Addressing if corporate EMS"s frameworks are ISO 14001 certified, compatible but not certified or not certified the findings show that the range of possible responses are not sorted. For the category of compatible and certified the range of possible responses is no reference, unclear, corporate unclear but some operations are ISO 14001 certified, no corporate certification but some subsidiaries/operations are, not certified and certified. The findings show that from the information encountered, 16% of the companies corporate EMS are ISO 14001 compatible and certified, 20% were not compatible and certified, 16% had no reference, 44% had corporate EMS that were compatible with ISO 14001 but not certified and 20% were unclear/undeterminable.

3.2.9. Type of EMS Design

The type of EMS design ranges from standardized design system, self-designed or tailored design, self-design that is compatible with standards, no corporate EMS/HSE MS, unknown/undeterminable and no reference found. These findings show that the largest percentage of companies 52% have self-designed EMS systems that are compatible with standards, the smallest percentage of companies is tied with 4% having a standardized design system and another 4% having no corporate EMS/HSE MS. In addition, 8% of the companies had a not compatible self-design or tailored design. However, for 24% of the company's reference could not be found, and 8% of the companies were unknown or unable to be determined for. 3.2.10 Use of Guidelines for Company EMS These findings illustrate what guiding documents companies use or refer to in regards to EMS. The highest percentage of companies (88%) did use or refer to international standards in regards to their EMS. Then followed by the use of national standards found with 52% of the companies and IPIECA's "A common Industry Approach to Global Standards" that 52% of the companies have made use of.

The standards with the lowest percentage of use (0%) are GEMI, APPEA's Code of Environmental Practice, American Chemistry Council (ACC) Responsible care (RC 14001 or RCMS), and Natural Gas

Companies in Latin America and the Caribbean (ARPEL) guidelines for the oil and gas industry in Latin America and the Caribbean. The APIs Model Environmental, Health and Safety (EHS) Management System and Guidance Document is used by 28% of the companies, the OGP's Guidelines for the Development and Application of Health Safety and Environmental Management Systems is used by 20% and the American Petroleum Institute Model EHS Management System and Recommended Practice 75 that is used by 4%.

3.2.10. Company EMS Key Elements

For 56% of the companies information was not found regarding if they have key elements and what those key elements are, while for 44% of the companies this information could not be attained. The 44% of the companies that information was encountered are used to see how many elements and what the structure of those elements do the companies have. The EMS elements category also included EMS control framework model areas as elements. The average number of elements was 8.1, the mode is 4, 8 and 11 individually having 20% of the company number of elements and the medium is 8. The rest of the numbers of element (3, 7, 10 and 15) each have 10%. The structure of the company EMS was split into 5 categories (that were established on the commonalities of the findings): elements, elements with requirements, element systems with sub elements, element systems that had one element as a base followed by additional elements and then proceeded by sub elements, and control frameworks with different areas. The findings resulted that the largest percentage (40%) of companies had just elements. Then 20% of the companies had elements with requirements and another 20% had control frameworks with different sub-areas. Finally, 20% of the companies had element systems with additional sub-element systems.

3.3. Content

3.3.1. Documents

3.3.1.1.   Environmental Policy

Just over half (52%) of the 25 largest oil companies possess and have disclosed their environmental policies. The biggest percentage of the companies, 36% aim at legal compliance, 4% aim at above legal compliance, 16% aim at best practice standards and 8% had environmental policies but do not refer to legislation or standards. From the 36% of the companies that aimed at legal compliance, 4% for the legal compliance do not include environmental legislation. In addition, 12 % of all the companies have references to both legal compliance and best practice standards. Only 20% of the companies referenced responsibility: 16% of all companies refer to responsibility upon all or each individual employee, while 4% refer to the responsibility delegated on the managerial level. 32% of the companies mentioned that the policies are integrated and applied to their corporate group, while 0% mentioned about decentralization of their policies. 48% of the companies have mentioned EMS (continuous or systematic included), thus only 4% do not make such reference.

3.3.1.2.   Strategy

The findings illustrate that 24% of the company's reference aim for legal compliance, 16% reference aim for best practice standards and none (0%) reference above legal compliance. There is the observation that from those that reference best practice, 4% of the company's reference standards in regards to ethical

standards and another 4% reference standards in regards to their own company standards. It should also be taken into consideration that 36% of the companies do not disclose any forms of strategy, while 64% do. Furthermore, none (0%) of the company's reference or delegate responsibility within their company strategies. The company strategies do in 36% of the cases reference centralization (application to entire corporate group), however 0% of the time they refer to decentralization. The findings also demonstrate that EMS is referenced within 24% of the strategy documents.

3.3.1.3.   Environmental Targets:

The findings show that 80% of the companies do not refer to environmental targets. Out of the remaining 20%, 4% is delegated to individual businesses, 4% have under environmental objectives and targets just objectives, 4% have targets for their sustainability commitments and 4% have just their climate targets for this year. Thus, only 8% (4% that disclose their environmental program and additional 4% that have decentralized their program) disclose their environmental targets, these however do not reference legal compliance, standards, or responsibility, however, the targets are centralized and do reference EMS.

3.3.1.4.   Environmental Management Plans:

The findings show that 32% of the companies disclose their environmental management plans or some form of management plan. Companies that refer to standards or legal compliance are 12%: 4% referencing legal compliance and 8% reference best practice standards (of which 4% refers to enhancing sustainable the company's development standard). None (0%) of the companies' reference responsibility or the centralization or decentralization of their management plan. However, 16% refer to EMS (this includes, systematic, consistent standards, standardized and continuous), thus half of the companies that disclose some form of management plan also reference EMS.

3.3.1.5.   Principles:

The findings demonstrate that environmental principles are not disclosed for 36%, while for 64% they are. 16% of the companies referenced for legal compliance, 0% for above legal compliance and 16% referenced best practices. Looking at those that referenced standards and compliances, it is observed that 12% of all companies referenced both achieving legal compliance and best practice standards. Responsibility is referenced 16% of the time but only in regards to that all or every individual employee is responsible, while managerial and board responsibility are not referenced. Centralization of the management plan is referred to by 28% of the companies, while 0% referenced decentralization. Ultimately, 20% of the companies referenced EMS systems.

3.3.1.6.   Environmental Objectives:

64% of the companies do not disclose environmental objectives, 36% of the companies do disclose corporate environmental objectives. Of all the companies only 4% reference compliance with legislation, 4% refer to centralization, 4% reference decentralization and 12% refer to EMS. None (0%) of the companies' reference responsibility on any level, or compliance above legislation or compliance with best practices.

3.3.1.7.   Environmental Programs:

Only 8% companies reference their general environmental programs, while 92% do not. Of which, 4% reference centralization, 4% reference aiming for legal compliance and 4% reference EMS. None (0%) of

the companies' reference responsibility on any level, decentralization, or compliance above legislation or compliance with best practices. The main finding is that it is not common to reference general environmental programs.

3.3.2. Frequency of documents referencing particular issues:

3.3.2.1. Reference to legal compliance

Reference to legal compliance by the framework documents occurred (%referenced/%disclosed documents) 36%/52%, 24%/64%, 0%/8%, 4%/32%, 16%/64, 4%/36%/ and 4%/8%. The range of reference per document is from 0% to 69.2%. Specifically, 69.2% of the disclosed environmental policies, 37.5% of the disclosed strategy documents 0% of the targets, 12% of the environmental management plans, 25% of the principles, 11% of the objectives and 50% of the programs referenced legal compliance aims. Only environmental policies are found have more than 50% reference to legal compliance, while strategy documents least reference legal compliance with 0%.

3.3.2.2. Reference to above legal compliance

Reference to above legal compliance occurred only once with 4% within the environmental policy documents.

3.3.2.3. Reference to best practices

Reference to best practices or international standards were made by (%referenced/%disclosed documents) 16%/52%, 16%/64%, 0/8%, 8%/32%, 16%/64%, 0%/8% and 0%/36%. This resulted in best practices and international standards being referenced 30.7% in environmental policies, 25% in strategies, 0% in environmental targets, 25% in environmental management plans, 25% in principles, 0% in environmental objectives and 0% in environmental programs. None of the documents referenced best standards over 50%. Specifically, the highest level of reference to best practices is within environmental polices is with 30% and the lowest is in environmental targets, environmental objectives and environmental programs with 0%.

3.3.2.4. Reference to responsibility- board level

Reference to responsibility on the board level occurred 0%/52%, 0%/64%, 0%/8%, 0%/32%, 0%/64%, 0%/36%, 0%/8%. Therefore, none of the documents refer to placing responsibility on the board.

3.3.2.5. Reference to responsibility- managerial level

Reference within the document on responsibility to the managerial level occurred 4%/52%, 0%/64%, 0%/8%, 0%/32%, 0%/64%, 0%/36% and 0%/8%. Thus, responsibility to the managerial level occurred is referenced by 4% of the companies within the environmental policies and 0% within all other documents.

3.3.2.6. Reference to responsibility- all employees

Reference to responsibility on all or every individual employee is referred to 16%/52%, 0%/64%, 0%/8%, 0%/32%, 16%/64%, 0%/36% and 0%/8%. This results in responsibility on all or every individual employee being referenced 30.8% in environmental policies, 0% in strategies, 0% in environmental targets, 20% in environmental management plans, 25% in principles, 0% in environmental objectives and 0% in environmental programs. Therefore, responsibility on all or every individual employee is referenced within two categories with similar findings: environmental policies 30.8% compared to environmental principles

25%. Company strategies, environmental targets, environmental management plans, environmental objectives and environmental programs have not made any reference.

3.3.2.7. Reference to centralization

Reference to centralization is 32%/52%, 36%/64%, 4%/8%, 0%/32%, 38%/64%, 4%/36% and 4%/8%. This means that referencing of centralization from disclosed documents occurs within 61.5% of the environmental policies, 56.3% of the strategies, 50% of the targets, 0% of the environmental management plans, 43.8% of the principles, 11.1% of the objectives and 50% of the environmental programs. From the disclosed company documents that have the highest reference to centralization are environmental policies with 61.5%, while strategies, targets environmental programs all have 50% and above. The documents with the lowest amount of reference to centralization are environmental management plans with 0%.

3.3.2.8. Reference to decentralization

Reference to decentralization occurs 0%/52%, 0%/64%, 4%/8%, 0%/32%, 0%/64%, 4%/36% and 0%/8%. As a result, referencing of decentralization from the disclosed documents occurs 0% of the environmental policies, 0% of the strategies, 50% of the targets, 0% of the environmental management plans, 0% of the principles, 11.1% of the objectives and 0% of the environmental programs. Therefore, there are only two documents environmental targets and environmental objectives that refer to decentralization. From the highest percentage of referencing of decentralization within the disclosed documents within environmental targets 50%, the lowest amount occurs within environmental policies, strategies, environmental management plans, principles and environmental programs with 0%.

3.3.2.9. Reference to EMS

In addition, from the disclosed documents that reference environmental management systems are 48%/52%, 24%/64%, 4%/8%, 16%/32%, 20%/64%, 12%/36% and 4%/8%. Consequently, from the disclosed documents referencing to EMS occurs 92.3% in environmental policies, 37.5% in strategies, 50% in environmental targets, 50% in environmental management plans, 31.3% in principles, 33.3% in environmental objectives and 50% in environmental programs. Ultimately, from the disclosed documents (environmental policies, environmental programs, environmental targets, and environmental management plans) four companies reference EMS 50% or more. While, below 50% referencing occurs in three of the disclosed documents (strategies, principles and environmental objectives), however still all three documents reference EMS above 25%.

3.4. Time Trends Analysis

3.4.1. Codes of Conduct: Titles and dates of adoption

3.4.1.1. Current Code of Conduct reference and disclosure

This section will address firstly how many of all the 25 companies that currently have referenced their code of conduct, and how many have actually disclosed them. When looking for codes of conduct for the 25 companies researched in this study, some level of referencing was found for 80% of the companies. However, for 20% of the companies no referencing or information was found regarding any form of company code of conduct. Furthermore, for an additional 4% of the companies there was no further information regarding except that it was referenced. What was discovered was that all the companies that

had provide some level of information apart from just referencing their codes of conduct, had also released their entire codes of conduct to the public and all those that only referenced or had not even referenced a code of conduct did not disclose them. This could imply that there is no middle ground when it comes to code of conduct disclosure; either they are entirely disclosed or they are kept entirely private.

3.4.1.2. Code of Conducts – dates of adoption

Next, the dates of adoption of the company codes of conduct will be analyzed within three different time periods: the first period (introduction), the middle/other period („other" refers to the inbetween revisions), and the latest period (latest revision). Each of these time periods will be addressed first for the common companies, and then for the 25 companies, followed by a comparative analysis between them.

3.4.1.2.1 Codes of Conducts: Common Companies- dates of adoption

3.4.1.2.1.1 First Code of Conducts

For the common companies there is a range of 27 years between companies for the date of incorporation, with Shell being the first to introduce their Statement of General Business Principles in 1976 and Pemex being the last to introduce their codigo de conducta in 2003 (this is an estimate). 1996, 1998, and 2000 are all ranked the year within which the most companies (2 from the current list) introduced their codes of conduct. The average year for the introduction of the code of conduct is 1996.3, rounded to 1996 and the middle year is 1998.

3.4.1.2.1.2 Other/Middle Modifications of Code of Conducts

This paper also looked at if in between these dates companies modified their codes of conduct. The other revisions were conducted between the first and latest codes of conduct range from 1997 to 2010. However, within this information five of the companies did not disclose and in addition it was found that for two of the companies' revisions were made two additional times between their first codes of conduct and their latest versions. The middle year for making these modifications is 2007. The year with the most revisions is tied between with both 2006 and 2010 having the most companies (2 or 20%) modify their codes of conduct. The years with the lowest amount of modifications were between 1998 and 2005 in addition to 2009, where no revisions were made. However, three years 2006-2008 account for the majority of the revisions conducted.

3.4.1.2.1.3 Latest Code of Conducts

The latest dates of adoption range from 2007-2013. However, one company (Petrobras) most recent code of conduct remains undisclosed. The average year is 2011 and the middle year is 2012. If the latest code of conduct year of adoption is split into yearly categories, the year with the most updated codes of conduct is 2012 with 5 companies. Then 2007, 2010, 2011, 2012, and 2013 each have one company adopted a new version of their codes of conduct. However, in 2008 and 2009 no new codes of conduct were released. What stands out is that 80% (8) companies updated their codes of conduct from 2010 within a 4-year span.

3.4.1.2.2 Codes of Conduct: Industry- Wide Companies- dates of adoption

3.4.1.2.2.1 First Code of Conducts

When looking at all the 25 Forbes list companies the findings change slightly. What is found is that the span of the range is 24 years and the range of years of the first codes of conduct is from 1976 to 2010, (it is possible even 2012 as it is unknown if Gazprom had a code of conduct previous to the current one). In addition, what was found was that for almost the majority of the companies it was difficult uncovering the

date of the first code of conduct. The years with the most companies who introduced their codes of conduct were 2000 and 2008 without Wateringens estimates (with estimates 1996, 1998, 2000 and 2008). If the dates of adoption are sorted into four categories: No reference, before 1990"s, 1991-2000 and 2001- 2010. What is found is that for the largest percentage of the company's 64% (without Wateringens estimates, 44% with Wateringens estimates) this information cannot be found. For the remaining companies (with and without the inclusion of Wateringens estimates) apart from the one outlier (Before the 1990's), the remaining companies are fairly evenly distributed between the two remaining groups: 1991-2000 and 2001-2010. The average year for the 25 companies of the introduction of the code of conduct is 1999.5, rounded to 2000 and the middle year is 2000.

3.4.1.2.2.2 Other/Middle Modifications of Code of Conduct

For the 25 companies the other revision for the code of conduct range from 1997-2012, in addition to those that have no code of conduct and have not referenced such information. When looking at the 25 companies code of conduct modification date what stands out is that 50% of the companies do not disclose or reference this information. The year with the most revisions was 2006 and 2010 with each 11% of the companies. The year with the least amount of company revisions was tied including 1998-2005 and 2009. From the companies that have had revisions and disclosed their revised date the average year is 2007.5 rounded to 2008 and the middle year 2007.5 also rounded to 2008. While, most of the companies that have had revisions and disclosed their date of revision have done so after 2006, there does not seem to be a peak period within this time frame.

3.4.1.2.2.3 Latest Code of Conducts

Of all the companies 36% had no reference to any revision of the latest Code of Conduct. On the opposite side, 36% referenced that they did revise their Code of Conduct in 2012. In between these two dominant percentages, the rest of the industry-wide companies had revisions in respectively 2002, 2007, 2008, 2011 (accounting for 4% each) and 2010 (6%). This points to a reasonably active update among many of the companies, but also shows an equal share of companies that are not that active in updating their Code of Conducts.

3.4.1.2.3 Comparison of Code of Conducts- dates of adoption

For the first code of conducts, when the common companies and the industry-wide companies are compared, there is an increase in the range of years between the different companies' code of incorporation from 27 to 34, the average year also increased from 1996 to 2000 and the middle year increased from 1998 to 2000. In addition, the companies where this information could not be found increased from 50% to 64%; from the 10 companies in study to the 25 companies within this study. Both wateringen and this author had difficulty finding 50% of the first code of conduct adoption dates, therefore Wateringens estimates were used.

When comparing the latest code of conduct revision for both the common and the industrywide companies it seems clear the 2012 is the year where most companies revised their Code of Conducts. Further, there is a very short time between the revision years, indicating that updates are more frequent for the latest codes than for the first codes.

3.4.1.3.   Titles in Code of Conducts

The titles of the codes of conduct will address the first period for the common companies only due to the difficulty of finding old code of conduct data in regards to the titles. Then the latest revised code of conduct titles will be addressed for all of the 25 companies. Ultimately there will be a comparison between the findings to see how the titles for the industry-wide code of conducts have changed within the different time periods.

3.4.1.3.1 Code of Conducts: Common Companies- titles

3.4.1.3.1.1 First Code of Conducts

For the common companies, the first codes of conduct averages were; 50% used code, 20% used ethics, 40% used conduct, 40% used business and only 10% used the companies own name. This shows that there has been a 22% increase in the use of code, 24% increase the use of ethics, 8% increase in the use of conduct, 18% increase in the company's use of its own name, and a 16% decrease in the use of business.

3.4.1.3.2 Code of Conducts: Industry-Wide Companies- Titles

3.4.1.3.2.1 Latest Code of Conducts Looking at the code of conduct titles of the 25 companies' codes of conduct what was the word used by most of the companies with 72% was Code. Then followed by Conduct that is used in the title of 48% of the companies, next is ethics that is used by 44% of the companies, the companies own name used by 28% of the companies and ultimately, with 24% is business.

3.4.1.3.2.1.1 Observations

By looking at the documents, more often than not called "Code of Ethics", it seems clear that the companies choose to either separate the code of conduct from the code of business ethics, or they include code of conduct *in* the code of ethics. For instance, Petrobras document is called "Code of Ethics", but it also contains a specification of "Business Conduct". Statoil is one of the companies that divide the subsections in the document (Ethics: Code of Conduct) according to business practice and personal practice. A similar approach can be seen in ConocoPhillips document "Code of Business Ethics and Conduct". The document is conjoint and use subsections to address basically the same as Statoil; internal relationships with workers, relationships with external partners, confidentiality, combating bribery and illegal activities with money, and respect for human rights and co-workers. Petrobras is one company that chooses to have two separate documents for their employees. "Petrobras Code of Best Practices" is the document guiding senior management and the "Code of Ethics" guides the rest of the employees and Petrobras as an institution. This approach seems relatively common in most of the companies; addressing both personal behavior and how the company as an actor shall behave. This is done either by separating the documents or to have clear distinctions in the documents.

3.4.1.3.3 Comparison of Codes of Conducts- titles

There were several differences encountered within the comparison between the Wateringens companies for the industry's first codes of conduct titles and these studies latest codes of conduct titles. In comparison with the Wateringens companies, these studies latest codes of conduct the findings were similar. Wateringen's company selections resulted with 90% using code, 50% using Ethics, 80% using Conduct, 60% using Business and 20% using the companies own name within its Code of Conduct title. The Forbes

companies list was similar resulting with 72% using code, 48% using conduct, 44% using ethics, 28% using the companies own name and 24% using business for the code of conduct title.

3.4.2.Code of Conduct:

Overview of environmental specificity in oil industry's codes of conduct. The first codes of conduct and the latest codes of conduct will be compared in this section, specifically addressing the referencing of the following issues: environmental policies, management systems and sustainable development.

3.4.2.1.   Code of Conducts: Environmental Policy

First there will be a comparison of the individual common companies first code of conduct and their latest code of conduct in regards to mentioning their environmental policy within their codes of conduct. This will be followed up by an analysis of the overall common company's comparison. Furthermore, this section will look at the analysis of overall findings within the industry-wide progress. Ultimately, to compare the analysis of the first codes of conduct of the common companies to the latest codes of conduct of the industry companies.

3.4.2.1.1 Code of Conducts: Common Companies- environmental policy

3.4.2.1.1.1 First Individual Code of Conducts vs. Latest Individual Code of Conducts

Looking specifically at what the modifications environmental policy within the codes of conduct the findings were fairly evenly spread out. Two companies had essentially different codes of conduct, three companies had similar wording and essence yet they were still different, three companies had the same wording and more used within the same sentence, and ultimately two had included the same policy and commitment as referenced originally, however there were additional commitments too.

However, it is probable that Wateringen cut down some of the original statements, therefore the same and more categories could be instead same, while the different and same category could be due to the fact that the Wateringen and this author considered different statements to be of more importance. As the statements are probably shorter than within the codes of conduct it was not possible to do a comparison of the wording between the codes of conduct. Or it would be possible that some of the things that are in the current policy references could have been stated previous, but were just not demonstrated in Wateringens paper. In addition, the statements that this author has selected as the company's environmental policy might not be deemed to be the entirety or the extent of their policy, or other statements might be considered by others more appropriate. For these numerous reasons this paper will not address a wording analysis of the environmental policy statement within the codes of conduct.

Nevertheless, there were some observations made for example Shell's first code of conduct referred to environmental matters as any other critical business activity, yet Petrobras prioritizes health, safety and environmental protection issues. Within, the latest codes of conduct ExxonMobil places running safe and environmentally responsible operations, above all their other objectives. In addition, a wider range of social issues seems to be addressed within the latest codes of conduct: environment, health, safety, security, human rights, transparency, integrity and community (however, this could not be confirmed as the first codes of conduct were no longer available).

3.4.2.1.1.2 First Overall Code of Conducts vs. Latest Overall Code of Conducts

In regards, to referencing of environmental policy (strategy) within their first codes of conducts all (100%) of the companies had some form of reference. However, with the most recent codes of conduct all but one company (Statoil) (90%) refer to their environmental policy (strategy).

3.4.2.1.2 Code of Conducts: Industry-Wide Companies- environmental policy

3.4.2.1.2.1 First Overall Code of Conducts vs. Latest Overall Code of Conducts

In regards, to referencing of environmental policy (strategy) within the industry's first codes of conducts all (100%) of the companies had some form of reference. However, with the most recent codes of conduct the findings resulted with 68% of the companies having environmental policy statements, 8% not making such references and 24% that did not disclose or reference their codes of conduct. If the companies that did not disclose their codes of conduct are removed then the results would 89% of the codes of conduct referencing environmental policy statements and 11% that do not.

3.4.2.1.3 Comparison of Code of Conducts- environmental policy

The statements that this author has selected as the company's environmental policy statement might not be deemed to be the entirety or the extent of their policy, or alternative statements might be considered more appropriate by others. Therefore, instead of having an environmental policy statement analysis from the code of conduct, this paper will just demonstrate the current environmental policy statements its selected from the codes of conduct alongside the first code of conduct environmental policy statements from Wageningen's paper. This will give a sense of the current state of these environmental policies in comparison with the previous ones without the risk of making misguiding statements.

3.4.2.1.3.1.1 Observations Within, the most recent codes of conduct in addition to ExxonMobil that places running safe and environmentally responsible operations, above all their other objectives, Sinopec uses the words "dedicated to its greatest possible limit to eliminate accident, uproot harms on human health and eradicate detrimental effects on the environment" and Rosneft places as one of its the company priorities environmental protection.

3.4.2.2 Codes of Conduct: Management Systems

This section will firstly look into the first code of conducts common companies' overall reference to management systems, then it will break down the terms referenced to see what the common practice is. Followed by looking into the latest code of conducts of the common companies' overall reference to management systems and an additional break down of the terms referenced. Proceeded by the industry's overall reference to management systems with a breakdown of the particular terms used. Ultimately, there will be a comparison between the first code of conduct analysis and the latest code of conduct analysis (industry results will be used).

3.4.2.2.1 Codes of Conduct: Common Companies- management systems

3.4.2.2.2 First Code of Conducts

Management systems can be referred to as a systematic approach, continuous improvement, in addition internal standards might refer to them, just as standards have. Therefore, for the company's codes of

conducts referencing of a management system was not restricted to just those two words but however was split into different reference ways/extents of reference: continuous, systematic, management system, according to standards, program and internal controls and continuous and systematic, in addition, there will be the option of not found. Looking at the first codes of conduct to see if they reference management systems resulted with 50% of the codes of conduct having no reference to management systems. What resulted was that none of the companies referred to either program and internal controls and continuous and systematic, 10% of the companies reference continuous, 10% reference systematic, 10% reference management system and 20% reference according to standards.

3.4.2.2.3 Latest Code of Conducts

Looking at the latest codes of conduct, 70% reference management systems, of which the majority 30% reference directly management systems. Only 20% have no reference to management systems in any manner, while another 20% reference continuous. In addition, 20% reference programs and internal controls and another 10 percent reference both continuous and systematic. Yet, none of the companies referenced systematic or according to standards.

3.4.2.2.4 Codes of Conduct: Industry-Wide Companies- management systems

3.4.2.2.4.1 Latest Code of Conducts

Looking at the first codes of conduct to see if they reference management systems resulted with 50% of the codes of conduct having no reference to management systems. Within the latest industry codes of conduct 54% of the companies do not reference management systems (24% do not disclose their codes of conduct and 28% do not reference environmental policy statements). If the companies that do not disclose their codes of conduct were removed, this would mean that 37% do not reference their management systems within their codes of conduct. Within the current codes of conduct, what is seen is that 12% (16% not including companies that do not disclose code of conduct) reference continuous, systematic is not referenced, management systems are referenced by 20% (26%), according to standards is referenced by 4% (5%), program and internal control is referenced by 8% (11%) and continuous and systematic is referenced by 4% (5%).

3.4.2.2.5 Comparison of Code of Conducts- management systems

Comparing the same company's evolution, the trends show that there is a 20% increase to reference the management systems within the codes of conduct, a 20% increase to reference directly management systems and a 20% increase to reference program and internal controls (that can include management systems). There was an only 10% increase for referencing continuous and for continuous and systematic. For according to standards this dropped by 20% and just systematic was reduced by 10%.

Comparing the first code of conducts reference of management systems by the common companies to the latest code of conduct reference to management systems by the industry-wide companies shows that there was a 4% increase in the number of companies that do not reference management systems. However, if the companies that do not disclose their codes of conduct were removed, this would mean that 37% do not reference their management systems within their codes of conduct.

As seen within the first codes of conduct what resulted was that none of the companies referred to either program and internal controls and continuous and systematic, 10% of the companies reference continuous,

10% reference systematic, 10% reference management system is 20% reference according to standards. Thus, program and internal control reference use increased by 8% (11%) and continuous and systematic use increased by 4% (5%). Also, reference to continuous increased by 2% (6%) and to management systems increase by 10 (16%). While, there was a decrease in the use of according to standards of 16% (15%) and in the use of systematic of 10%. In the latest Code of Conducts 70% of the common companies' reference EMS, while among the industry-wide companies 46% reference the same. References to „according to standards", „program and internal control", and „continuous and systematic" seem to have fairly the same distribution within the codes as the reference to management systems; a slightly higher percentage for the common companies than for the industry-wide companies. This could indicate that the wider scope of the included companies affects management system referencing within codes of conducts.

3.4.2.2.   Sustainable Development in Codes of Conduct

This section will look at the common companies first codes of conduct to see if sustainable development is referenced and in addition to finding in what way is sustainable development being used. This will be followed up by a look at the common companies first codes of conduct to see if and in what way „sustainable development" is being used. Further proceeded by exploring the industry's codes of conduct in regards to the use of sustainable development and what supporting terms are used. Ultimately, there will be a comparison between the first code of conduct analysis and the latest code of conduct analysis (industry results will be used).

3.4.2.3.1 Code of Conducts: Common Companies- sustainable development

3.4.2.3.1.1 First Code of Conducts

Within the first version of the code of conduct from the 40% of companies that reference sustainable development 50% of these companies use contribute to, while 25% use promote and the other 25% uses strategy.

3.4.2.3.1.2 Latest Code of Conducts

For the most recent versions of the codes of conduct, there was also 40% reference to sustainable development. Of which, 50% also uses contribute, while 25% uses strategy and 25% uses in line with. In addition, for the latest code of conduct, Pemex used sustainability in reference to a sustainable Pemex, Chevron had a section titled environmental sustainability and Eni also references sustainable growth. Furthermore, Eni, Shell and Total reference sustainable development several times.

3.4.2.3.2 Code of Conducts: Industry-Wide Companies- sustainable development

3.4.2.3.2.1 Latest Code of Conducts

Within the latest industry-wide company code of conducts, 29% of the codes of conduct reference sustainable development. In addition, Lukoil references sustainable development in the following manner: "following the norms of effective legislation is the foundation for the sustainable development of LUKOIL. "Therefore, the percentage of companies that use sustainable development with reference to global/world development is even smaller only 25%. This is also seen in Pemex's latest code of conduct, where sustainability is used in reference to a sustainable Pemex.

However, it is noteworthy to mention that Chevron had a section titled environmental sustainability, Gazprom used sustainable nature management and Eni also references sustainable growth. Furthermore, Eni, Shell and Total reference sustainable development several times.

3.4.2.3.3 Comparison of Code of Conducts- sustainable development

Looking at both the first codes of conduct and the latest codes of conduct in reference to sustainable development, the findings result the same. In both versions only 40% of the companies reference sustainable development, while 60% do not. The main difference was that Statoil within its first code of conduct did reference sustainable development, yet within its latest code of conduct did not. In contrast, Eni did not reference sustainable development in the first code of conduct and in the latest version of the code of conduct they did. Looking at both the latest common codes of conduct and the latest codes of conduct for the industry in reference to sustainable development, the results are not the same. For the most recent version 71% (including those that do not disclose their code of conduct and those codes of conduct that are disclosed and sustainable development, the findings result is not the same. As in the first version only 40% of the companies' reference do not reference sustainable development) do not reference sustainable development. Only 29% of the codes of conduct reference sustainable development, this is a 11% decrease from the first version.

3.4.3.Environmental Reports: Scope Change

This section will analyze company environmental reports in regards to their scope, page length, and year throughout three time periods: first reports, middle reports and latest reports. Thus, establishing if there are any changes and what those shifts are. The first and middle environmental reports analysis will be conducted for only the common companies, while the latest environmental reports analysis will be conducted for both the common companies and the industry. Ultimately, there will be a comparison between the first, middle and latest environmental reports (industry results will be used). In addition, there will be a deeper analysis into the latest industry environmental reports looking at if the companies" scope increased to a quadruple sustainability perspective.

3.4.3.1 Environmental Reports: Common Companies- scope change

3.4.3.1.1 First Environmental Reports

The first environmental reports released by the companies range from the years 1990-1999, in addition, Petrobras's first environmental report was not found. The length span between the different companies first environmental report is significant and can be up to 9 years. Wateringen had original sorted these companies into early reporters and late reports, however, this was not maintained within this study. The length of the environmental report ranges from 17 pages to 45 pages and the scope ranges between environmental reports and health, safety and environment reports. The average year for the first environmental report is 1994.6, this is rounded to 1995. The average number of pages is 27.5, rounded off 28. In addition, it was found that 8% of the company reports were not found, 31% of the companies had just environmental reports and the majority of the 61% of the companies had HSE reports. Most (54%) of the companies had 20-29-page environmental reports, followed with 15% each by reports that had between 0-19 pages and 30-39 pages. The smallest percentage of companies (8% each) either did not have an environmental report or had over 40 pages. The years the company's first introduced their environmental reports is fairly evenly spread out except for three years in 1995 23% of the companies introduced their environmental reports, in both 1990

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and 1996 15% of the companies introduced their environmental reports. The lowest amount of environmental reports introduced were 0% in both 1992 & 1993. The rest of the years are fairly equally distributed with approximately 8%.

3.4.3.1.2 Middle Environmental Reports

The middle environmental reports range from the years 2001-2002, their page number ranges from 24 to 111 and their scope ranges between HSE reports, Environmental and Social (double) reports and sustainability reports (triple). Although, from the company reports that had triple sustainability reports here, it was not possible to find out how many had quadruple sustainability as those reports are no longer available. The average year was 2001.6 rounded to be 2002 and the average page numbers was 53.8 rounded to be 54.

Almost the majority (42%) of middle environmental reports had between 41-60 pages in length, followed by 34% having between 21-40 pages in length. None (0%) of the companies had below 20 pages, while three different lengths had 8% each: 61-80 pages, 81-100 pages and over 100 pages. Most (67%) of the middle reports were from 2002, however, 33% were from 2001. Half (50%) of the environmental reports were Environmental and Social reports (double), followed by sustainability reports (triple) that had 33%, only 17% of the companies had HSE reports, while the none (0%) of the companies had just environmental reports.

3.4.3.1.3 Latest Environmental Reports

The most recent environmental reports range from the years 2011-2022, in addition to one ConocoPhillips that was the findings of such information was not applicable, as the most recent corporate group environmental report was in 2008. They do currently have yearly regional environmental reports however, due to the number and specific concentration of each environmental report they are not applicable for this study. The range for page numbers of the environmental reports is from 41 to 265 pages and their scope ranges between not applicable and sustainability reports (triple) for the comparable findings. Although, currently there are also environmental reports that have quadruple sustainability. The average year was 2011.3 rounded to be 2011 and the average page numbers was 93.4 rounded to be 93.

Almost the majority (46%) of most recent environmental reports had between 41-60 pages in length, followed by 18% having between 81-100 pages and another 18% having over 100 pages in length. None (0%) of the companies had below 20 pages, while 61-80 pages and not applicable had each 9%. Most (64%) of the latest reports were from 2011, however, 27% were from 2012. When looking at a comparable change of scope (without quadruple sustainability) then 91% of the companies had triple sustainable and the remaining 9% is the not applicable category. However, when addressing the new concept of quadruple sustainability of the latest environmental reports 82% of the reports scope is quadruple sustainability, 9% is triple sustainability and 9% is not applicable. While, none (0%) of the companies had just environmental reports, HSE reports or double Sustainability Reports.

3.4.3.2 Environmental Reports: Industry-Wide Companies- scope change

3.4.3.2.1 Latest Environmental Reports

The most recent environmental reports for the industry-wide companies range from the years 2008-2012, in addition there are those that are not applicable and have no environmental report. The range for page numbers of the environmental reports is from 39 to 265 pages and their scope ranges between

environmental reports, health safety and environment reports and sustainability reports (triple) for the comparable findings. In addition to those that are also quadruple sustainability reports. The average year was 2011 and the middle year was also 2011. The average page length of the environmental reports is 87.6 rounded to be 88 and the middle year was 72.5 rounded to 73.

Almost the biggest percentage (31%) of recent environmental reports had between 41-60 pages in length, followed by 19% having over 100 pages in length and another 19% that did not have environmental reports. Followed by 15% had between 61-80 pages 8% had between 81-100 pages, only 4% had between 21-40 pages and another 4% had not applicable environmental reports and none (0%) of the companies had below 20 pages. Most (50%) of the latest reports were from 2011, however, 19% were from 2012. Another 19% had no environmental reports, and 2008, 2010 and not applicable each represented 4% of the reports. When looking at a comparable change of scope (without quadruple sustainability) then 69% of the companies had triple sustainable and the remaining 9% is the not applicable category. However, when addressing the new concept of quadruple sustainability of the latest environmental reports 61% of the reports scope is quadruple sustainability, 8% is triple sustainability. In addition, 19% had no environmental reports, 4% represents environmental reports, 4% is Health, Safety and Environment Reports, 4% is not applicable and 0% of the companies had Social and environmental reports (double). However, while Gazprom was the only company to have just environmental report, this is due to have two environmental reports one just focusing on environment and one on sustainability.

Note: Environmental Policies are only considered for those that are referred to as environmental policies the development in change of scope for the common companies is pretty clear. There is a significant increase in the number of pages in the reports from the first to the middle and to the latest reports. Also, the addressed scope changes from single (first reports) to double and triple (middle reports), and finally to majority triple or quadruple (latest reports). When adding the findings from the latest reports from the industry-wide companies, 61% of the companies have a quadruple scope while the pages remain about the same. All these points towards an increasing focus on these kinds of reports over time and that the companies consider multiple aspects to be part of their responsibility/risk.

3.4.4. Environmental Reports: Policies and Codes of Conduct

This section will be addressing if environmental reports contain company environmental policies and references to codes of conduct.

3.4.4.1. Inclusion of Policy

This will be done by conducting a common company analysis for the inclusion of environmental policies within the first, middle and latest environmental reports. Proceeded with a comparison between the findings of the first, middle and latest environmental reports (common companies results will be used) in regards to the inclusion of environmental policies. In addition, there will be the latest industry environmental reports analysis in regards to the inclusion of environmental policies. Ultimately, there will a comparative analysis between the first (common companies), middle (common companies) and the latest industry environmental reports.

3.4.4.1.1. Environmental Reports: Common Companies- inclusion of environmental policies

3.4.4.1.1.1. First Environmental Reports

From the first environmental reports 79% of the companies had included their entire environmental policies, 7% had not and 14% of the companies did not have environmental reports.

3.4.4.1.1.2. Middle Environmental Reports

In the middle environmental reports, the inclusion of environmental policies is by 64%, even though the number of companies that had environmental reports increased to 100%. Latest Environmental Reports.

3.4.4.1.1.3. Latest Environmental Reports

Within the most recent environmental reports only 18% of the companies include their environmental policies, thus with 82% of the companies not including their environmental policies within their latest environmental reports.

3.4.4.1.2 Environmental Reports: Industry-Wide Companies- inclusion of environmental policy

3.4.4.1.2.1 Latest Environmental Report

The industry-wide company findings is that the in the latest environmental report 20% of the companies include environmental policies, while 60% do not include environmental policies and 20% of the environmental reports could not be found. In addition, as a result of having such a reduced amount of companies including their environmental policy this paper looking into the amount of companies that at least referenced their environmental policies within their latest environmental reports. What is seen is that 52% of the companies at least reference their environmental policy, while 20% have no environmental reports and 28% do not refer at all to their environmental policies.

3.4.4.1.2.2 Observations

Observations were also made that Eni, ConocoPhillips, Lukoil and Sonatrach reference HSE policy with environment and as integrated component of their policy. A further interesting note is that Sinopec and Rosneft referenced sustainability policy. As four companies have referenced HSE and only two have referenced sustainability, it could possible demonstrate that the integrated policies are beginning to shift in scope. It is also worth mentioning that while Total does not reference an environmental policy it does reference a Safety Health Environment Quality Charter, while Statoil's environmental policy within the environmental report is different from the environmental policy on their website.

3.4.4.1.2. Comparison of Environmental Reports- inclusion of environmental policy

Thus, there was a 15% decrease from first reports to middle reports or in other words a 29% increase in the companies that did not include their environmental policies. From the middle reports to the latest reports there was a 46% decrease in the amount of companies that included their environmental reports. In total from the first environmental reports to the latest environmental reports there was a significant decrease of the amount of 61%. Within the most recent industry-wide environmental reports only 20% of the companies include their environmental policies, while 20% of the companies did not have environmental reports, thus with 60% of the companies did not include their environmental policies within their latest environmental reports. If the companies that did not have environmental reports were not considered then

only 25% of the companies would have included environmental policies within their environmental reports and 79% of the companies would not. Thus, the comparing the latest company findings of Wateringens (18%) study to those of the 25 companies (25%) what is found is that there is no significant different if the companies that do not have environmental reports are not considered. In addition, if the companies that have do not have environmental reports are accounted for then the difference is 20% in the 25 companies' study that is also not a considerable difference as Wateringens companies having 18%.

3.4.4.1.2 Environmental Reports: Industry-Wide Companies- inclusion of environmental policy

3.4.4.1.2.1 Latest Environmental Report

The industry-wide company findings are that the in the latest environmental report 20% of the companies include environmental policies, while 60% do not include environmental policies and 20% of the environmental reports could not be found. In addition, as a result of having such a reduced amount of companies including their environmental policy this paper looking into the amount of companies that at least referenced their environmental policies within their latest environmental reports. What is seen is that 52% of the companies at least reference their environmental policy, while 20% have no environmental reports and 28% do not refer at all to their environmental policies.

3.4.4.1.2.2 Observations

Observations were also made that Eni, ConocoPhillips, Lukoil and Sonatrach reference HSE policy with environment and as integrated component of their policy. A further interesting note is that Sinopec and Rosneft referenced sustainability policy. As four companies have referenced HSE and only two have referenced sustainability, it could possible demonstrate that the integrated policies are beginning to shift in scope. It is also worth mentioning that while Total does not reference an environmental policy it does reference a Safety Health Environment Quality Charter, while Statoil's environmental policy within the environmental report is different from the environmental policy on their website.

3.4.4.1.3. Comparison of Environmental Reports- inclusion of environmental policy

Thus, there was a 15% decrease from first reports to middle reports or in other words a 29% increase in the companies that did not include their environmental policies. From the middle reports to the latest reports there was a 46% decrease in the amount of companies that included their environmental reports. In total from the first environmental reports to the latest environmental reports there was a significant decrease of the amount of 61%. Within the most recent industry-wide environmental reports only 20% of the companies include their environmental policies, while 20% of the companies did not have environmental reports, thus with 60% of the companies did not include their environmental policies within their latest environmental reports. If the companies that did not have environmental reports were not considered then only 25% of the companies would have included environmental policies within their environmental reports and 79% of the companies would not. Thus, the comparing the latest company findings of Wateringens (18%) study to those of the 25 companies (25%) what is found is that there is no significant different if the companies that do not have environmental reports are not considered. In addition, if the companies that have do not have environmental reports are accounted for then the difference is 20% in the 25 companies' study that is also not a considerable difference as Wateringens companies having 18%.

3.4.4.2. Reference to Code of Conduct

3.4.4.2.1 Environmental Reports: Common Companies- reference to the code of conduct

3.4.4.2.1.1 First Environmental Reports

From the first environmental reports only 14% of the companies had referenced their codes of conduct, 72% had not and 14% of the companies did not have environmental reports.

3.4.4.2.1.2 Middle Environmental Reports

In the middle environmental reports, the reference to the companies codes of conduct had increased to 55%, with the number of companies that had environmental reports also increasing to 100%.

3.4.4.2.1.3 Latest Environmental Reports

Within the most recent environmental reports only 9% of the companies did not reference their codes of conduct, thus with 91% of the companies did refer to their codes of conduct.

3.4.4.2.2 Environmental Reports: Industry-Wide Companies- reference to the code of conducts

3.4.4.2.2.1 Latest Environmental Reports

From the most recent environmental reports 60% of the companies reference their codes of conduct, while 20% do not reference their codes of conduct and another 20% do not have environmental reports. If the companies that do not have environmental reports are not included then 75% of the companies refer to their codes of conduct while 25% do not.

3.4.4.2.2.1.1 Observations

However, the observation was made that Abu Dhabi National Oil Corporation did reference its code of practice this is more of a manual rather than code; therefore, it was not accounted for as referencing its code of conduct. Furthermore, while Saudi Aramco does not reference its own corporate code of conduct it does have and reference its supplier code of conduct.

3.4.4.2.3 Comparison of Environmental Reports- reference to codes of conduct

From the first environmental reports to the middle environmental reports what is witnessed is a 41% increase in the companies referencing their codes of conduct. From the middle reports to the latest reports a further increase of 36% occurred in the referencing of company codes of conduct within their reports. However, as a result from the first environmental reports to the latest (common companies) environmental reports there was a significant increase of 77%.

However, the increase from the middle (common companies) environmental reports to the most recent (industry-wide companies) environmental reports has been considerably smaller at only 5% (or 20% without the companies with no environmental reports). Thus, the comparing the latest company findings of Wateringens (91%) study to those of the 25 companies (60/75%) what is found is that there is a slight difference. This difference is more significant it the companies that do no have environmental reports are taken into consideration as there is a 31% difference. If the companies that do not have environmental reports are not considered then the difference is 16%, this is not as large of a difference.

3.4.5.Environmental Policy: Content Analysis

This section will analyze the common companies first environmental policy, middle environmental policy. Proceeded with a comparison between the first, middle and latest environmental policies (common companies results will be used). Then, the latest environmental policy, analysis will be addressed. Ultimately, there will be a comparative analysis between the first (common companies), middle (common companies) and the latest industry environmental policy.

3.4.5.1 Environmental Policy: Common Companies- content analysis

3.4.5.2 First Environmental Policy

The 36% of the first environmental policies referenced management systems, while 64% of the company environmental policies did not make such references.

3.4.5.2.1 Middle Environmental Policy

From the middle environmental policies 33% of them were not found, while from the ones that were encountered only 25% of the companies referred to management systems while 42% did not.

3.4.5.2.2 Latest Environmental Policy

Of the latest environmental policies 54% reference management systems while only 8% of them do not make such reference. However, the percentage of policies not encountered was 38%.

3.4.5.3 Environmental Policies: Industry-Wide Companies- content analysis

The 25 company findings on the latest environmental policies reference to management systems reveal that the biggest percentage 48% referenced management systems, 45% of the environmental policies were not found and the remaining 7% did not make any reference to management systems.

3.4.5.3.1.1.1 Observation

An observation was made that companies are integrating their environmental policies with other important company aspects. A few examples: health, security, safety, the environment (HSSE) and social performance (SP) policy (shell); SSPA (company management system) policy; HSE policy (Total); Hse and climate report policy (Statoil); and Sustainability Policy (Sinopec). Another observation was that the Kuwait Petroleum Corporation HSE Policy is written for their employees as a code rather than a company guide. In addition, some companies such as Gazprom reference ISO 14001 within their environmental policies, going even further Lukoil refers to specific standards OHSAS 18000, ISO 14001 and ISO 17020 within their environmental policies.

3.4.5.4 Comparison of Environmental Policy- content analysis

There was a decrease of company environmental policy statements referencing management systems by 9% from the first to the middle environmental policies. However, at the same time the amount of environmental policies that were not found increased by 33% (as it rose from 0% to 33%). From the middle environmental policies to the latest (common companies) environmental policies management system reference increased by 29%, in addition the companies for which their environmental policies could not be found also increase by 5%, while the companies that do not reference management systems decreased to 8%.

These results are similar (although small variation) to the findings from the common companies that had 38% (8% less) unfound environmental policies, 54% (6% more) referenced yes, while 8% (1%) did not refer to management systems.

3.4.6. Environmental Reports: Reference to EMS

This section will analyze the EMS reference within environmental reports in three time periods: the first reports, the middle reports and the latest reports for common companies. Then it will analyze the EMS reference within industry-wide latest reports. Proceeded by a comparative analysis between the first (common companies), middle (common companies) and the latest (industry wide) environmental reports, with difference between the latest common analysis and the latest industry-wide analysis. Ultimately, it will look at the extent of the industry-wide EMS reference within environmental reports and titles of their EMS.

3.4.6.1 Environmental Reports: Common Companies- reference to EMS

3.4.6.1.1 First Environmental Reports

The 57% of the first environmental reports reference the company's EMS, 36% do not reference EMS systems and 7% do not have environmental reports.

3.4.6.1.2 Middle Environmental Reports

Of the middle environmental reports, 75% refer to their companies' EMS, while 25% do not (with all companies having released environmental reports).

3.4.6.1.3 Most Recent Environmental Reports

Within the most recent environmental reports 73% of the companies reference their EMS, while 27% do not. An observation is that both ConocoPhillips and Shell mention management within their most recent environmental reports, yet this was not included to the fact that environmental was not specifically referred to within this management system within the environmental report. Therefore, it is worthwhile mentioning that 91% of the companies do mention management systems within their environmental management system.

3.4.6.2 Environmental Reports: Industry-Wide Companies- reference to EMS

Currently a larger majority of the companies reference their EMS systems within their environmental reports. Within the most recent environmental reports 69% of the companies reference their EMS, while 19% have no environmental reports, and 12% do not reference their company's EMS. Thus, it could be helpful to identify the extent of referencing of their EMS systems within their environmental reports. Looking at if companies include a description of their EMS system within their latest environmental reports in addition just referencing their EMS revealed that only 27% of the companies did so. An additional 12% did not provide a description of the company EMS, but did describe what was being done in reference to EMS within the company. Almost the majority of the company's 42% did not refer to any type of EMS description within their latest environmental reports and 19% of the companies did not have environmental reports Another aspect that is useful for looking at the company's EMS frameworks it to see what the company calls their EMS and to classify them; although this was not does for previous years, therefore a trend for this aspect could not be established. From the companies that referenced an EMS system within their environmental report the largest percentage (32%) of them had an HSE-MS title followed by EMS and

Operating MS with 12% each, ultimately with only 4% each Sustainability MS and Other Integrated MS had the lowest percentage of companies. In addition, 20% of the companies did not have environmental reports and a further 16% did not at all reference EMS within their environmental reports.

3.4.6.3 Comparison of Environmental Reports: Reference to EMS

From the 57% of the first environmental reports reference the company's EMS, there is an increase to 75% within the middle environmental reports. Within the most recent environmental reports there was a decrease to 73% of the companies reference their EMS, while 27% do not. For the industry wide companies 69% reference their EMS, while 19% have no environmental reports, and 12% do not reference their company's EMS. Thus, there would be a 6% decrease from the middle reports. However, if the companies with no environmental reports were removed from the equation then 86% of the companies that have environmental reports reference EMS and only 14% don't.

3.4.7.Environmental Reports: Reference to ISO 14001 & EMAS

This section will look at if ISO 14001 and EMAS are referenced within company environmental reports.

3.4.8.Reference to ISO 14001

This section first will look at if the first, middle and latest common company reports referenced ISO 14001. Proceeded looking at if the industry wide companies referenced ISO 14001 within their latest environmental reports. Then a comparative analysis was conducted comparing the first (common), middle (common) and latest (industry-wide) environmental reports in regards to referencing ISO 14001.

3.4.8.1.1.   Environmental Reports: Common Companies- reference to ISO 14001

3.4.8.1.1.1 First Environmental Reports From the first environmental reports, what is seen is that 50% of the companies' reference ISO 14001, 36% do not make such reference and 14% of the companies have no environmental reports.

3.4.8.1.1.2 Middle Environmental Reports

Within the middle environmental reports, 75% of the companies' reference ISO 14001, while 25% do not with 0% of the companies having no environmental reports.

3.4.8.1.1.3 Latest Environmental Reports

The latest environmental reports the reference ISO 14001 is made by 73% of the companies, while 27% do not make such reference.

3.4.8.1.2.   Environmental Reports: Industry-Wide Companies- reference to ISO 14001

From the latest environmental reports of the 25 companies selected within this study 60% of the companies reference ISO 14001, 20% of the companies do not make such reference, while 20% of the companies do not have environmental reports.

3.4.8.1.3.   Comparison of Environmental Reports-reference to ISO 14001

There is a 13% decrease from the common companies that reference ISO 14001 to the industry wide analysis. However, when the companies that have no environmental reports are removed from the equation

then 75% of the companies that have the latest environmental reports reference ISO 14001 and 25% do not. However, if looking at the companies that have environmental reports then the findings are similar. In addition, the biggest peak of reference to ISO 14001 was from the first environmental reports to the middle environmental reports with a 25% increased, this percentage was maintained (75% with the companies that do not have environmental reports not considered).

3.4.8.2. Reference of EMAS

This section first will look at if the first, middle and latest common company reports referenced EMAS. Followed by looking at the industry wide companies referenced ISO 14001 within their latest environmental reports. Then a comparative analysis was conducted comparing the first (common), middle (common) and latest (industry-wide) environmental reports in regards to referencing ISO 14001.

3.4.8.2.1 Environmental Reports: Common Companies- reference to EMAS

3.4.8.2.1.1 First Environmental Reports

Looking at the referencing of EMAS within the first environmental reports, 22% of the companies refer to EMAS, 64% of the companies do not and 14% have no environmental reports.

3.4.8.2.1.2 Middle Environmental Reports

However, in the middle reports EMAS is only referenced by 17% of the companies while 83% of the companies do not reference it.

3.4.8.2.1.3 Latest Environmental Reports

In addition, within the latest EMAS is only referenced by 9% of the companies, while 91% do not make such reference.

3.4.8.2.2 Environmental Reports: Industry-Wide Companies- reference to EMAS In addition, from the latest environmental reports of the 25 largest oil companies only 4% reference EMAS, while 76% do not and 20% do not have environmental reports.

3.4.8.2.3 Comparison of Environmental Reports- reference to EMAS

However, EMAS referencing was not as popular from the start, as to begin with only 22% of the companies referenced it, it decreased only slightly by 5%. This decreased even further by another 8% from the middle environmental reports to the latest environmental reports. This is a yet further decreased to only 4% by the industry wide companies that reference EMAS within their environmental reports.

3.4.8.2.4 Environmental Reports: Industry-Wide Companies- other standards

3.4.8.2.4.1 Latest Environmental Report

This study decided that to look at if within the latest environmental reports companies reference other standards such as quality (ISO 9001) or health and safety (OHSAS 18001) as this indicates the importance of other issues alongside the environment, and in addition the referencing can be compared in order to indicate what companies reference more. ISO 9001 is referred to by 24% of the company the latest environmental reports, 56% did not make such reference and 20% do not have environmental reports.

OHSAS 18001 is referred within 36% of the latest environmental reports, 44% do not make such reference and 20% have no environmental reports.

3.4.9.Environmental Reports: Monitoring and Verification

This section will look into whether companies are addressing auditing (audit program) and have some form of verification/assurance statement (verification statement) within their environmental reports.

3.4.9.1. Reference to environmental monitoring

This section will first address company reference to their own auditing program within the common first, middle, latest environmental report and then address industry wide companies within the latest environmental report. Ultimately there will be a comparative analysis comparing the first (common), middle (common) and latest (industry-wide) environmental reports in regards to referencing of the company audit program.

3.4.9.1.1 Environmental Reports: Common Companies- auditing programs

3.4.9.1.1.1 First Environmental Reports

The first environmental reports looked at referred to their company auditing programs with 57% and 29% of the company first environmental reports did not make such references. Yet, 14% of the companies did not have environmental reports. In addition, 36% of the of the companies provided some form of assurance or verification for their first environmental reports, 50% did not do so and 14% did not have environmental reports.

3.4.9.1.1.2 Middle Environmental Reports

The middle environmental reports referenced their companies auditing program 50% of the time while the other 50% they did not. Furthermore, report verification and assurance was done also by 50% of the companies while 50% of the companies did not do so

3.4.9.1.1.3 Latest Environmental Reports

Within the most recent environmental reports 82% of them reference their companies auditing program while 18% do no and all the environmental reports provide some form of verification and assurance.

3.4.9.1.2 Environmental Reports: Industry-Wide Companies- auditing program

The latest environmental reports mention their own auditing program 60% of the time, 20% of the companies do not have environmental reports and the remaining 20% make no such reference to their auditing programs.

3.4.9.1.2.1.1 Observations

An 8% of the companies that do not reference their own auditing programmer do reference an external auditor. The referencing of company auditing program greatly varies some environmental reports minimally reference the companies auditing program while other reports give more detailed descriptions. Furthermore, Sinopec does not refer to auditors or auditing teams but rather to inspections and inspection teams.

3.4.9.1.3 Comparison of Environmental Reports- auditing program

From the first environmental reports to the middle environmental reports the referencing of company auditing programs decreased by 7%, while the verification or assurance of the environmental reports increase by 14%. From the middle to the most recent environmental reports there was an increase by 32% of referencing of company auditing programs. Furthermore, there was a significant increase (50%) from the middle environmental reports to the most (common companies) recent environmental reports of verification and assurance. The latest industry-wide companies environmental reports have 22% less companies that reference their auditing programs than in the latest common company environmental reports.

3.4.9.2. Verification of Environmental Report

This section will look into whether companies are a have some form of verification/assurance statement (verification statement) within their environmental reports. Therefore, this paper will first address common companies have reference a verification statement for their first, middle, latest environmental reports and then address industry wide companies environmental. Ultimately there will be a comparative analysis comparing the first (common), middle (common), latest (common) and latest (industry-wide) environmental reports in regards to referencing of the company audit program.

3.4.9.2.1 Environmental Reports: Common Companies- verification of reports

3.4.9.2.1.1 First Environmental Reports The first environmental reports had 36% of the companies that provided some form of assurance or verification for their first environmental reports, 50% did not do so and 14% did not have environmental reports.

3.4.9.2.1.2 Middle Environmental Reports

The middle environmental report verification and assurance was done also by 50% of the companies while 50% of the companies did not do so.

3.4.9.2.1.3 Latest Environmental Reports Within the latest environmental reports all them provided some form of verification and assurance.

3.4.9.2.2 Environmental Reports: Industry-Wide Companies- verification of report

3.4.9.2.2.1 Latest Environmental Report

Addressing verification and assurance of the latest environmental reports 60% of the companies make such statements, while 16% of the companies make no such statement, 4% inform that they did not conduct an assurance or verification of their latest environmental report and 20% of the companies do not have environmental reports. Furthermore, this study has addressed which verification parties are selected by companies for their assurance statements. The findings concluded that 20% of the companies did not have environmental reports, another 20% made no reference to their verification party, and 4% stated they did not conduct assurance of their environmental reports. From those that did reference and conduct assurance and verification 20% were performance by Ernest & Young, 12% by KPMG, 8% by Lloyds, 8% by some committee or council, 4% by PricewaterhouseCoopers and 4% by eternal individuals.

3.4.9.2.3 Comparison of Environmental Reports- verification statement

From the first environmental report to the middle environmental report there was a 14% increase in verification statements. From the middle (common companies) environmental report the latest (common companies) environmental report there was an increase of 50% of variation statements. There is a significant difference within the verification of the reports where the 25 companies had 40% of a decrease from the common companies. However, some of these differences can be attributed to the fact that the common companies all produce the latest environmental reports while 20% of those from the 25 companies do not.

3.4.10. Environmental Performance Indicators

This section will look at the type of key environmental performance indicators companies use. The indicators are split into four types: atmospheric (A), aquatic (Q) or terrestrial (T) or a combination of impacts or influences on the environment. The types of disclosure indicators used are split as well into four possibilities: absolute figures (F), over the years comparison (C) or targets (T) or a combination of those. This section will first look at if common companies have reference to which key environmental performance indicators they use for their first, middle, latest time period and then address the latest period for industry wide companies. Ultimately there will be a comparative analysis comparing the first (common), middle (common), latest (common) and latest (industry-wide) in regards to referencing of the key environmental performance indicators.

3.4.10.1 Environmental Performance Indicators: Common Companies

3.4.10.1.1 First Time Period

For environmental performance indicators absolute figures type, the findings showed that 17% of the common companies had such indicators. For the environmental performance indicators targets type, the findings resulted in 33%. For environmental performance indicators over the years comparison type, the findings resulted with 83% of the companies. For environmental performance indicators atmospheric number are used by 92% of the companies. The number aquatic for the environmental performance indicators used resulted with the findings that the indicators are used by 92% of the companies. The terrestrial symbol for the environmental performance indicators has 92% of the companies using it.

3.4.10.1.2 Middle Time Period

The environmental performance indicators absolute figures type resulted with 17% of the companies using it. For environmental performance indicators targets type, the findings showed that the indicators are being used by 0% of the companies. For environmental performance indicators over the years comparison results found that 67% of the companies used them. The environmental performance atmospheric number used is 83%. The number of aquatics for environmental performance indicators used showed that the indicators are used by 42% of the companies. The terrestrial indicator of environmental performance have 50% of the companies using it.

3.4.10.1.3 Latest Time Period

The environmental performance indicators absolute figures type resulted with 100% use. The environmental performance indicators targets type findings show that 0% use them. The environmental performance indicators over the years comparison type have 100% of the companies using it. The environmental performance atmospheric number results found is that 100% of the companies use them. The symbol for

aquatic for environmental performance indicators has 91% of the companies using them. And the terrestrial symbol of environmental performance indicators used by the companies is 82%.

3.4.10.2 Environmental Performance Indicators: Industry-Wide Companies

For environmental performance indicators absolute figures type, the findings showed that 72% of the common companies had such indicators. For the environmental performance indicators targets type, the findings resulted in 8%. For environmental performance indicators over the years comparison type, the findings resulted with 72% of the companies. For environmental performance indicators atmospheric number are used by 72% of the companies. The symbol0 „aquatic" for the environmental performance indicators used showed that the indicators are used by 64% of the companies. The terrestrial symbol for the environmental performance indicators has 56% of the companies using it.

3.4.10.3 Comparison of Environmental Performance Indicators

For environmental performance indicators absolute figures type, it stayed the same from the first to the middle indicators at 17%. From the middle to the latest these indicators grew to 100% for the common companies. However, when the latest indicators are compared from Wateringens companies to those of the current study of 25 companies what is seen is a decrease of 28%, so that the company's environmental performance indicators referenced in absolute figures are 72%. The steep rise between the middle and latest environmental reports could be due to Wateringen considering comparison over the years to include also absolute figures; however, this study has considered them to be separate. There is a difference between Wateringens latest results (100%) in regards to absolute figures of EPI and the industry latest results (72%). However, if the for the industry findings the companies with no referencing are removed the results would be exactly the same as for Wateringens.

For environmental performance indicators targets type, the findings decreased from the first to the middle indicators going from 33% to 0%. From the middle to the latest period, indicators this remained the same for the common companies. However, when the latest indicators are compared from Wateringens companies to those of the current study of 25 companies there was an increase of 8%. This is an interesting result, as the 8% of the companies referencing their environmental performance targets are geographically Eurasian (Russian). The difference between the results of latest environmental reports could be due to Wateringen considering comparison over the years to include also absolute figures, however this study has considered them to be separate. While, this author cannot make an inference on the reasoning behind the two companies with environmental performance targets being Eurasian (Russian), it is a question to pose for future research.

For environmental performance indicators over the years comparison type, the findings decreased from the first to the middle indicators going from 83% to 67%. From the middle to the latest indicators this trend was reversed as all (100%) of the latest environmental performance indicators had over the years comparisons. However, when this is compared to the industry results, there is a 28% difference that is due to companies not referencing any of their environmental performance indicators. However, if the for the industry findings the companies with no referencing are removed the results would be exactly the same as for Wateringens. This is also illustrated as the latest common companies have no companies whose environmental performance indicators that are not referenced while the industry companies have 28%.

For environmental performance indicators atmospheric symbol used, the findings decreased from the first to the middle indicators going from 92% to 83%. From the middle to the latest indicators this trend was reversed as all (100%) of the latest environmental performance indicators used atmospheric indicators. However, when this is compared to the industry results, there is a 28% difference that is due to companies not referencing any of their environmental performance indicators. However, if the for the industry findings the companies with no referencing are removed the results would be exactly the same as for Wateringens. This is also reinforced by the latest findings that the common companies have no companies whose environmental performance indicators that are not referenced while the industry companies have 28%.

The number aquatic for the environmental performance indicators used, resulted with the findings that there is a significant decreased from the first to the middle indicators going from 92% to 42%. From the middle to the latest indicators this trend was reversed as 91% of the companies used aquatic indicators. However, when this is compared to the industry results, there is a 28% difference that is due to some of the companies not referencing any of their environmental performance indicators. However, if the for the industry findings the companies with no referencing are removed the results would be exactly the same as for Wateringens.

The terrestrial number for the environmental performance indicators concluded that there is a considerable decreased of 42% from the first (92%) to the middle indicators (50%). From the middle to the latest indicators this trend seems to be reversing with 82% of the companies using terrestrial indicators. However, when this is compared to the industry results, there is a 28% difference that is due to some of the companies not referencing any of their environmental performance indicators. However, if the for the industry findings the companies with no referencing are removed the results would be exactly the same as for Wateringens (82%).

Thus, looking at the findings there is a trend for all of the number of environmental performance indicators to start off at a very high percentage, decrease and reverse the trend.

4. Discussion

Having found that 92% of the 25 biggest oil industry companies have reference to the use of EMS, this indicates that there is a considerable tendency within the oil industry to adopt EMS. This asserts Hansens findings the higher environmental impact industries are slightly more likely to assume environmental controls when it regards the petroleum industry assuming EMS (Hansen, 1998:106) (Wateringen).

The findings show that the biggest or steepest year of incorporation of EMS use into companies was between the years of 1996-2000. The first version of ISO 14001 was introduced in 1996. It would therefore be interesting in future research to see if there was a link between the introduction of ISO 14001 and the largest rise in the incorporation of EMS within oil companies. Considering that information on the use of EMS could not be found within only 16% of the industry companies it does not leave much space for further increase of EMS incorporation.

The findings show that currently the majority (80%) of companies use a form of integrated management system and only 12% use EMS. This shows an indication that currently companies are moving away from the single-issue management systems and moving towards more integrated management systems. The results seem to indicate that the most common integrated components are Health, Safety and Environment with 59% of the company use reference. In addition, different and more complex various are also appearing with 5 different combinations of integrated management system components with 4% each: Safety, Security, Health, Environmental and Social Risks; Health, Safety, Security, Environment and Operation Risks; Health, Safety, Security, Environment (HSSE) and Social Performance (SP); Process Safety, Personal Safety & Health, Environment, Reliability and Efficiency; and Health, Safety and Environment(HSE); Ethics; Corporate Social Responsibility; People; Communication Risk Management; Finance and Control; Procurement; Managing Information.

These findings are reinforced by EMS Title results that show that 56% of the companies use HSE management system as their EMS title, 12% use only EMS, while 20% use more complex integrated management system titles. For future studies it will be interesting within a couple of years to see if companies have increased the components of their management systems.

As the majority of companies (60%) currently reference using group wide EMS"s, some even extend beyond this to incorporate subsidiaries, joint venture and contractors it is indicative that there could be a tendency for company's EMS to be structured and set up in a centralized manner. It was challenging to find the structure/layout/organization of the company EMS or integrated management system, as demonstrated by the findings that 56% of the information was not found. From the remaining 44% of the companies that did facilitate this information it was found that it was possible to classify them into 4 categories. The most common category were those companies that just had elements to structure there EMS system, however there were variations with elements and requirements, system elements with subsystems and control frameworks with different areas.

The findings show that the largest percentage of companies 52% have self-designed EMS systems that are compatible with standards, proceeded by 24% of the company's reference could not be found, indicating that the current industry preference it to approach their EMS set up and design according to their own individual need but rather having standards compatibility as a reference, however the industry show signs of not seeking certification. Why the industry chooses to use ISO as a key feature of their design yet not

seek certification is a key follow-up question to this thesis. This is only reinforced by the findings that show that from the information encountered 44% had corporate EMS that were compatible with ISO 14001 but not certified, while in comparison 16% of the companies' corporate EMS are ISO 14001 compatible and certified. An additional as stated previously the information not found is as important as16% had no reference, and 20% were unclear/undeterminable indicating in itself the level of disclosure.

When addressing standards, the oil companies have a higher tendency rate of by at least 68% of using ISO 14001 for reference and guidance in comparison to other standards. Thus, this finding is in accordance with Remmen's statement that most companies take their departure from ISO 14001 and then add additional elements to fulfill EMAS criteria (Remmen). The reasoning behind this has not been addressed in this paper and would be a good issue to look into in the future. Currently there are numerous EMS standards and guidelines and industry guidelines that companies can use as another source of reference companies to set up their EMS"s. However, there was no information found referencing the following standards GEMI, APPEA's Code of Environmental Practice, American Chemistry Council (ACC) Responsible care (RC 14001 or RCMS), and Natural Gas Companies in Latin America and the Caribbean (ARPEL) guidelines for the oil and gas industry in Latin America and the Caribbean. In comparison the most common references were 88% to international standards \ followed by the use of national standards (52%) and IPIECA"s „A common Industry Approach to Global Standards" (52%).

The findings illustrate that there are only three types of documents that are referenced by 50% of the companies. These are environmental policies, strategy, and principles. However, both strategy and principles are broadened from the original scope of just environmental principles and environmental strategy due to the lack of document disclosure. Thus, from the environmental framework documents it can be said that the only documents to have at least 50% disclosure are the environmental policies. Thus, this indicates a lack of company disclosure in the aspect of environmental management framework. Furthermore, in regards to EMS referencing within the addressed guiding documents found guiding documents there is an indication for the company incorporation of EMS. As reference to EMS within the disclosed documents ranges within the three categories of one document 90% and above, 3 documents within 50%-89% and 3 documents in the category of 1-49%, however still all three documents reference EMS above 25%. For 20% of the companies no referencing or information was found regarding any form of company code of conduct. The findings show there is no middle ground when it comes to code of conduct disclosure either they are entirely disclosed or they are kept entirely private. Findings show that there is a constant increase in referencing the companies own internal auditing programs with their environmental reports and the verification of the environmental reports; this indicates that it is probable that referencing of companies own internal auditing programs and verification of reports continues to increase.

Even though there was a decrease in referencing of management systems from first environmental policies to the middle environmental this tendency was reversed with the increase in referencing from middle to latest environmental policies. This indicates that management systems referencing within Environmental policies will rise. Currently, a larger majority (69%) of the companies reference their EMS systems within their environmental reports than within previous reports thus indicating a rise of EMS referencing. This would indicate that it is probable that more companies within the industry will reference their EMS systems with environmental reports in the future. However, looking at the level of their EMS reference it was found that only 27% of the companies included a description of their EMS system within their latest environmental reports.

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From the current findings the significant (60%) company reference to ISO 14001 within their environmental reports indicates that ISO 14001 is considered an important element when conducting and setting up business operations. However, from the view of this author the reference of ISO 14001 in the company environmental reports has already reach over majority of the companies, therefore in the future it is likely that there are more companies that reference ISO 14001 however, the increase will not be very big. EMAS referencing has been only the decline from the first environmental reports, with only 4% of the current company environmental reports referencing it. This can be interpreted as an indication that EMAS is loosing relevance within the oil industry and that it is currently not popular or relevant in the way the companies conduct or set-up their business and framework.

In addition, there is indicatory that other standards have some relevancy and importance within company frameworks and manner of conducting operations. ISO 9001 is referred to by 24% of the company the latest environmental reports, and OHSAS 18001 is referred within 36% of the latest environmental reports. When comparing the percentage of companies that reference ISO 14001 to that of referencing ISO 9001 or OHSAS 18001, it is visible that almost double the amount of companies that reference OHSAS 18001 references ISO 14001 and more than double the amount reference ISO 9001. This suggests that more companies might consider ISO 14001 standard of importance within their business affairs then other standards.

Looking at the environmental indicators companies choose, the findings show that there is a trend for all of the number of environmental performance indicators to start off at a very high percentage, decrease then increase again trend. The main finding for environmental indicators what that future environmental target indicators of what companies strive to achieve were only referenced by 8% of the companies. For future studies it will be an important issue to look at why oil companies choose not to include their future environmental targets within the environmental reports. The scope of the environmental reports shows an increase of issues and aspects being addressed as 82% of the current environmental reports address triple sustainability at least, of which 60% is quadruple sustainability. Looking at the current industry-wide progress, this author assumes that the increase of issues and aspects will continue.

In addition, what was observed was a considerable decrease from the first environmental reports (79%) to the latest environmental reports (20%) in the inclusion of environmental policies. This trend is consistent over three time periods; therefore, the author sees an indication of the inclusion of environmental policies within environmental reports decreasing even further. However, the reference to company codes of conduct from the first environmental report (14%) to the latest environmental report (60%). Thus, indicating that references to the company codes of conduct will continue to rise within future company environmental reports.

However, it is also observed by the author that the industry companies currently disclose little information in regards to the depth of their structure and direction within the environmental area as show by the lack of environmental policies included within the environmental reports but also by the lack of disclosure of environmental targets (only 20%), environmental management plans (only 32% found), environmental objectives (only 36%) and environmental programs (only 8%) found.

As far as the study in itself goes, the author firstly notes the lack of available data for some of the studied variables. Some companies had good and open disclosure on mostly all variables that this thesis looked into, and some were rather undisclosed on all parts. One could argue that this could lead to a gap in the validity

of the information presented in this thesis, but the author would like to stress the importance of "no reference" in this sense. The topic is Environmental Management Frameworks in the Oil Industry, and though not addressed much in this thesis, part of what could be seen as relevant is transparency in environmental disclosure. As the main methodological part of this thesis was to collect disclosed data related to EMS, the author considers "no reference" findings to be important off-topic information.

In retrospect, it could have been a possibility to have selected the companies differently. One way could have been to select a group of large, medium and small companies in order to get size distributional data and results. However, the author considered the most potential impact heavy companies to be of more importance in this case. Another thing that could have been done is a selective screening of companies with poor disclosure in order to improve data availability. On the other hand, this would cause the results to be skewed towards the best performing companies, and not the most impacting ones. The author therefore considered that going by the Forbes list was the best approach. One could also argue that it would have been wise to select fewer companies for this study, but because of the expected lack of data the author saw it necessary to broaden the study in order to get enough data to make the results valid.

When it comes to the categories selected, the author does recognize alternative and other categories that could have been used for the study. For this thesis relatively, specific categories and variables were selected because of the comparative needs in relation to the aim of the paper. If more non-specific categories were selected it would have been compromising the comparability. As an example, it is worth mentioning how companies often publish highlights of their EMS performance and structure. This paper does not address why the current results are happening or why companies decide to act in a specific way. However, in order to ask this question, it is important to first know if something is happening and in what way something is occurring. The author sees this paper as a base to spawn from when asking the why question in future studies.

5. Conclusion

The issue of how oil companies approach EMS structure framework design and content set-up is very complex. First of all, as this study shows, there is great variation between the companies themselves in terms of geographical location, size of operations and production, and ownership to mention a few. It's evident that EMS in general is widely applied in the oil industry, but there are varying approaches in regards to what type of EMS system they choose to use, how they use it, and how they structure it. First of all, ISO 14001 is the predominant EMS standard used by the researched companies. However, as this study looked at corporate EMS systems, few of them were certified. On the other hand, corporate EMSs used the standard as a guideline and claimed to be compatible. Although some were certified on a corporate level, the most widely used approach seemed to be to certification of specific subsidiaries and operations. When specifically looking at the oil companies' current approach to EMS structure design and content set-up the main point that this study concludes on is that there are four emerging categories of EMS structure into which the companies can be placed: Structure by elements only, structure by elements with requirements, structure by element systems with sub-elements, structure by area control frameworks. Further, both environmental objectives and targets are not stated by over half of the researched companies. For the time trends there are some evident changes. First of all, environmental policies are being taken out of the environmental reports, and secondly codes of conduct are being referenced more often. This indicates a higher level of focus on values (code of conduct) and a decreasing focus on commitment (policy). This can be backed up by the low number of companies referencing targets and objectives, and the high rate of modifications for code of conducts. Finally, there is a trend towards more integrated management systems. The movement from EMS to HSE is evident, and there is an indication that some companies start to include additional elements (security, social performance, quality) into their management systems.

The author of this paper recommends that future studies should look into the reasons why companies in the oil industry use ISO 14001 as a point of departure when designing their EMS, even if they don't aim for certification. Another follow up study should be done on the four categories of element structure in the EMS as it would be interesting to find out what determines the structuring of the elements within oil companies. Finally, only a few of the guidelines looked into in this study was referenced relatively frequent. One of them was IPIECA's guidelines. It would be interesting to know the actual application of these guidelines in the oil industry.

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Appendix

Company name (full)	Company Alias	Founded	Headquarters	Region	Public/ Private
Saudi Aramco (Saudi Aramco, n.d.-a)	Saudi Aramco	1933	Dhahran, Saudi Arabia	Middle East	Private
OAO Gazprom (Gazprom, n.d.-a)	Gazprom	1989	Moscow, Russia	Eurasia	Public
National Iranian Oil Co. (National Iranian Oil Company, n.d.)	NIOC	1948	Tehran, Iran	Middle East	Private
ExxonMobil Corporation (ExxonMobil, n.d.-a)	ExxonMobil	*1870	Irving, TX, USA	North America	Public
PetroChina Company Limited (PetroChina, n.d.-a)	PetroChina	1988	Beijing, China	Asia	Public
BP plc. (BP, n.d.-a)	BP	1909	London, England	Europe	Public
Royal Dutch Shell plc. (Shell, n.d.)	Shell	1907	Hauge, Netherlands	Europe	Public
Petroleos Mexicanos (Pemex, n.d.-a)	Pemex	1938	Mexico City, Mexico	North America	Private
Chevron Corporation (Chevron, n.d.-a)	Chevron	1879	San Ramon, CA, USA	North America	Public
Kuwait Petroleum Corporation (KPC, n.d.)	Kuwait Petroleum	1980	Kuwait City, Kuwait	Middle East	Private
Abu Dhabi National Oil Co. (Abu Dhabi National Oil Company, n.d.-a)	ADNOC	1971	Abu Dhabi, UAE	Middle East	Private
Sonatrach (Sonatrach, n.d.-a)	Sonatrach	1963	Algiers, Algeria	Africa	Private

Total S.A. (Total, n.d.-a)	Total	1924	Courbevoie, France	Europe	Public
Petróleo Brasileiro S.A Petrobras (Petrobras, n.d.-a)	Petrobras	1953	Rio de Janeiro, Brazil	South America	Public
NK Rosneft' OAO (Rosneft, n.d.-a)	Rosneft	1993	Moscow, Russia	Eurasia	Public
Iraqi Oil Ministry (Iraqi Oil Ministry, n.d.)	Iraqi Oil			Middle East	Private
Qatar Petroleum (QP, n.d.)	Qatar Petroleum	1974	Doha, Qatar	Middle East	Private
NK Lukoil OAO (Lukoil, n.d.-a)	Lukoil	1991	Moscow, Russia	Eurasia	Public
Eni SpA. (Eni, n.d.-a)	Eni	1926	Rome, Italy	Europe	Public
Statoil ASA (Statoil, n.d.-a)	Statoil	1972	Stavanger, Norway	Europe	Public
ConocoPhillips (ConocoPhillips, n.d.-a)	ConocoPhillips	1917	Houston, TX, USA	North America	Public
Petroleos de Venezuela	PDVSA	1976	Caracas, Venezuela	South America	Private
China Petroleum & Chemical Corporation (SinoPec, n.d.-a)	Sinopec	1998	Beijing, China	Asia	Public
Nigerian National Petroleum (Nigerian National Petroleum Corporation, n.d.)	NNP	1977	Abuja, Nigeria	Africa	Private
Petroliam Nasional Berhad (Petronas, n.d.-a)	Petronas	1974	Kuala Lumpur, Malaysia	Asia	Private

Company name (full)	Ownership	Multinational Operations?(number of countries)	Employees	Oil production according to Forbes (million barrels/day)	Revenues ($ million)	Profit ($ million)	Fortune Global 500 rank
Saudi Aramco (Saudi Aramco, n.d.-a)	State-owned		56.066	12.5	233.000*	---	---
OAO Gazprom (Gazprom, n.d.-a)	Majority state-owned		40.4400	9.7	157.831	44.460	15
National Iranian Oil Co. (National Iranian Oil Company, n.d.)	State-owned			6.4	---	---	---
ExxonMobil Corporation (ExxonMobil, n.d.-a)	No major shareholder	47	82.100	5.3	452.926	41.060	2
PetroChina Company Limited (PetroChina, n.d.-a)	No major shareholder		548.355	4.4	352.338	16.317	6
BP plc. (BP, n.d.-a)	No major shareholder	80+	85.700	4.1	386.463	25.700	3
Royal Dutch Shell plc. (Shell, n.d.)	No major shareholder	70+	87.000	3.9	484.489	30.918	1
Petroleos Mexicanos (Pemex, n.d.-a)	State-owned		184.090	3.6	125.344	-7.358	34
Chevron Corporation (Chevron, n.d.-a)	No major shareholder	31	62.000	3.5	245.621	26.895	8
Kuwait Petroleum Corporation (KPC, n.d.)	State-owned		17.164	3.2	103.492	7.005	---
Abu Dhabi National Oil Co. (Abu Dhabi National Oil Company, n.d.-a)	State-owned		31.000	2.9	---	---	---
Sonatrach (Sonatrach, n.d.-a)	State-owned	10	47.566	2.7	64.400	8.900	---

Total S.A. (Total, n.d.-a)	No major shareholder	130+	97.126	2.7	231.580	17.069	---
Petróleo Brasileiro S.A Petrobras (Petrobras, n.d.-a)	Majority state- owned	28	80.492	2.6	145.915	20.121	23
NK Rosneft' OAO (Rosneft, n.d.-a)	Majority state owned	Mainly Russia	161.000	2.6	65.093	12.452	137
Iraqi Oil Ministry (Iraqi Oil Ministry, n.d.)	State-owned			2.3	---	---	---
Qatar Petroleum (QP, n.d.)	State-owned	Mainly Qatar	5.001–10.000	2.3	79.500	---	---
NK Lukoil OAO (Lukoil, n.d.-a)	Majority state-owned	40+	120.300	2.2	111.433	10.357	49
Eni SpA. (Eni, n.d.-a)	No major shareholder	90	79.000	2.2	153.760	9.539	17
Statoil ASA (Statoil, n.d.-a)	Majority state-owned	35	23.000	2.1	119.561	14.055	40
ConocoPhillips (ConocoPhillips, n.d.-a)	No major shareholder	30+	16.000	2.0	237.272	12.436	9
Petroleos de Venezuela	State owned		121.187	1.9	124.754	2.640	36
China Petroleum & Chemical Corporation (SinoPec, n.d.-a)	Majority state-owned		690.000	1.6	375.214	9.453	4
Nigerian National Petroleum (Nigerian National Petroleum Corporation, n.d.)	State owned			1.4	---	---	---
Petroliam Nasional Berhad (Petronas, n.d.-a)	State owned	37	43.860	1.4	97.355	21.915	68

Management System Structure – EMS status, introductory year, and name of system

Company	Do they have an EMS?	When was it introduced?	What is the name of their ems system?
Saudi Amaco	Yes	2011 (Saudi Aramco, n.d.-b; Stapp, Katkhouda, & Reed, 2011)	EMS (Saudi Aramco, n.d.-b; Stapp et al., 2011)
Gazprom	Yes (Gazprom, n.d.-b; GAZPROM, n.d.)	1995 (ISO 2011)(Gazprom, n.d.-b; GAZPROM, n.d.)	EMS(Gazprom, n.d.-b; GAZPROM, n.d.)
National Iranian Oil Co.	No Reference	No Reference	No Reference
ExxonMobil	Yes (ExxonMobil, n.d.-b, n.d.-c)	1992 (Guédez Mozur et al., 2003)	Operations Integrity Management System (OIMS) (ExxonMobil, n.d.-b, n.d.-c)
PetroChina	Yes (PetroChina Company Limited, n.d.; PetroChina, n.d.-b, n.d.-c)	2001 (PetroChina, n.d.-b)	HSE Management (PetroChina, n.d.-c)System
BP	Yes (BP, n.d.-b, n.d.-c)	Before 1997 (ISO 14001 certificate in 1997)	Operating Management System (OMS) (BP, n.d.-b, n.d.-c)
Royal Dutch Shell	Yes (Royal Dutch Shell PLC, 2013, n.d.-a)	Before 2001 as in 2001 it had obtained some certifications	HSSE & SP management systems (Royal Dutch Shell PLC, 2013, n.d.-a)
PEMEX	Yes (Pemex, n.d.-b, n.d.-c)	Began the process in 1996	Petroleos Mexicanos Safety, Health and Environmental Protection Management System (Pemex-SSPA System) Pemex, n.d.-a, n.d.-b)
Chevron	Yes (Chevron, n.d.-b, n.d.-c)	1992 protecting people program (with a systematic approach) OEMS was introduced in 2002 replacing HES Management System	Operation Excellence Management System (Chevron, n.d.-b, n.d.-c)
Kuwait Petrol Corp	Yes (Kuwait Petroleum Corporation, n.d.-a, n.d.-b)	2003 (Kuwait Petroleum Corporation, n.d.-a)	HSE Management System (Kuwait Petroleum Corporation, n.d.-a, n.d.-b)

Abu Dhabi National Oil corp.	Yes (Abu Dhabi National Oil Company, n.d.-b)	1997. Revisions in 2002	HSE Management System (Abu Dhabi National Oil Company, n.d.-b)
SONATRACH	Yes (Sonatrach, n.d.-b)	Sonatrach started designing hse ms in 2006, 2007 they were having problems, in january 2008 journal no more mentions buttalks about implementation therefore this paper will assume that it finished designing in 2007 and started implementing in 2008 ("Invitation to submit expressions of interest HSE/Sh," n.d.) Missing Articles about system	HSE Management System (Sonatrach, n.d.-b)
Total	Yes (Total, n.d.-b)	before 2000 as by 2000 some entities had obtained certification	Environmental Management System (EMS) (Total, n.d.-b)
Petrobas	Yes (Espinosa, Azevedo, & Glitz, 2008; Petrobras, n.d.-b)	In November 1996, held-Pilot Projects Implementing Environmental Management Systems in accordance with that standard,In November 1996, held-Pilot Projects Implementing Environmental Management Systems in accordance with that standard, January 1998 the first certified according to ISO 14001 and BS 8800	HSE Management System (Espinosa et al., 2008; Petrobras, n.d.-b)
Rosneft	Yes ("Rosneft - HSSE Management," n.d.; Rosneft, n.d.-b)	Before 2007 as in 2007, Rosneft focused on further enhancing the integrated management system and adopted additional health, safety and environmental standards. ("Rosneft - Health, Safety and Environmental Protection," n.d.)	Integrated Management System
Iraqi Oil Ministry	No Reference	No Reference	No Reference
Qatar	Yes (Qatar Petroleum, n.d.-a)	No Reference	HSE management systems (Qatar Petroleum, n.d.-a)
Lukoil	Yes (Lukoil, n.d.-b; OAO Lukoil, n.d.-a)	Before 2000 (Got ISO-14001 in 2000) (Lukoil, n.d.-c)	HSE Management System (Lukoil, n.d.-b; OAO Lukoil, n.d.-a)
Eni	Yes (Eni, n.d.-b, n.d.-c)	Before 1998	Integrated Health, Safety and Environment (HSE) Management

			System (Eni, n.d.-b, n.d.-c)
Statoil	Yes (Statoil, n.d.-b, n.d.-c)	before 2002 as by 2002 some entities had obtained certification	Sustainability management system & Statoil's management system & total management system (Statoil, n.d.-b, n.d.-c)
Conocophillips	Yes ("Operating Safely - ConocoPhillips," n.d.)	Before 1996 as Philips mentions it in 1996 1997 environmental report	HSE Management System ("Operating Safely - ConocoPhillips," n.d.)
Petroleo de Venezuela	Yes (Petroleos de Venezuela, S.A. (PDVSA) y sus Filiales, 2009, n.d.-a)	Before 1995 as mentioned in 1995 report	HSE Management System (Petroleos de Venezuela, S.A. (PDVSA) y sus Filiales, 2009, n.d.-a)
SinoPec	Yes (SinoPec, n.d.-b, n.d.-c, n.d.-d)	2008	HSE management system (SinoPec, n.d.-b, n.d.-c, n.d.-d)
Nigerian National Petroleum	Yes (Nigerian National Petroleum Corporation, n.d.)	No Reference	HSE Management System (Nigerian National Petroleum Corporation, n.d.)
PETRONAS	Yes	Health, Safety & Environment Management System (HSEMS) implement in a systematic manner since 1996	HSE Management System

Ownership of companies

Category	Number of companies
Ownership	
- No major owner	8
- Majority owned by the state	6
- Wholly-owned by the state	11

When companies were founded

Category	Number of companies
Founded	
- 1870-1900	2
- 1901-1930	5
- 1931-1960	4
- 1961-1990	11
- 1991-2013	3
- Undisclosed	1

Revenues in the researched companies

Category	Number of companies
Revenues ($ million)	
- 50.000-100.000	4
- 100.001-150.000	6
- 150.001-200.000	2
- 200.001-250.000	4
- 250.001-300.000	0
- 300.001-350.000	0
- 350.001-400.000	3
- 400.000<	2
- Undisclosed	4

Public/Private distribution of researched companies

Category	Number of companies
Public/Private	
- Public	14
- Private	11

Profits of the researched companies

Category	Number of companies
Profit (in $million)	
- Not disclosed	6
- Negative figures	1
- 0-10,000	5
- 10,001-20,000	6
- 20,001-30,000	4
- 30,001+	3

Oil production of the researched companies

Category	Number of companies
Oil production (million barrels/day)	
- 1-1,9	4
- 2-2,9	11
- 3-3,9	4
- 4-4,9	2
- 5+	4

Companies rank on the Fortune 500 list

Category	Number of companies
Fortune 500 rank (place on list)	
- 1-10	7
- 11-20	2
- 21-30	1
- 31-40	3
- 41+	4

EMS in the researched companies

Do the Companies have EMS?

0 %
8 %
92 %

- Yes
- No
- No Reference
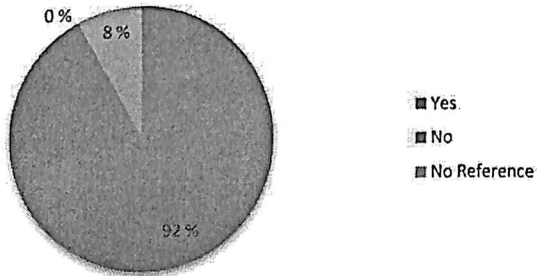
Year EMS was introduced in the researched companies

Year EMS was Introduced

16 %
16 %
4 %
8 %
16 %
40 %

- 1991-1995
- 1996-2000
- 2001-2006
- 2006-2010
- 2011+
- No Reference
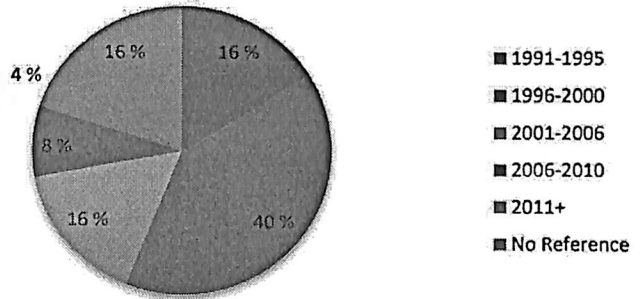
Diverging EMS titles for the researched companies

EMS Title

4 %
8 %
12 %
8 %
12 %
56 %

- EMS
- HSE MS
- Operating MS
- Other Integrated MS
- Sustainability MS
- No Reference
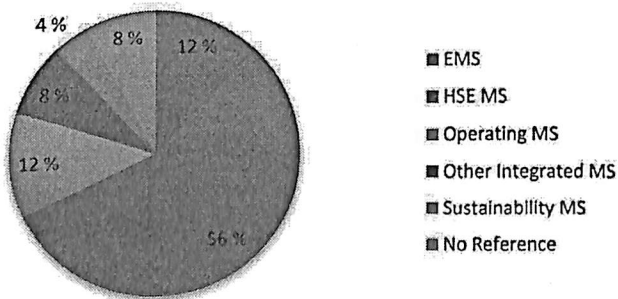
Integration of EMS

Is the Company EMS Integrated

8 %
12 %
80 %

- Only EMS referenced
- Integrated
- No Reference
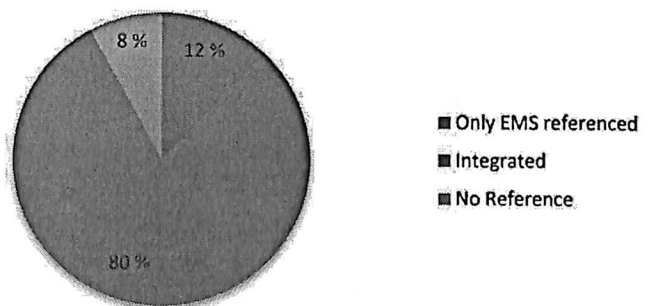
Components of EMS integration

Company EMS Integration Components

4 %
4 %
4 %
4 %
4 %
8 %
13 %
59 %

- No Reference
- Only Environmental Management
- Health, Safety and Environment
- Safety, Security, Health, Environmental and Social Risks
- Health, Safety, Security, Environment and Operation Risks
- Health, Safety, Security, Environment (HSSE) and Social Performance (SP)

89
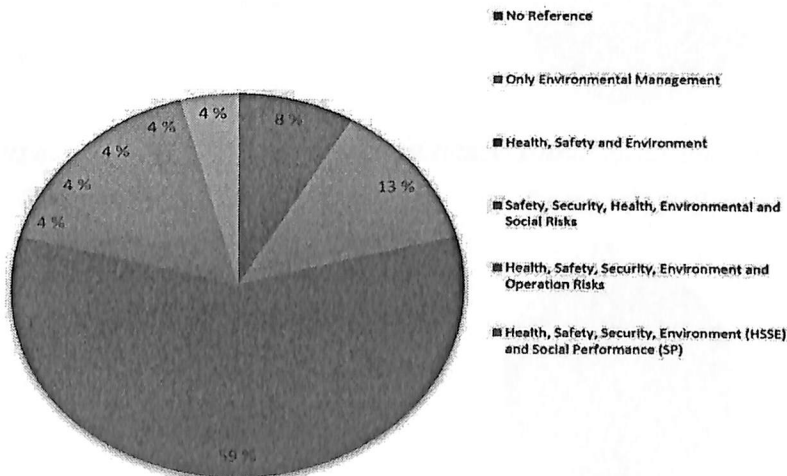
Scope of the EMS systems – number of companies and type of scope
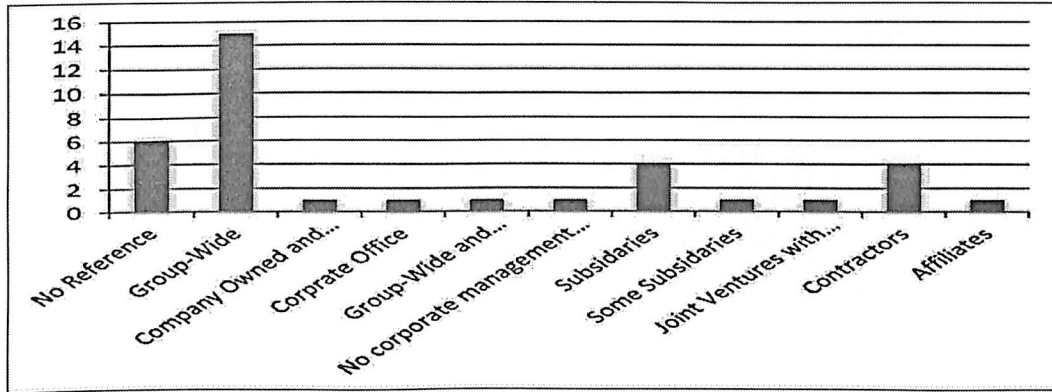
Use of ISO 14001

Use of ISO 14001

28 %
72 %
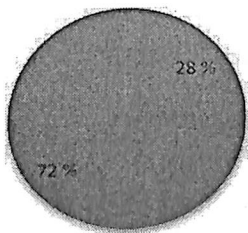
- No Reference
- Yes

Use of EMAS

Use of EMAS

4 %
96 %
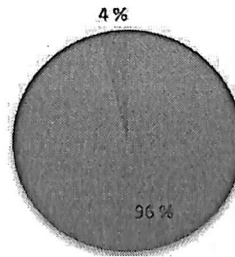
- No Reference
- Yes

Use of BS 8850

Use of BS 8850

4 %
96 %
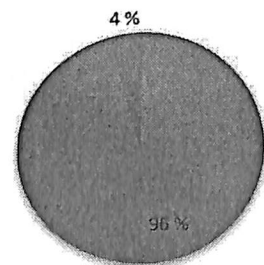
- No Reference
- Yes

Use of BS 7750

Use of BS 7750

0 %
100 %
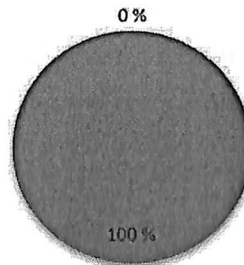
- No Reference
- Yes

Researched companies compatible, certified and non-certified according to ISO 14001

Compatible & Certified

4 %
20 %
40 %
16 %
20 %
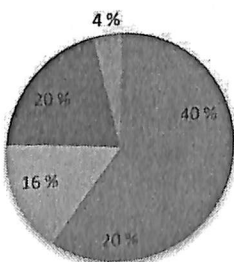
- Yes
- No
- No Reference
- Unclear
- No Corporate EMS

Compatible & not Certified

4 %
20 %
44 %
16 %
16 %
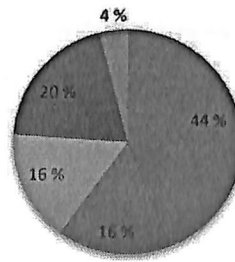
- Yes Corporate
- No Corporate
- No Reference
- Unclear
- No Corporate EMS

90

Use of National Standards

- No Reference
- Yes

48 %
52 %
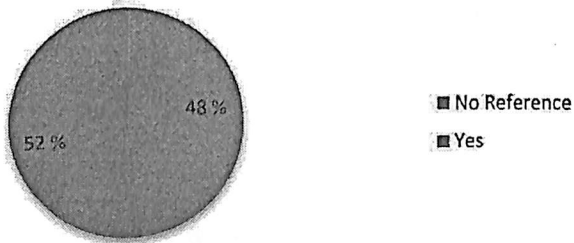
Use of International Standards

- International Standards
- No Reference

12 %
88 %
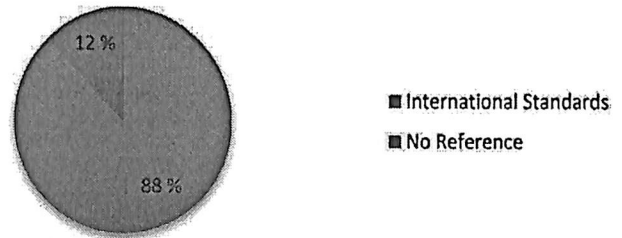
Use of APIs Model Environmental, Health and Safety (EHS) Management System and Guidance Document

- No Reference
- Yes

28 %
72 %

No. of Management System Elements
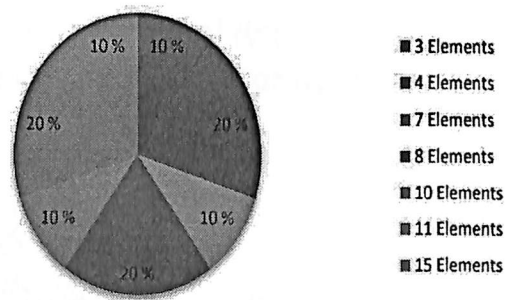
- 3 Elements
- 4 Elements
- 7 Elements
- 8 Elements
- 10 Elements
- 11 Elements
- 15 Elements

10 % 10 %
20 % 20 %
10 % 10 %
20 %

EMS Structure

- Elements
- Elements and Requirements
- Element Systems with subelements
- One Base Element System with additional element systems and further sub elements

20 %
40 %
10 %
10 %
20 %

91
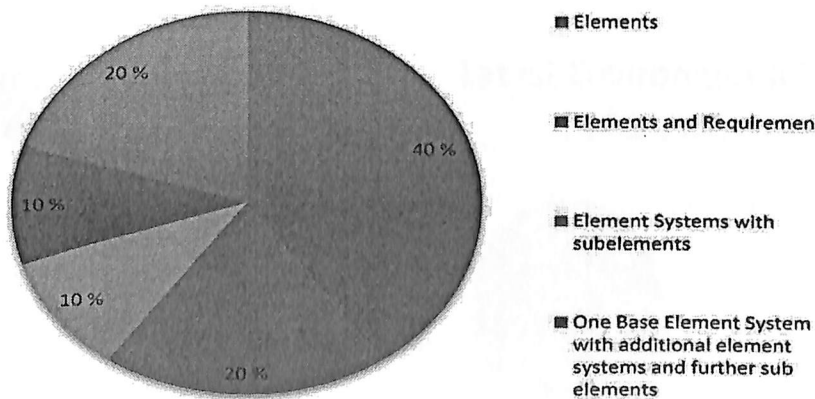
Latest Environmental Reports among the Common & Industry-wide Companies

Latest Environmental Reports: Inclusion of Environmental Policy

0 %

18 %

82 %

- Yes
- No
- No Environmental Reports
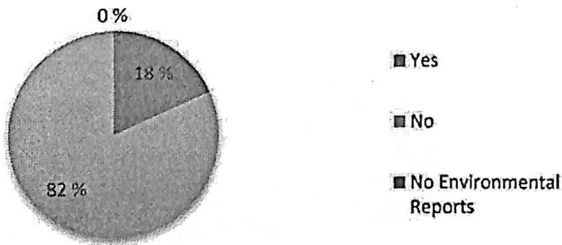
Latest Environmental Report: Inclusion of Environmental Policy

20 %

20 %

60 %

- No Environmental Report
- Yes
- No
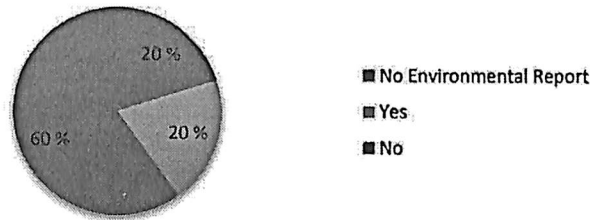
Latest Environmental Reports (Common & Industry-wide Companies) based on Code of Conduct

Latest Environmental Reports: Reference to Code of Conduct

0 %

9 %

91 %

- Yes
- No
- No Environmental Report

Latest Environmental Reports: Reference to Code of Conduct

20 %   20 %

60 %

- No Environmental Report
- Yes
- No
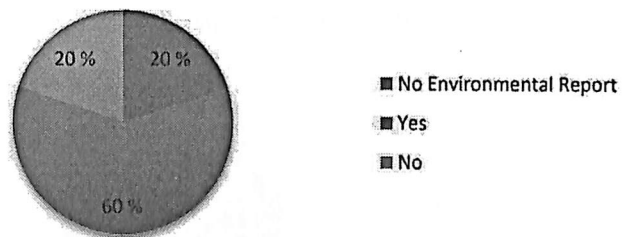
Latest Environmental Reports (Common & Industry-wide Companies) with Reference to EMS

Latest Environmental Report: Reference to EMS
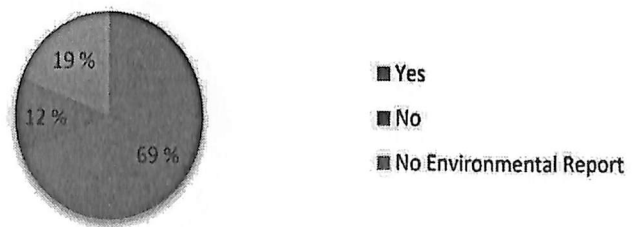
0 %

27 %

73 %

- Yes
- No
- No Environmental Report

Latest Environmental Reports: Reference to EMS

19 %

12 %

69 %

- Yes
- No
- No Environmental Report

92

Latest Environmental Reports:
Type of EMS

- EMS
- HSE MS
- Operating MS
- Other Integrated MS
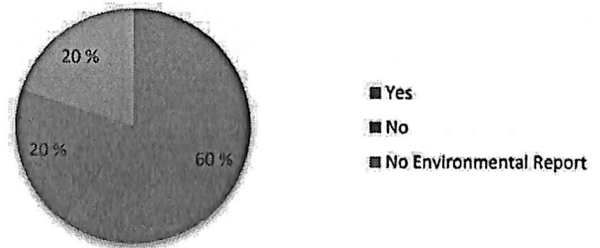- Sustainability MS
- No Reference
- No Environmental Report
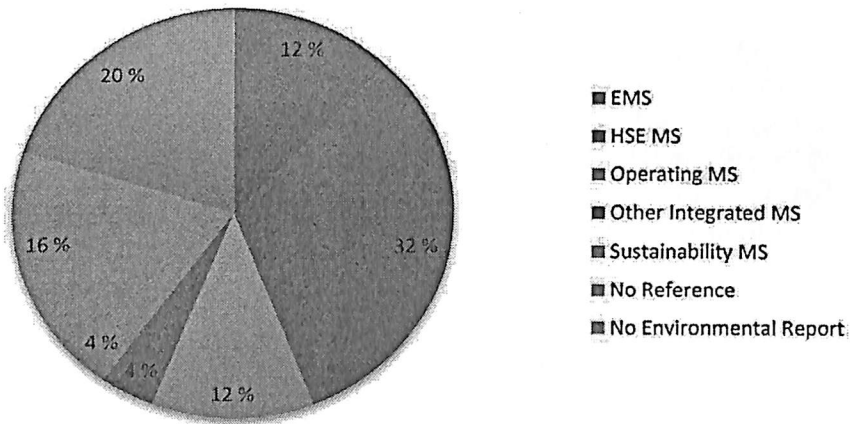
Latest Environmental Reports (Common & Industry-wide Companies) with Reference to ISO 14001

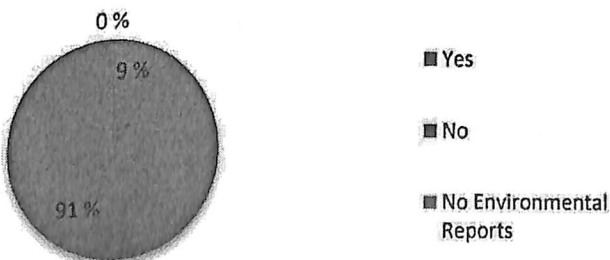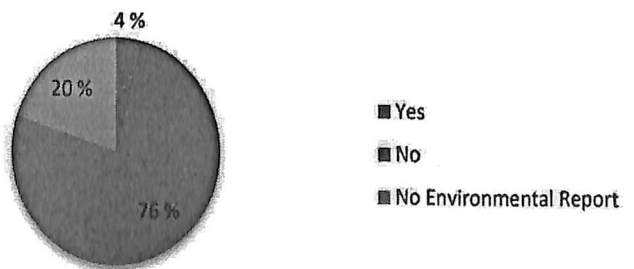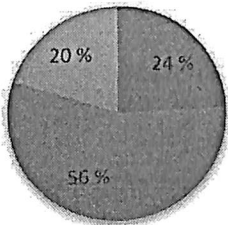## Latest Environmental Reports:
Reference to ISO 14001

- Yes
- No
- No Environmental Reports

Latest Environmental Reports:
Reference to ISO 14001

- Yes
- No
- No Environmental Report

Latest Environmental Reports (Common & Industry-wide Companies) with Reference to EMAS

Latest Environmental Reports:
Reference to EMAS

- Yes
- No
- No Environmental Reports

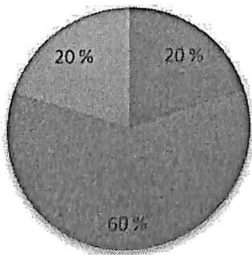## Latest Environmental Reports:
Reference to EMAS

- Yes
- No
- No Environmental Report

93

Latest Environmental Reports: Reference to ISO 9001

20 %
24 %
56 %

■ Yes
■ No
■ No Environmental Report

Latest Environmental Reports: Reference to OHSAS 18001
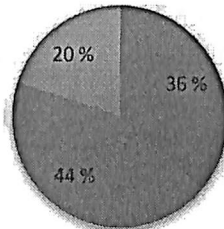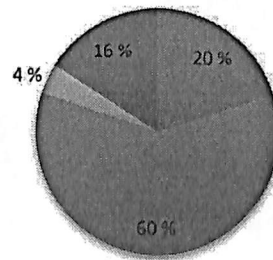
20 %
36 %
44 %

■ Yes
■ No
■ No Environmental Report

Latest Environmental Reports Industry-wide Companies
Reference to Audit Programme & Verification
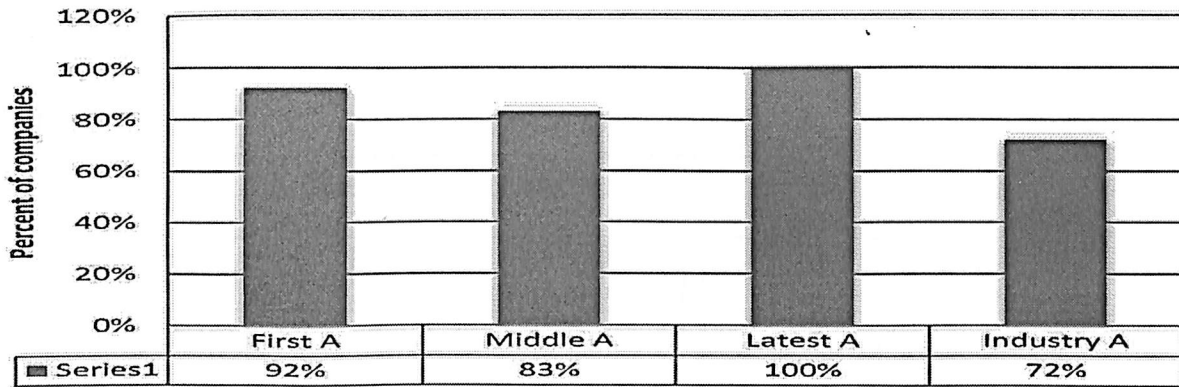
Latest Environmental Report: Audit Programme

20 %
20 %
60 %

■ No Environental Report
■ Yes
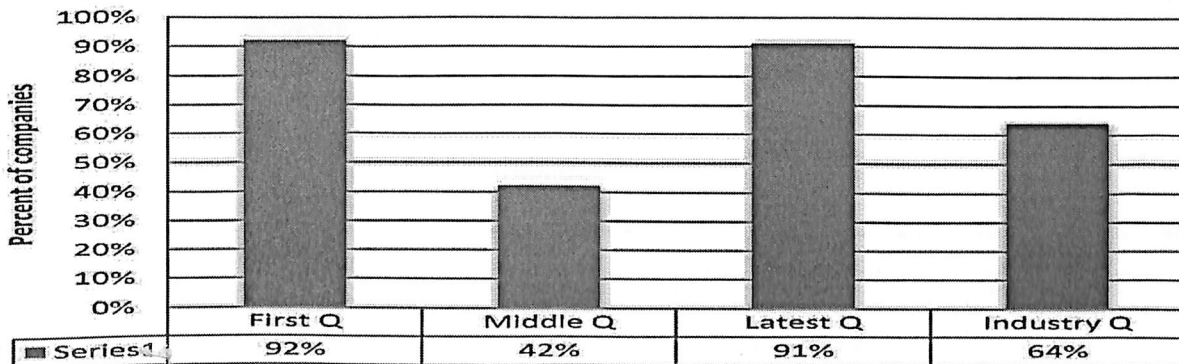■ No Reference

Latest Environmental Reports: Verification

4 %
16 %
20 %
60 %

■ No Environental Report
■ Yes
■ No
■ No Reference

Environmental Performance Indicators: Atmospheric

	First A	Middle A	Latest A	Industry A
Series1	92%	83%	100%	72%

Environmental Performance Indicators: Aquatic

	First Q	Middle Q	Latest Q	Industry Q
Series1	92%	42%	91%	64%

Environmental Performance Indicator: Terrestrial

	First T	Middle T	Latest T	Industry T
Series1	92%	50%	82%	56%

Environmental Performance Indicators: Type F

Series1	First F	Middle F	Latest F	Industry F
	17%	17%	100%	72%

Y-axis: Pe cent of companies (0% to 120%)

Environmental Performance Indicators: Type T

Series1	First T	Middle T	Latest T	Industry T
	33%	0%	0%	8%

Y-axis: Percent of companies (0% to 35%)

Environmental Performance Indicators: Type C

Series1	First C	Middle C	Latest C	Industry C
	83%	67%	100%	72%

Y-axis: Percent of companies (0% to 120%)

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