SCRUTINIZING ENVIRONMENTAL PROTECTION ISSUE THROUGH A CASE STUDY: AN EVIDENCE FROM PETROCHEMICAL COMPANY

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ABSTRACT: *This article discusses the use of the case study method in the qualitative research paradigm by providing novel insights into the role of a petrochemical company towards environmental protection solutions. A single case study was conducted in one of the leading petrochemical companies in Malaysia. A pseudonym is used to describe the company, which is referred to as 'Company A'. The findings indicate that the current green corporate social responsibility (CSR) practice through EMS ISO14001 in Company A is the answer to protect the environment as a response to multiple stakeholders' demands nowadays.*

Keywords: environmental, petrochemical, Green CSR

INTRODUCTION

The rapid socio-economic growth and progress in Malaysia have given rise to tremendous environmental impact [1] on the river [2;3], which affects the aquatic environment of the country [4]. Moreover, food and beverage, chemical and petrochemical, palm oil, textile, paper, and rubber processing industries tend to be the major sources of industrial pollution in Malaysia [5]. Businesses not only give a positive impact on the development of Malaysia but also give a negative impact on the environment. However, it shows that the environmental harms brought by the Malaysian manufacturing industry resulted in destructive effects on the economy, environment, and social sustainability [6]. Proper implementation of green practices is needed in assisting companies towards corporate green sustainability initiatives [7].

Problem Statement

Industries play a role in contributing to the alarming rate of pollution as they involve chemicals in their operations. In January 2006 ammonia gas affected the residents of Kampung Sungai Gautam, Labis Johor when it was illegally dumped along the banks of Sungai Gautam. The ammonia gas was about 200 parts per million (ppm) within a radius of 200m, exceeding the safe level of less than 25ppm. As a result, the Department of Environment (DOE) issued a directive notice under Section 31 of the Environmental Quality Act 1974 to the contractor and landowner involved in the dumping act. In September 2013, 4,000 liters of used engine oil was dumped into a Selangor river by the factories nearby and caused water supply disruptions to one million customers in the Klang Valley. Recently, on 24 July 2018 authorities ordered three plastic factories in Kuala Langat to close due to pollution (www.malaymail.com). Incidents like these prompt questions such as: "Why are these industries rampantly engaged in such unethical conduct? Why are they harming people? What are the legitimate actions taken by the companies to protect the environment? Why do they not fulfill their social responsibility towards protecting the environment?

To understand the current green CSR practices, the present study employed a case study method at one leading petrochemical company in Malaysia (known as company A).

Research question

Through the literature review, the following research question is developed:

QI: How the company responds to the environmental pollution issue with regards to green CSR practice?

Research Method: A single case study

To answer question 1, qualitative methodology is most commonly applied when phenomena are insufficiently understood [8]. According to Corbin and Strauss [9], qualitative research allows researchers to get at the inner experience of a participant, to determine how meanings are formed through and in a culture, and to discover rather than test variables. The case study method is defined as "A case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context is not evident" [10].

Case description: 'Company 'A'

A case study was conducted in one of the leading petrochemical companies in Malaysia. A pseudonym is used to describe the company, which is referred to as 'Company A'. Below is the description of Company A profile:

Background	Established in 1997, Chemicals Group-wide Berhad (later referred to as the group-wide entity) was created to add value to the national natural gas resources and surplus hydrogen for Malaysia. It is one of Malaysia's national oil company subsidiaries and wholly-owned by the Government. Company A is part of the national, group-wide entity conglomerate, serving as the leading integrated producer of chemical products in Malaysia and one of the largest in South East Asia. Situated on the east coast of peninsular Malaysia, Company A and their group-wide entity operate several world-class production sites, which are fully vertically integrated from feedstock to downstream end-products. Company A and the group-wide entity are ranked amongst the largest companies in the world with a proven track record in integrated oil and gas operations. As one of a big conglomerate, Company A and the group-wide entity is Malaysia's integrated petroleum multinational corporation with a strong ranking on the Fortune Global 500® with a presence in more than 30 countries around the world. Listed on Bursa Malaysia and with nearly three decades of experience in the chemical industry, Company A and the group-wide entity are established to maximize the value from Malaysia's natural gas resources and act as an important manufacturer for the chemical industry. The parent company of Company A and the group-wide entity first ventured into the production of certain basic petrochemical products in the mid-1980s and later embarked on several large-scale petrochemical projects with multinational joint venture partners. Company A and the group-wide entity's joint venture partners include The Dow Chemical Company, BASF Netherlands BV, BP Chemicals, Idemitsu Petrochemical Co Ltd, Mitsubishi Corporation, and Sasol Polymers International Investments (Pty) Ltd.
Product	As the leading integrated chemical producer in Malaysia with a total combined production capacity of over 10 million metric tonnes per annum (mtpa), Company A and the group-wide entity involve primarily in manufacturing, marketing, and selling a diversified range of chemical products, including ammonia commercially, as well as supplying carbon monoxide (CO) and oxogas (a mixture of hydrogen and CO), olefins, polymers, fertilizers, methanol, and other basic chemicals and derivative products.
Activity	Company A and the group-wide entity market a broad range of chemical products to over 30 countries globally with the key focus on South East Asia and the Asia Pacific. Major markets outside Malaysia include Indonesia,

	the Philippines, Singapore, Thailand, and Vietnam as well as China, Japan, South Korea, Taiwan, Australia, New Zealand, and India. The integrated development of Malaysia's petrochemical industry is expected to promote the development of the country's industrial base, especially the plastics and chemical-based component manufacturing industry. The Company's consolidated petrochemical business under Chemicals Group Wide Berhad is the largest integrated petrochemical producer in Malaysia and among the largest in South East Asia. The Group also maintains its market reach with 60% revenue derived from outside Malaysia, particularly Asia. The domestic market contributes to the remaining 40% of their revenue, further establishing the leadership position as Malaysia's largest olefins manufacturer and the sole producer of methanol and urea. Company A's operation comprises a diverse portfolio of chemical products that are sold both domestically and internationally. This company is a petrochemical plant. In 2012, Company A and the group-wide entity took significant undertakings including large petrochemical investments, the Refinery and Petrochemicals Integrated Development (RAPID) project and Sabah Ammonia Urea (SAMUR), the construction of the Sabah Oil and Gas Terminal, Malaysia's first regasification terminal, and two Floating Liquefied Natural Gas projects.
Contribution to economic growth	In the 38 years of the group-wide entity stewardship, the domestic oil and gas industry has become the mainstay of the country's economy, contributing approximately 15% – 20% of Malaysia's GDP. As a leading integrated petrochemicals producer in Malaysia and one of the largest in South East Asia, Company A and the group-wide entity are the listed holding entity for all parent company petrochemical production, marketing, and trading subsidiaries and have a total combined production capacity of over 11 million tonnes per annum. In the last five years alone (2009-2013), the group-wide entity has contributed an average of 41% of total revenue collected by the Government.

The rationale for choosing a single case study at Company A

Company A was chosen as a case to be studied in the present research for five reasons, discussed below. Firstly, even a single case can contribute significantly contribute to knowledge and theory building. Previous studies have focused on examining the drivers for green purchase adoption among EMS 14001 certified companies in Malaysia [11]; perceived benefits derived from ISO14001 registrations for firms in a newly industrialized country like Malaysia [12]; linking the adoption of an EMS ISO14001 with value-based thinking and sustainability [13]; describing the underlying structure of the ISO 14001 motives, difficulties and benefits and determining the respective latent constructs [14]; investigating how a group of companies has developed a pattern to design a sustainable supply chain based on several requirements, including ISO 14001 [15]; providing an immediate image about the reality of the EMS as experienced by Algerian certified ISO 14001 companies [16]; and the effect of ISO 14001 on environmental regulatory compliance in China [17].

By investigating current CSR practices (i.e. EMS ISO14001 internal process) in Company A towards environmental protection, the case study method has allowed the researcher to add to the existing literature and offered a

model of CSR practices in a chemical company. Even though previous research has indicated the importance of EMS ISO14001 towards environmental protection (EP), very few focused on "how" EMS ISO14001 internal process leads to EP. Such study is very important so that the academics and practitioners benefit from the in-depth process employed at one leading petrochemical company in Malaysia.

Secondly, Company A was chosen because the case represented an extreme or unique case. Problem-solving will only be found by investigating a single case study. This was achieved by examining the CSR green practices through EMS ISO14001 in Company A, which could not be possible if the study were to be conducted in any type of company. It was also noted that the growth of multinational companies operating all over the world has contributed to a growing demand for CSR especially on certain areas such as human rights and the environment [18-19].

Thirdly, a single case study was employed in Company A because it was 'representative' of a 'typical case'. Company A is one of the big conglomerates of 25 chemical companies in Malaysia. The governance, green practice, and EP objective of Company A and other group-wide entities are similar. Therefore, as mentioned by Yin [10], Company A was 'representative' of a 'typical case'. Thus, the everyday circumstances in Company A and group-wide entity could be said to be similar. Additionally, a manufacturing firm is typical of other manufacturing firms within the same industry. A chemical company that produces Ammonia, Carbon dioxide, and Oxogas has therefore similar manufacturing activities. Furthermore, how Company A manages its scheduled wastes ethically represents its social responsibility towards EP in Malaysia.

Fourthly, the single case was conducted in Company A because it was a revelatory case. This situation existed when the researcher had an opportunity to observe and analyze a phenomenon previously inaccessible to scientific observation. The case study was therefore worth conducting because the "first-hand" information would be revelatory. Consequently, the CSR implementation through EMS ISO14001 process could only be revealed when the researcher had the chance to do an in-depth interview, observation, and detailed document analysis in Company A.

Lastly, a single case involves a prolonged engagement and persistent observation in the field" [8]. During the data collection process, the researcher managed to be engaged in the field and made observation by doing the following:

1) Building trust with participants (e.g., refer to key informant no 1, no 2, and no 3 in Company A)
2) Learning the organizational culture in Company A. The researcher observed how they worked and communicated with the employees. The researcher even participated in Company A's weekly meeting as well.
3) Checking for misinformation that could stem from distortions introduced by the researcher and informants. The way of doing this was by using a triangulation method (observation, interviews, and document reviews).
4) Making a decision about what was salient to the study, relevant to the purpose of the study, and of interest. For example, the researcher conducted three preliminary studies, and confirmed and validated the research framework with the key informants in Company A. Then during the in-depth interview sessions, the researcher only focused on understanding what was salient to the study only (e.g., EMS ISO14001 step-by-step process).

In all, the researcher took more than seven months conducting interviews, making observations, and analyzing the documents in Company A to address the objectives of the study. Thus, Company A was deemed to be the most relevant in helping us understand the CSR practices and green process towards EP in Malaysia based on the criteria described above. (see figure 1)

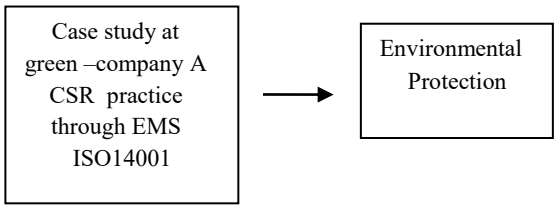

Figure 1: Green CSR practice in Company A
Source: Author

More importantly, previous researches have employed a case study method to understand the impact of business activities on the environment. For instance, Sambasivan and Fei [20] did a case to evaluate the critical success factors of implementing ISO 14001 using analytic hierarchy process; Ardente et al. [21] applied a case study methodology to examine the direct and indirect environmental effect on the life-cycle approach implemented within a small wine-producing firm; Cellura [22] implemented a case study method on the environmental assessment of protected crops districts in the south of Italy; Pun and Hui [23] adopted a qualitative case study methodology to understand and explain the

procedural guideline of a seven step-by-step EMS ISO14001 approach to managing a construction practice; and Aiyub [24] discussed ISO 14001 implementation in Malaysia's manufacturing sector on drivers, benefits, obstacles, and implications. In short, a case study was adopted by previous scholars to gain novel insight into the practical conduct of companies towards responsible green initiatives on environmental protection.

Results and Discussion

Environmental Management System (EMS) ISO14001: Document-based Procedure and Practice

Figure 2 explains step-by-step EMS ISO 14001 practices in Company A which contribute to the environmental protection in Malaysia. The EMS is a management system put in place to protect the environment. Although the EMS subscribes to ISO 14001, which is a structured approach to address health, safety, and environmental issues, this study solely focuses on the green practice on the environment. Because EMS ISO14001 is based on Company A's real practice, the process could be best described by key informant no 1 and key informant no 3, as shown below:

Key informant no 1:

"...We can tackle all issues in a systematic approach. Meaning not every day we need to enforce the procedures. In the end, we do hope everybody will play their role, contribute to the system so it can run simultaneously with the company's objective on environmental protection..."

Key informant no 1:

"...So, the issue will be tackled in terms of a 'holistic approach, and more towards governance. Meaning, people do not have a chance to cheat, because all/every element of the system (ISO 14001) have been audited and monitored. So it's all on cultivating voluntary responsibilities among employees..."

Key informant no 3:

"By having EMS and certified bodies like SIRIM to monitor our system, we have to comply with the requirements, and of the requirement are resources and responsibilities of the top management. By having that (EMS) we have a platform to support the management"

Key informant no 3

"...EMS is directly related to ISO14001 standard and, yes, when we talk about EMS, it is actually related to the understanding of ISO 14001 globally. Because it is a globally accepted system which controls or governs our environmental management system..."

The green practices implemented based on the documentation of EMS ISO14001 in environmental protection are captured as follows:

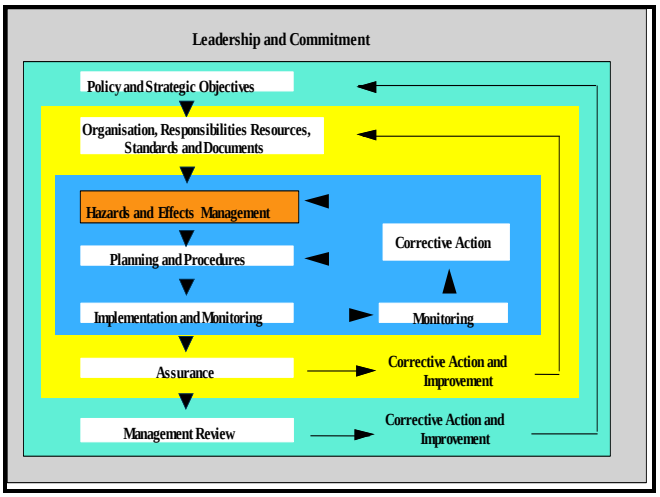

Figure 2: EMS ISO 14001 green practice in Company A
Source: Company A's documents

Figure 2 depicts the process of EMS ISO 14001 in Company A. This study focuses on scheduled wastes management as an example to explain the process involved. Company A embraces the EMS framework as the methodology to identify environmental hazards produced in its daily operations. Environmental hazards refer to effluents, emissions, schedule wastes, land pollution, etc. This section onwards looks at the whole document of EMS ISO14001.

The cycle of activities can be understood as follows:
(1) the company first commits to an environmental policy, then uses its policy as a basis to establish a plan, which sets the objectives and the targets to improve its environmental performance; (2) the next step is implementation. After that, the company; (3) evaluates its environmental performance to see whether the objectives and targets have been met; if (4) targets were not met, corrective action is taken. The result of this evaluation is then; (5) reviewed by top management to see if the said EMS framework is working. The Management later revisits the environmental policy and sets new targets in a revised plan. The company then implements the revised plan. The cycle repeats and continuous improvement occurs.

Key informant 1 later verified that EMS ISO14001 is a core activity of green practice of Company A:
"EMS is improving the process from time to time because the nature of the product is risky so that's why we have undergone monitoring, auditing, and a certification process which is tight and comprehensive"

CONCLUSIONS

In summary, a proactive effort towards reducing daily scheduled wastes emission at the plant leads Company A to strongly support the company's environmental responsibility initiatives. This is done by engaging the

Environmental Management System (EMS) ISO14001 framework that helps the company to achieve its environmental goals through consistent control of its operations. The assumption is that this increased control will improve the environmental performance of the company. The EMS itself does not dictate a level of environmental performance that must be achieved; each company that engages the EMS framework is free to tailor its business and goals to make a profit and benefit the people and the planet at the same time. Thus, under EMS ISO 14001, the system encourages the company to continuously improve its environmental performance.

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REFERENCES

[1] Hezri, A. A. and Hassan, M.N. 2006. Towards sustainable development? The evolution of environmental policy in Malaysia. *Natural Resources Forum*. (30): 37–50.

[2] Tan, S. G., & Yap, C. K. (2006). Biochemical and molecular indicators in aquatic ecosystems: current status and further applications in Malaysia. *Aquatic Ecosystem Health & Management*, *9*(2): 227-236.

[3] Al-Shami, S. A., Rawi, C. S. M., HassanAhmad, A., & Nor, S. A. M. (2010). Distribution of Chironomidae (Insecta: Diptera) in polluted rivers of the Juru River Basin, Penang, Malaysia. *Journal of Environmental Sciences*, *22*(11): 1718-1727.

[4] Hajeb, P., Jinap, S., Ismail, A., Fatimah, A.B., Jamilah J. and Rahim, M.A. 2009. Assessment of mercury level in commonly consumed marine fishes in Malaysia. *Food Control*. 20(1): 79–84.

[5] Iyagba M. A., Adoki A. and T.G. Sokari. 2008. Testing biological methods to treat rubber effluent. *African Journal of Agricultural Research*. 3(6): 448-454.

[6] Hassan, M. G., Abidin, R., Nordin, N., & Yusoff, R. Z. (2016). GSCM practices and sustainable performance: A preliminary insight. *Journal of Advanced Management Science*, 4 (5): 430-434

[7] Plan, E. M. (2015). Chapter 6: Pursuing green growth for sustainability and resilience. In. Polonsky, M. J. (2011). Transformative green marketing: Impediments and opportunities. *Journal of Business Research, 64*(12): 1311-1319.

[8] Creswell, J.W. (2007). Qualitative Research Inquiry and Research Design: Choosing Among Five Approaches. Second Edition. Thousand Oaks, California: Sage

[9] Corbin, J., and Strauss, A. (2008). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (3rd ed.). Thousand Oaks, CA: Sage Publications

[10] Yin, R. K. 2009. *Case study research: Design and methods*. 4th ed. Thousand Oaks, CA: Sage Publications.

[11] ElTayeb, T.G., Zailani, S. and Jayaraman, K. (2010). The examination on the drivers for green purchasing adoption among EMS 14001 certified companies in Malaysia. *Journal of Manufacturing Technology Management*. 21(2): 206 – 225.

[12] Tan, L. P. (2005). Implementing ISO 14001: is it beneficial for firms in newly industrialized Malaysia?. *Journal of Cleaner Production*, *13*(4): 397-404.

[13] Petros Sebhatu, S., & Enquist, B. (2007). ISO 14001 as a driving force for sustainable development and value creation. *The TQM Magazine*, *19*(5): 468-482.

[14] Psomas, E. L., Fotopoulos, C. V., & Kafetzopoulos, D. P. (2011). Motives, difficulties and benefits in implementing the ISO 14001 Environmental Management System. *Management of Environmental Quality: An International Journal*, *22*(4): 502-521.

[15] Chiarini, A. (2012). Designing an environmental sustainable supply chain through ISO 14001 standard. *Management of Environmental Quality.* 24(1): 16 – 33

[16] Hariz, S. and Lylia Bahmed, L. (2013). Assessment of environmental management system performance in the Algerian companies certified ISO 14001. *Management of Environmental Quality: An International Journal.* 24(2): 228 – 243.

[17] McGuire, W. (2014). Analysis The effect of ISO 14001 on environmental regulatory compliance in China. *Ecological Economics*. (105) : 254–264.

[18] Husted, B. W., & Allen, D. B. (2006). Corporate social responsibility in the multinational enterprise: Strategic and institutional approaches. *Journal of international business studies*, *37*(6): 838-849.

[19] Arevalo, J. A., & Aravind, D. (2010). The impact of the crisis on corporate responsibility: the case of UN global compact participants in the USA. *Corporate Governance: The international journal of business in society*, *10*(4): 406-420.

[20] Sambasivan, M., & Fei, N. Y. (2008). Evaluation of critical success factors of implementation of ISO 14001 using analytic hierarchy process (AHP): a case study from Malaysia. *Journal of cleaner production*, *16*(13): 1424-1433.

[21] Ardente, F., Beccali, G., Cellura, M., & Marvuglia, A. (2006). POEMS: a case study of an Italian wine-producing firm. *Environmental management*, *38*(3): 350-364.

[22] Cellura, M., Ardente, F., & Longo, S. (2012). From the LCA of food products to the environmental assessment of protected crops districts: a case-study in the south of Italy. *Journal of environmental management*, *93*(1), 194-208.

[23] Pun, K. F., & Hui, I. K. (2001). An analytical hierarchy process assessment of the ISO 14001 environmental management system. *Integrated Manufacturing Systems*, *12*(5): 333-345.

[24] Aiyub, K A. (2007). *ISO 14001 implementation in Malaysia's manufacturing sector: drivers, benefits, obstacles and implications*. Doctoral dissertation, University of East Anglia. See also URL http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.435976.