The Economic Impact of Green Marketing on Petroleum Residues: Theoretical and Analytical Study

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Abstract--- The current business climate gravitates towards products/services that are least harmful to the environment. This is due to several factors, chiefly among them being the increasing temperature and degradation of the environment. Green marketing aspires to serve customers at minimal cost to the environment. This study intends to elucidate the economic impacts of waste recycling and green marketing on the Iraqi oil industry. In order to realize the objective of this study, a questionnaire system was distributed to Chinese oil company personnel for the collection of primary data. The consisted of 55 samples, with only 31 of them valid for statistical analysis. The arithmetic mean, standard deviation, coefficient of variation, and multiple regression analyses were estimated and duly discussed in this paper. The analytical data confirmed the significant effect of the recycling process on green marketing of the company. It is recommended that companies pay attention to both recycling and staff development.

Keywords--- Residues Recycling, Petroleum Industry, Green Marketing.

I. Introduction

The ubiquity of petroleum products in the market resulted in the generation of significant amount of waste products that are detrimental to the environment. Limited natural resources also necessitate its use in a more effective and efficient manner. Industrial waste has the potential for reuse, and its management is of crucial importance to companies and the environment[1].The oil industry is also acutely aware of its negative image due to mismanagement of waste and environmental problems precipitated by its practices in production, processing and marketing of petroleum products[2].

The rapid growth of the global population and exponential increase of energy consumption require resources such as food, minerals, and energy. However, increased exploitation and use of these resources are detrimental to the environment. Some major issues associated with this include global warming, pollution of water, land, and sea, and the destruction of natural habitats. The recently resurgent developing economies play a role in increasing the consumption of energy and fossil fuels[3].

The field of waste management is plagued with ever increasing amount of waste generated from multiple industries. They also need to control for the negative effect of these wastes to mitigate serious environmental problems. There are many mathematical models that are currently used to analyze treatments of hazardous wastes via physico-chemical and thermo-biological processes[4].This also includes approaches such as linear programming, dynamic programming, and network models, all of which have been used to optimize waste management logistics, encompassing optimizing location and facility sizes of hazardous/non-hazardous wastes. The management of logistics in hazardous wastes is governed by multiple goals, such as community and environmental control, both of which are characterized by diverging priorities [5].

Green marketing is currently being studied by many researchers due to its increasing usage in multiple marketing approaches tasked with attracting global consumers. The implementation of the green concept by companies in its products and services, distribution, and promotion has been closely researched, especially in the context of its environmental impact on customers [6].Grant[7]pointed out that decisions pertaining to green and marketing principles might come into conflict with one another; decisions favoring green policies would reduce consumption, while decisions favoring marketing encourages customers to increase consumption. The amalgamation of both principles would result in increased utilization of green marketing. He makes a point that it is imperative that decisions be made by taking into account its (positive) impact on both the environment and the markets. According to [8],the first green marketing technique involve recycling waste generated from product usage. However, it was

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later reported by the author that green marketing needs to realize sustainable growth for the company via environment friendly products. In this context, marketers are required to strategically promote their product to guarantee maximum customer coverage. This remains the most distinguishable aspect of common and green marketing. The latter is an opportunity for organizations to be rewarded by introducing environment friendly products/services. Customers can become more savvy in their choice of purchase [9].Focusing on the emotional aspect of a customer by convincing them of a specific benefit afforded to them via purchasing a product is a common way to attract customers. This approach can also be used for green marketing, by way of offering customers the 'feel good' factor of helping the environment via purchasing a specific product. Baker and Sinkula [10]are regarded to be the pioneer of green marketing. Their work began by researching the impact of green branding on hospitality consumers. This was expanded upon by Nyilasy et al [11],who elucidated the actual relationship between environmental branding and consumers' purchasing behavior. Mead et al.[12]posited that current consumers are 5 times more concerned relative to consumers from a decade ago vis-à-vis environmental issues, which makes it beneficial for companies to change their respective logos to represent green efforts and themes. Hahnel[13]reported important attributes pertaining to green marketing, classifying environmental marketing into three categories, one of them being green marketing. According to Hahnel [13], green marketing aim to maximize profits. Green marketers adhere to common marketing strategies and introduce products to the market that are environmentally friendly. This basically targets environmentally aware customers. The impact of green marketing was analyzed by D'Souza and Taghian [14], who posited that it could be useful in the hands of modern day entrepreneur who want innovative advertising, distribution, promotion, and selling in the context of green marketing. Leonidou and Leonidou[15]believes that not only marketing is becoming more creative, customers are also becoming more aware of critical environmental issues plaguing the planet. The strategy of appealing to their environmental consciousness could work quite well and positively impact the environment and the global marketplace.

This research discusses the impact of the green marketing philosophy of recycling residues in order to maintain environmental health and develop petroleum industries, and the enhancement of the link between the recycling process and green marketing philosophy facing problems affecting the environment.

II. Theoretical Framework

This section outlines the concept, importance, objectives, strategical dimensions, and limitations pertaining to recycling residues. The historical development, concept, importance, and economical dimensions of green marketing philosophy will be touched upon as well.

2.1. Residues Recycling

2.1.1. Recycling Concept

Recycling is defined as converting wastes into usable materials. Recycling forms an alternative to traditional waste disposal, enabling the decrease of waste accumulation and greenhouse gas emissions. It also helps eschew wasting potentially useful materials while also reducing the use of fresh materials, all of which results in decreased energy usage, air pollution (from incineration), and water pollution (from land filling). Recycling remains one of the key aspect of modern waste management, and is the third component in the "Reduce, Reuse, and Recycle" hierarchy[16].In short, recycling intends to affect environmental sustainability via the replacement of raw materials with those coming from waste outputs[17].

2.1.2. Importance of Recycling

The environmental, economic, and social benefits of recycling are:

- Protect the environment from damage waste disposal.
- Reduce water related pollution.
- Protect the atmosphere from greenhouse gas emissions.
- Decrease the usage of raw mineral resources while realizing sustainability for future generations.
- Obtaining economic returns and profits while also decreasing the rate of unemployment.

2.1.3. Recycling Objectives

Recycling aims to achieve its objectives via four main categories:

- Education programs to improve the performance of personnel in oil companies.
- Collecting raw materials using the accumulation method from their original sources extracted from oil wells.
- Produce and sell recycled raw sources.

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2.1.4. The Strategic Dimensions of Recycling

The strategy dimensions and its positive impact(s)on recycling industrial waste is shown in Figure 1.

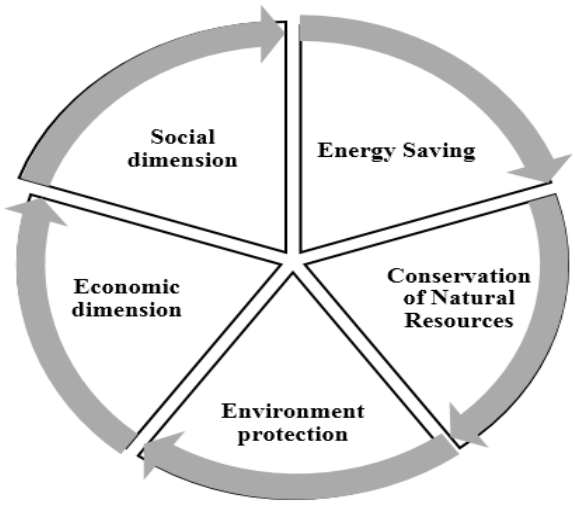

Figure 1: The Strategic Dimensions of Recycling

2.1.5. Limitations of Recycling

There are several difficulties faced by the recycling process in oil companies, which are shown in Figure 2:

Figure 2: Industrial Wastes Recycling Limitations and Barriers

2.2. Green Marketing

2.2.1. Historical development of Green Marketing

Activities involving selling/distribution of products and services is defined as marketing, as per Polonsky [18], who outlined that marketing begins post-production up till actual sales. These marketing concepts are designed to address similar endeavors, but in modern times, it has been adapted into multiple forms to cater to the modern market and customers, examples include integrated marketing, concentrated marketing, direct marketing, casual distributions, focused distribution etc. The myriad of forms of marketing and its corresponding possibilities is a telltale sign that it requires deeper analyses due to the ever-changing landscape of modern businesses. The study and implementation of modern marketing techniques resulted in the emergence of a concept known as green marketing, as perHaytko and Matulich [19]. Green marketing is when the marketing process is focused on the environment or eco-friendliness, utilizing both concepts to produce, distribute, and handle products Bukhari [20].

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2.2.2. Importance of Green Marketing

Green marketing is now one of the mainstays of modern businesses. Due to the creeping increase of global temperature, scientists are encouraging the global populace to reduce their usage/consumption of items that could aggravate this situation. Their effort resulted in increased awareness amongst people, and this subsequently effected their consumption behavior. The current crop of consumers tends to eschew products that harms the environment, which is a trend that is fast catching on.

2.2.3. The Impacts of Green Marketing

The impacts of green marketing on the aforementioned factors are (Figure 3):

Figure 3: The factors of Green Marketing

2.2.4. Green Marketing Activities

- Targeting: Specific customer needs to be targeted in the context of green marketing via green media.
- Green design: The usage of raw materials and its associated activities needs to be more environmentally friendly. Companies can be compelled to prioritize eco-friendly suppliers.
- Green pricing: Companies can reduce costs by adhering to environmentally friendly practices and utilizing green materials. This can be further augmented by setting a pricing policy that reflects their new practices (green pricing).
- Green Logistics: Utilizing environmentally friendly materials in logistics such as paper bags instead of plastic bags. An excellent example would be reusable bags, which can be used multiple times.
- Marketing waste: Obsolete products needs to be consigned to recycling in order to prevent them from becoming waste products. Technology waste is fast becoming a problem due to its rapid accumulation, which makes ecological recycling even more imperative.
- Green promotion: Engaging the public to explain the company's green policy(ies). This would help create awareness vis-à-vis the company and its products.
- Green alliances: Companies that are on the same page with regards to green policies can choose to work together in a setup called a green alliance.

III. The Research Methodology

This section details the research problems/questions, the importance of this study, and the research objectives. The hypotheses, study limitations, and statistical tools used in data analyses will be discussed as well.

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3.1. Research Problem

The importance of recycling and the strategy of cleaner production requires increased support from the leadership/management in petroleum industries (See Figure 4).This could help address environmental threats and promote green marketing, especially when it comes to certain aspects such as pollution and over-exploitation of natural resources. The aforementioned activities produce large amounts of wastes, which endangers the environment.

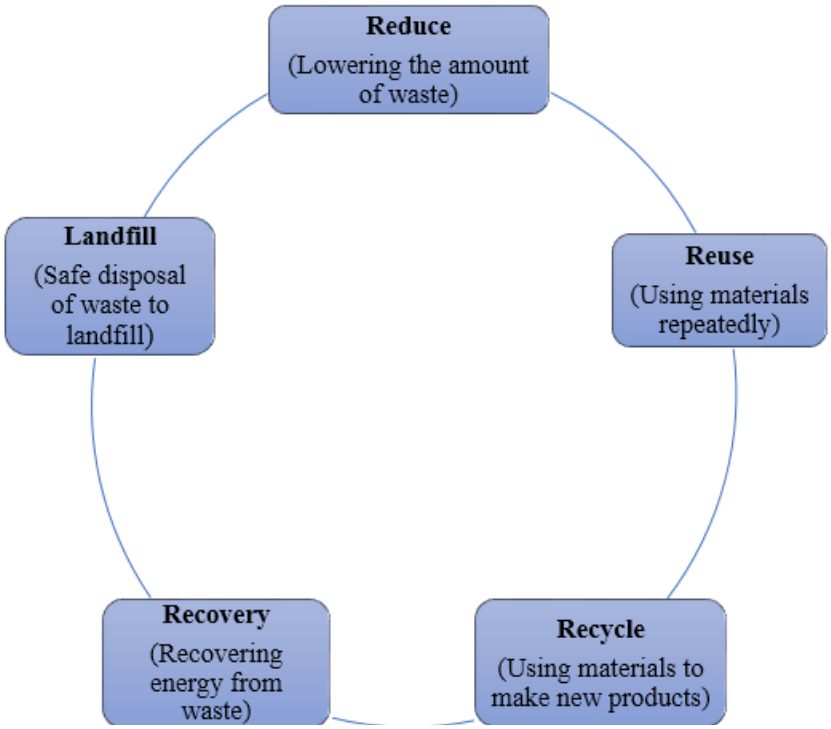

Figure 4: Waste Management Diagram

3.2. The Importance of Research

Recently, petroleum companies used green marketing as a philosophical approach to recycling of industrial wastes. The importance of recycling for the company may result in excellent benefits such as leadership in the market, the preservation of the environment, the rationalization of the use of natural resources, and the mitigation of the depletion of raw natural resources. Most international companies in the oil sector, especially in Iraq (OiLSERV), are setting up special programs for the development of its teams to adopt the most suitable scientific programs in the oil fields.

3.3. Research Hypotheses

1. There is a statistically significant correlation between recycling and green marketing philosophy.
2. The Existence of Effect moral for the variable recycling in the development ability of green marketing.

3.4. Data Collection Tools and Statistical Methods

The data were collected from two sources, the first was from literature and research data supplied by OiLSERV, Iraq (Basra and Maysan branches), while the second was from a questionnaire randomly sent to 31 respondents made up of technicians/engineers working in Chinese Oil.

IV. Results and Discussions

This section discusses the arithmetic average, standard deviation, and coefficient of variation of recycling industrial wastes and green marketing philosophy. Figure 5 shows the distribution of the questionnaire's variables and categories. The respondents were made up of 31 males (100%), with 51 and above years old representing 42% of the respondents. Bachelor degree holders accounted for (45%) of the respondents, while those with (6-10) years of experience accounted for ~32% of the respondents.

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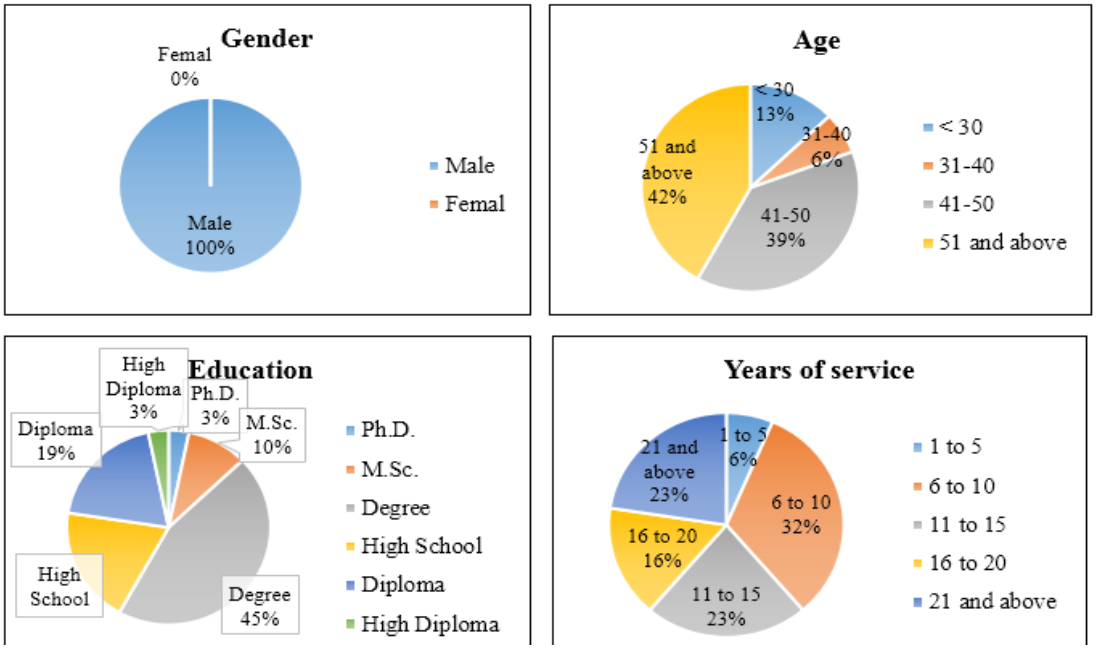

Figure 5: Descriptive Statistics: Demographic Measures (Weighted Percentages)

As per Table 1, the arithmetic average and standard deviation of (X2) decrease in energy consumption costs for reducing environmental pollution were 4.5 and 0.76, respectively, while the arithmetic average and standard deviation of (X5) representing the actual need for the population to decrease depletion of natural resources were 4.21 and 0.65, respectively. The highest response rate of "agree" was reported by X5 (53.1%), while the lowest response rate of "agree" was reported by X2 (18.8%). The highest response percentage of "neutral" was reported by X6 (18.8%), representing the fact that companies reduce oil consumption at an arithmetic average of (4.28) and standard deviation of (0.77).However, the lowest response percentage of "neutral" was reported by X12 and X13 (6.3%), representing the importance of recycling at an arithmetic average of (4.43 and 4.53) and standard deviations of (0.61 and 0.61). The highest response percentage of "disagree" was reported by X11 (12.5%), representing the fact that recycling provides an opportunity for the employment of unskilled labor, atan arithmetic average of (4.15) and a standard deviation of (1.5). The maximum response percentage of "strongly disagree" was reported by X8 (6.3%), representing land filling of hazardous materials, at an arithmetic average of (4.12) and a standard deviation of (1.12).

Table 1: Frequency Distribution, Arithmetic Average and Standard Deviation of Waste Recycling

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree			
Question	Repetition	Percentage	Repetition	Percentage	Repetition	Percentage	Repetition	Percentage	Repetition	Percentage	Arithmetical mean	Standard Deviation
X1	19	59.4	7	21.9	4	12.5	1	3.1	1	3.1	4.31	1.029
X2	21	65.6	6	18.8	5	15.6	0	0	0	0	4.50	0.76
X3	17	53.1	10	31.3	4	12.5	1	3.1	0	0	4.31	0.93
X4	15	46.9	11	34.4	5	15.6	1	3.1	0	0	4.06	1.18
X5	11	34.4	17	53.1	4	12.5	0	0	0	0	4.21	0.65
X6	15	46.9	11	34.4	6	18.8	0	0	0	0	4.28	0.77
X7	19	59.4	13	40.6	0	0	0	0	0	0	4.59	0.49
X8	15	46.9	11	34.4	3	9.4	1	3.1	2	6.3	4.12	1.12
X9	16	50.0	9	28.1	5	15.6	1	3.1	1	3.1	4.18	1.02
X10	13	40.6	12	37.5	5	15.6	1	3.1	1	3.1	4.09	0.99
X11	16	50.0	9	28.1	3	9.4	4	12.5	0	0	4.15	1.05
X12	16	50.0	14	43.8	2	6.3	0	0	0	0	4.43	0.61
X13	19	59.4	11	34.4	2	6.3	0	0	0	0	4.53	0.62

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As per Table 2, the highest response percentage of "strongly agree" was reported by X24 (65.6%),representing the statement "the green marketing is related to environmental awareness", at an arithmetic average of (4.62) and a standard deviation of (0.55), while the lowest response percentage of "strongly agree" was reported by X22 (21.9%), representing the statement "impact of green marketing on the demand", with an arithmetic average of (3.96) and a standard deviation of (0.69).

The highest response percentage of "agree" was reported by X15 (56.3%), representing the statement "the environmental standards related to hazardous wastes", at an arithmetic average of (4.34) and a standard deviation of (0.65), while the lowest response percentage of "agree" was reported by X20 (21.9%), representing the statement "the product quality", at an arithmetic average of (4.09) and a standard deviation of (1.2). The highest response percentage of "neutral" was reported by X22 (25%), representing the statement "impact of green marketing on the demand", at an arithmetic average of (3.96) and a standard deviation of (0.69), while the highest response percentage of "disagree" was reported by X27 (25%),represented the statement "green marketing philosophy", with an arithmetic average of (3.78) and a standard deviation of (1.06).

Finally, the highest response percentage of "strongly disagree" was reported by X20 (6.3%),representing the statement "product quality", at an arithmetic average of (4.09) and a standard deviation of (1.20).

Table 2: Frequency Distribution, Arithmetic Average and Standard Deviation of Green Marketing

Question	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree		Arithmetical mean	Standard Deviation
	Repetition	Percentage	Repetition	Percentage	Repetition	Percentage	Repetition	Percentage	Repetition	Percentage		
X14	12	37.5	16	50.0	3	9.4	1	3.1	0	0	4.21	0.75
X15	13	40.6	18	56.3	1	3.1	0	0	0	0	4.34	0.653
X16	19	59.4	12	37.5	1	3.1	0	0	0	0	4.56	0.564
X17	10	31.3	16	50.0	5	15.6	1	3.1	0	0	4.09	0.777
X18	20	62.5	9	28.1	2	6.3	1	3.1	0	0	4.50	0.762
X19	16	50.0	9	28.1	7	21.9	0	0	0	0	4.28	0.812
X20	17	53.1	6	18.8	6	18.8	1	3.1	2	6.3	4.09	1.201
X21	11	34.4	14	43.8	6	18.8	1	3.1	0	0	4.09	0.817
X22	7	21.9	17	53.1	8	25.0	0	0	0	0	3.96	0.694
X23	10	31.3	13	40.6	5	15.6	4	12.5	0	0	3.90	0.995
X24	21	65.6	10	31.3	1	3.1	0	0	0	0	4.62	0.553
X25	18	56.3	13	40.6	1	3.1	0	0	0	0	4.46	0.802
X26	16	50.0	12	37.5	2	6.3	2	6.3	0	0	4.25	1.047
X27	10	31.3	10	31.3	7	21.9	5	15.6	0	0	3.78	1.069

The correlation between the independent variable (recycling) and dependent variable (green marketing) is tabulated in Table 3, showing a strong positive correlation between waste recycling and green marketing, with a correlation coefficient of ~0.8.

Table 3: Correlation between Wastes Recycling and Green Marketing

Independent variable / Dependent variable	Waste recycling
Green marketing	0.8

Table 4shows the impact of waste recycling on green marketing. The value of calculated (F) exceeded that of the tabular value of (F), at a significance level of 0.05. The correlation coefficient was ~0.644, referring to the impact of the independent variable on the dependent variable. The value of calculated (T) exceeded that of the tabular value of (T), with a significance level of 0.05.

Table 4: The impact of Wastes Recycling on the Green Marketing

R2	T		F	
	Tabular	Calculated	Tabular	Calculated
0.644	1.684	7.369	2.114	54.299

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V. Conclusions

This research focused on the relationship between industrial waste recycling and green marketing. The significant impact of green marketing philosophy on the Iraqi petroleum industry was theoretically and analytically analyzed. The following conclusions were made:

1. The significant impact of the recycling process and the concept of green marketing led to increased interest in the environment by oil companies.
2. The implementation of industrial wastes and residues via the application of the concept of green marketing is an index in the company's environmental management approach.
3. The Iraqi oil industry suffered from serious environmental degradation due to lower consumer awareness and its role in civil society.
4. Iraqi consumers do not consult environment standards when selecting products.
5. The managerial and technical staffs are unable to mitigate serious environmental degradation.

References

[1] J. S. Alshammari, F. K. Gad, A. A. M. Elgibaly, and A. R. Khan, "Solid waste management in petroleum refineries," Am. J. Environ. Sci., 2008.
[2] L. J. Da Silva, F. C. Alves, and F. P. De França, "A review of the technological solutions for the treatment of oily sludges from petroleum refineries," Waste Management and Research. 2012.
[3] S. Jafarinejad, "Solid-Waste Management in the Petroleum Industry," in Petroleum Waste Treatment and Pollution Control, 2017.
[4] A. Pires, G. Martinho, and N. Bin Chang, "Solid waste management in European countries: A review of systems analysis techniques," Journal of Environmental Management. 2011.
[5] D. Hoornweg and P. Bhada-Tata, "A global review of solid waste management," 2012.
[6] S. Anderberg and E. Clark, "Green and sustainable Øresund region: Eco-branding Copenhagen and Malmö," 2013.
[7] G. John, "The Green Marketing Manifesto." Willey pub.: USA, 2007.
[8] S. Srikanth, M. Kumar, and S. K. Puri, "Bio-electrochemical system (BES) as an innovative approach for sustainable waste management in petroleum industry," Bioresource Technology. 2018.
[9] X. S. Qin, G. H. Huang, and L. He, "Simulation and optimization technologies for petroleum waste management and remediation process control," Journal of Environmental Management. 2009.
[10] W. E. Baker and J. M. Sinkula, "Environmental marketing strategy and firm performance: Effects on new product performance and market share," J. Acad. Mark. Sci., 2005.
[11] G. Nyilasy, H. Gangadharbatla, and A. Paladino, "Perceived Greenwashing: The Interactive Effects of Green Advertising and Corporate Environmental Performance on Consumer Reactions," J. Bus. Ethics, 2013.
[12] R. Mead, R. N. Curnow, and A. M. Hasted, Statistical methods in agriculture and experimental biology: Third edition. 2017.
[13] R. Hahnel, Green Economics: Confronting the Ecological Crisis: Confronting the Ecological Crisis. Routledge, 2014.
[14] C. D'Souza and M. Taghian, "Green advertising effects on attitude and choice of advertising themes," Asia Pacific J. Mark. Logist., 2005.
[15] C. N. Leonidou and L. C. Leonidou, "Research into environmental marketing/management: A bibliographic analysis," Eur. J. Mark., 2011.
[16] J. Lienig and H. Bruemmer, "Recycling Requirements and Design for Environmental Compliance," in Fundamentals of Electronic Systems Design, Springer, 2017, pp. 193–218.
[17] M. Geissdoerfer, P. Savaget, N. M. P. Bocken, and E. J. Hultink, "The Circular Economy–A new sustainability paradigm?" J. Clean. Prod., vol. 143, pp. 757–768, 2017.
[18] M. Jay Polonsky, "An introduction to green marketing," Glob. Environ. Probl. Policies, vol. 2, no. 1, 2008.
[19] D. L. Haytko and E. Matulich, "Green advertising and environmentally responsible consumer behaviors: Linkages examined," J. Manag. Mark. Res., 2008.
[20] S. S. Bukhari, "Green Marketing and its impact on consumer behavior," Int. J. Innov. Technol. Adapt. Manag., 2014.

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