

**The Aftermath of BP Gulf Spill:
Reforming a Deficient Safety Culture and Regulatory System
Through Consumer Pressure**

Rebecca Ward

Sanford School of Public Policy

Duke University

Durham, NC

Professor James Hamilton

Professor Judith Kelley

Public Policy Honors Thesis

December 9th, 2011

Table of Contents

Abstract

I. <u>Introduction</u>	2
II. <u>The Oil Industry: Current Standards of Regulation and Safety</u>	
a. Areas of Regulation, Past Incidents and Voluntary Improvement.....	4
b. Academic Perspectives on the Regulatory Atmosphere.....	7
c. Safety Culture: An Industry of Misaligned Incentives.....	8
d. Oil Industry’s Greenwashing: Public Relation Campaigns for Environmentalism...10	
III. <u>Evaluating Government’s Reform Recommendations</u>	
a. BP Oil Spill Commission’s Recommendations.....	12
b. Political infeasibility.....	14
IV. <u>Information Provision and Environmental Ratings</u>	
a. Aligning Safety Culture with the Industry’s Best Interest.....	15
B. Information Provision: Consumer Pressure to Increase Safety.....	17
C. Public Demand for Environmental Responsibility and Information.....	18
V. <u>Implementation</u>	
A. Developing an Information Provision Program.....	20
B. Life Cycle Analysis.....	22
C. Potential Limitations: Industry Responsiveness, Consumer Willingness and Political Feasibility.....	25
VI. <u>Conclusion</u>	27
<u>References</u>	30
<u>Appendix 1</u>	35

Abstract

In 2010, the BP spill in the Gulf of Mexico cast doubt on the efficacy of oil regulation and the future of offshore drilling. In this paper, I examine the causes and ramifications of the BP spill in the context of oil regulation and industry safety culture. I argue that the spill resulted from a deficient safety culture, poor regulatory oversight, and negligible prioritization of the environmental and safety protocol. To correct the incentive schemes and safety culture of the oil industry, I propose a model that utilizes consumer pressure to incentivize companies to maximize environmentally responsible production. Ultimately, disclosing the environmental records of oil companies can capture environmentally minded consumers and align the best interests of the industry with environmental stewardship.

I. Introduction

On April 20th, 2010, the Deepwater Horizon Drilling rig exploded in the Gulf of Mexico, claiming the lives of 11 workers. BP was able to contain the oil spill only after it released an estimated 4.9 million barrels of crude oil into the Gulf of Mexico over a three-month span. The BP Gulf spill remains the largest environmental accident in U.S. history and it will be years before the true effects can be estimated and decades yet for the Gulf to approach normalcy.ⁱ This disaster, however, was neither unforeseen nor inevitable. An analysis of the BP spill and previous accidents reveals a fundamental flaw within the oil industry's safety culture. A company's safety culture is derived from "the product of individual and group values, attitudes, perceptions, competencies and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management."ⁱⁱ Past oil regulation and monitoring have not fostered the necessary incentives for firms to internalize the costs of safety or environmental stewardship. The unbalanced incentive scheme has led to a safety culture that prioritizes expediency over regulation and continually puts its workers and the environment at risk.

In the wake of the BP spill, President Obama created the BP Oil Spill Commission to examine the cause of the spill and recommend future actions. The commission's report suggested future changes to oil regulations and the oil industry's operating culture, but any pertinent changes will falter without adequate funding or legislative support. The oil industry's reiterated accident history and ability to influence policy indicates that a solution based on enhanced regulation is neither plausible nor viable. To prevent the occurrence of the next BP spill, this analysis considers an alternative model to regulation, which bypasses the costs and political obstacles of enhanced regulation, and specifically targets the deficient safety culture of the oil industry.

This analysis will begin with exploring past incidents of oil spills and the reoccurring flaws within the regulatory system and industry safety culture. The analysis will then examine the requisite changes needed to incentivize companies to abide current regulation and appropriately value environmental protection. The identified changes will be contrasted to those proposed by the BP Spill Commission. Because the Commission's recommendations hinge on an increased budget and favorable legislation, an alternative model will utilize consumer demand for environmentally responsible products to alter oil companies' incentive structure and safety culture.

The groundwork for the alternative model includes an information provision disclosure on gasoline and diesel products that is measured in a numeric ranking system based on a life cycle analysis of the environmental effects of oil production. The information provision program would allow consumers to reward oil companies' commitment to environmental responsibility through market pressures, and thus

incentivize more corporate responsibility, leading to an improved safety culture and cleaner environment.

II. Oil Industry: Current Standards of Regulation and Safety

A. Areas of Regulation, Past Incidents and Voluntary Improvement

Though the BP oil spill occurred as a result of a blown well in a deepwater offshore drilling operation, the blowout and subsequent environmental damage were not simply the result of a technical malfunction. For instance, BP's response plan for oil retrieval, clean up and containment did not include contingent plans should the blowout preventer fail. Without solidified responses or technology to contain the spill, an effective way to stop the oil leak perplexed the industry and nation for three months. While the regulation of adequate deep-water technology and response plans are essential, it is a symptomatic cure for an industry wide problem. The reiteratively poor safety record is not isolated in offshore drilling; many sectors of oil production are marred with spills and accidents. Specific examples include the Exxon Valdez spill in 1989, the Texas oil refinery explosion in 2005, and the burst pipeline in Prudhoe Bay, Alaska in 2006.

Exxon Valdez released 11 million gallons of oil into William Prince Sound after the tanker ran collided with a reef.ⁱⁱⁱ The accident stemmed from an overworked crew, a common complaint for Exxon's shipping personnel, and a radar system that had been broken for over a year.^{iv} The effort to reclaim oil out of the sound was extremely unsuccessful, and the National Oceanic and Atmospheric Administration (NOAA) reports that cleanup crews recovered only 14% of the oil.^v After the spill, Congress passed the

Oil Pollution Act of 1990 that mandated oil spill prevention and preparedness requirements. The 1990 act stipulates that oil companies prepare ‘Oil Response Plans’ for oil extraction and transportation.^{vi} The BP Oil Spill Commission reports that BP only superficially followed this legislation, but their Gulf response plan “lacked serious attention to detail” (pg. 100). The response plan recommended the consultation of an expert who was deceased years before the BP spill and listed concern for biological resources nonexistent in the Gulf—including sea lions, sea otters, and walrus.^{vii} Despite these glaring flaws, the Mineral Management Service (MMS) approved the report without additional analysis.^{viii} Exxon Valdez demonstrates that an accident does not stipulate self-guided improvement from the oil industry nor does the current legislation offer enough disincentives to offset the profitability of cost-cutting decisions.

The Prudhoe Bay oil line is another example of BP’s emphasis on expedited production over safety and maintenance. The pipeline leak went undetected for as long as five days in Alaska and government reports state the pipes were poorly maintained and inspected. Additionally, the poor inspection and maintenance persisted after an internal BP investigation warned of pipeline corrosion. As a result of the leak BP paid more than \$20 million in fines and restitution.^{ix}

The Texas Oil refinery explosion occurred in March 2005, when workers overfilled a 170-foot tower with liquid hydrocarbons. Chemicals began escaping the overfilled tower and caused an explosion that killed 15 workers and injured 170 more. The Chemical Safety Board found that the explosion was "caused by organizational and safety deficiencies at all levels of BP."^x

BP is not an exception within the oil industry’s safety record; U.S. Minerals

Management Service has investigated 18 blowouts and 13 losses of well control in the U.S. Gulf of Mexico since 1983, with three such incidents occurring since 2007.^{xi} While these accidents average to approximately one blowout per year, the impact of these spills in both economic and environmental costs for local communities is far too high for one accident a year to be an acceptable risk level. In terms of effects on individuals, local industries and the U.S. economy, the EPA estimates the costs of clean up at \$218 per gallon. The report concludes that these costs are avoidable should industry “identify motivation for implementing spill prevention measures.”^{xii} While it is impossible to prevent all accidents, oil companies can prevent major disasters through adequately valuing safety pre-cautions and planning for worst-case scenarios. However, given these incidents and lack of progress with safety development and prevention, a successful reform is unlikely if it remains profitable and acceptable for safety to be sacrificed in lieu of profit.

The dysfunctional blowout preventer, failed cement casing and dismal oil recovery planning are the technical aspects that led to the rig’s blowout and resulting nearly 5 million barrels of oil in the Gulf of Mexico. The technological problems are underlined by the inefficient oil regulatory system and incentive structure of oil extraction. Simply correcting the technical aspects will not address the industry’s safety culture, which will continue to mar oil production, local economies and environments. Without addressing the underlying causes of the Gulf spill, companies will continue to neglect safety and the effects on the environment, dependent economies, and taxpayers in order to minimize costs to the industry.

B. Academic Perspectives on the Regulatory Atmosphere

Endeavored reforms to the oil industry have a frustrating history within the regulatory agencies and legislation. In July 1991, MMS published a notice requesting comments on alternative strategies to promote safety and environmental protection within the industry. Despite these suggestions, up to 20 years later when Deepwater Horizon exploded, the MMS had not been able to pass a rule mandating that all operators have plans to manage safety and environmental risks (BP Oil report, pg 69-71). The report also notes that the reform was not just a failure from MMS, but that “the industry served as an initial impediment to MMS reform efforts” (Pg 71). The internal structure of MMS lead to conflicting interests; they were responsible for the both the issuance of leases for wells and collecting royalties on the wells’ production. This pitted their responsibility for evaluating safety and environmental concerns with a financial incentive for greater oil production. Flournoy et al (2010) argue that the MMS was “captured” by the oil industry, and came to see industry, rather than the public, as its constituency. That conflict of interest created regulators who were particularly susceptible to demands from the industry, and “led to an appalling lack of energy in its efforts to protect against industry excesses” (pg 5). Industry excesses could include flimsy safety standards, minimal investment in clean up equipment, and a basic ignorance of the ecosystems and environments that they were risking. Widener (2011) laments the appointment of industry “experts” in a realm that is a “conundrum of mixing science and ethics” (pg 4). Widener argues that the BP blow out perhaps “serves as a useful, if painful, illustration of the need for consensus regulation through public inputs and caucus bargaining” (pg 6). Ultimately, because the MMS was unable to enforce existing regulation, BP was allowed

to operate in a purely self-regulatory model where the costs of environmental protection were internalized. A self-regulatory system operates under the assumption that the company's best interest is to comply with regulation because the risks of being caught or the effects of non-compliance are too high. For the oil industry, the costs of non-compliance have been historically negligible compared to the overall profits gained from regulatory disregard. The next section examines if the BP Spill Commission's suggestions have the ability impose an effective cost on industry for non-compliance.

C. Safety Culture: An Industry of Misaligned Incentives

According to the BP Oil Spill Commission, the oil industry must rededicate itself to improving its safety culture and the government must provide more effective regulatory oversight.^{xiii} A successful reform of the safety culture must go beyond the worker's level and permeate the hierarchy of values, beliefs and actions held throughout the company. The Advisory Committee on the Safety of Nuclear Installations (ACSNI) describes safety culture as: "the product of individual and group values, attitudes, perceptions, competencies and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management."^{xiv} With this definition, a safety culture is more than the stated regulations, but an ever adapting and susceptible confluence of the ideals, beliefs, practices and priorities of a company. For the oil industry, an effective safety culture entails the commitment of managers and senior officers conveying a sense of safety prioritization for their workers.

This message must not only be disseminated through the company and reinforced through practices, but workers must feel comfortable and confident enough to report safety malfeasances. BP failed to encourage workers to practice operational safety, and

instead used punitive measures when safety concerns were vocalized. In 2006, less than 6 months after the Prudhoe Bay line burst, a technician, Stuart Sneed, stopped work on an Alaskan site because he feared sparks would ignite a recently discovered cracked pipeline. Sneed was not praised for his prudence, but rather reprimanded in a staff meeting and fired two weeks later.^{xv} Unfortunately, BP's safety culture had not adapted in the years between Prudhoe Bay and the Gulf Spill.

The BP Spill Commission's final report depicts BP's safety culture as "an industrial environment of inappropriate cost and corner cutting" (pg 10), which allows, or even encourages, safety to be sacrificed for economic profit.^{xvi} BP's actions have demonstrated that instilling an effective safety culture is not a priority. After BP's oil refinery explosion in Texas, 2005, the US Chemical Safety and Hazard Investigation Board found that "significant process safety issues exist at all five U.S. refineries, not just Texas City." As a company, BP had not created "a common unifying process safety culture among its U.S. refineries." The report found "instances of a lack of operating discipline, toleration of serious deviations from safe operating practices, and [that an] apparent complacency toward serious process safety risk existed at each refinery."^{xvii} Five years later, the reports from the Gulf Spill do not reveal progress in correcting, as one regulator stated, the "terrifying safety culture of BP."^{xviii}

When regulation is insufficient to change the offending safety culture or is simply disregarded, policy must address the underlying structure and supply the appropriate incentives for the culture to evolve. In this case, the culture is derived from the economic value of quick, cheap work. Other large industries have faced similar motivation to skirt regulation for profit, but have managed to transform their corporate culture. Gunningham

(2005) explains that large chemical manufacturers are responsive to regulation not because of the trepidation of fines or sanctions, but because failure to comply would send “very undesirable signals to important stakeholders, triggering a variety of informal sanctions.” Another example is the nuclear energy industry. After two meltdowns at 3 Mile Island and Chernobyl in the 1980s and early 1990s, Carter (2006) explains the public viewed the nuclear power as a “dying industry owing mainly to concerns about the safety of the nuclear units.” Since public support for the industry was eroding, there was an aggressive industry movement to improve plant operation and maintenance. Once the industry revitalized its safety records and enhanced precautions, the public eventually began to view the nuclear energy operations as a reliable electrical power source.

Both the chemical and nuclear industry sought internal measures to increase safety through employee training and safety prioritization: they sought “safe information and procedures for the operators” in addition to merely ‘safe’ technology.^{xix} This change in procedure allowed the chemical and nuclear industries to continue production while improving their safety cultures. Until this point, the oil industry has managed to reap substantial and growing profits without being forced to undergo such internal changes in safety, despite poor environmental performance. Oil companies must experience an equitable scrutiny from stakeholders, consumers, markets or regulators to offset the economic incentive to neglect safety standards.

D. Oil Industry’s Greenwashing: Public Relation Campaigns for Environmentalism

The oil companies are well aware of the growing demand for environmental responsibility and have taken time and expense promoting themselves as environmentally friendly. BP transformed its name and image from “British Petroleum” to “Beyond

Petroleum.”^{xx} Despite the poor track record on environmental accidents, BP made several public relation campaigns espousing their environmental stewardship. Cherry (2010) explains that BP “expended significant effort and resources successfully branding itself as a kinder, gentler, and greener oil company, committed to taking the world “Beyond Petroleum” to cleaner, renewable alternative energy sources” at the same time they “flouted workplace regulations designed to protect employee safety, ignored environmental laws for oil and profit” (Pg 1014). Their website further underscores their desire to be seen as environmental leaders, stating, “In response to increasing demand for energy with a lower-carbon footprint, we have made a major commitment to develop low-carbon sources of energy.”^{xxi} Their campaign was quite effective; a Landor Associates survey found that 21% of consumers thought BP was the greenest of oil companies, followed by Shell at 15% and Chevron at 13%.^{xxii} Chevron also claims commitment to sustainable energy and America’s energy needs, its website stating “through continued investments in energy supplies and ever cleaner technologies that help secure America’s economic future.”^{xxiii} Exxon Mobil’s CEO also lauds the challenges of energy, and in an address early in 2011, said “[t]o sustain progress, we must continue to safely expand the world’s energy supplies, improve the ways in which we consume energy sources, and address attendant environmental challenges.”^{xxiv}

These ad campaigns mask the low priority the industry’s culture allots to protecting the environment. According to a 2007 Senate document, BP, Chevron, and Exxon’s spoken commitment to sound environmental policies or alternative fuel is far greater than their financial initiatives or support.^{xxv} A media-tracking group called TNS Media Intelligence found that the oil industry spent \$52.5 million on campaigns that

portray their product as environmentally friendly (greenwashing) in the first quarter of 2008 to publicize \$58.4 billion investments renewable energy from 2000-2008. However, the disaggregation of that investment shows that the industry only spent \$6.7 billion on “non-hydrocarbon technology” including ethanol, wind, and solar.^{xxvi} \$21.1 billion went to liquefied natural gas, and the rest of the investment went to energy efficiency. Overall, the ‘large investments’ in renewable and alternative energy from ventures averaged a mere of 4% of total 2008 big five oil company profits.^{xxvii} In addition to misleading promises of renewable energy, the report further states that the oil industry “modestly invested in...vehicle fuel efficiency technologies,” and oil companies used “their market power to discourage service stations from stocking or offering E85 fuel and to create rules that make it difficult for consumers to compare prices for, fill up with, or purchase ethanol (E85).”

III. Evaluating the Government’s Model for Reform

A. BP Oil Spill Commission’s Recommendations

The BP Spill Commission’s report divides recommendations into seven sections: *Improving the Safety of Offshore drilling, Safeguarding the Environment, Strengthening Oil Spill response, Advancing Well Containment Capabilities, Restoring the Gulf, Ensuring Financial Responsibility, and Promoting Congressional Engagement.* The sections enumerate recommendations including increased audits, increasing the liability cap, increasing research and development to improve spill response, and restructuring MMS to the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE). While enunciating the need for the oil industry to increase self-policing and

transform their safety culture, the report does not illustrate how this reform would occur or why the BP spill should transcend prior accidents and act as catalyst for industry change.

For safety reform, the commission's model draws from other industries that utilize self-policing organizations. The commission recommended the chemical, nuclear power and civil aviation industries as models to help formulate practical self-regulation because they operate with similar technical complexity as the oil industry. The commission highlights the practicality of self-policing since a relatively limited number of people possess the requisite expertise and experience to regulate complex technological processes. They endorse the self-regulation even as they acknowledge "industry self-policing is not a substitute for government but serves as an important supplement to government oversight" (pg 234). Self-regulation and risk management only become germane when the risk of being caught outweighs the gains of violating regulation. In the case of Deepwater Horizon, the cost of operating the rig approached \$1 million per day. The maximum civil penalty allow per day was (and remains) \$40,000.^{xxviii} As long as the companies can compensate for fines through lower operating costs, they have an incentive to operate under sub-par safety conditions. The disparity between penalties for non-compliance and operating costs creates a perverse incentive for drillers to complete operations in a timely rather than safe manner.

The ultimate goal of the report is:

to create a new, independent agency responsible for safety and environmental review of offshore drilling; stronger environmental review and enforcement; a reorientation of spill response and containment planning; and a revision of liability rules to better protect victims and provide proper incentives to industry—aim to establish an oversight regime that is sufficiently strong, expert, well-resourced, and flexible to prevent the next disaster, not the last." (Pg. 291)

If implemented, the commission's recommendations could help prevent another environmental hazard, but there have been many suggested changes to oil regulations that have never seen fruition. With caveats like "Congress needs to make funding the [regulatory] agencies a priority in order to ensure a safer and more environmentally responsible industry" (pg 290), the possibility of this report effectively changing the safety culture seems near impossible.

As suggested in the report, BOEMRE was disengaged from royalty collection on operating wells as of October 1st, 2011. Once BOEMRE fully separated from revenue collection, its budget *decreased* by 15 million from 2010-2011.^{xxix} This is compared to BOEMRE Director Bromwick's request for \$100 million budget increase that is needed to "do the job the public deserves."^{xxx} The increasingly anemic regulatory budget underscores that for the BP Commission's recommendations to have validity and positively transform the oil industry, they have to be practically and politically feasible.

B. Political Feasibility

The commission's report states that the American Petroleum Institute (API) "regularly resists agency rulemakings that government regulators believe would make those operations safer, and API favors rulemaking that promotes industry autonomy from government oversight" (pg 225). The BP Commission's report revolves around recommendations for Congress, but with the implicit postulation that suggestions can become legislation. A limiting factor of the commission's suggestions is the "assumption that environmental policy is made by a single decision maker or decision making unit, typically represented by a regulator or a legislator" (Hahn, 1990). Historically, MMS has had negligible success in implementing new policies. Future legislation seems equally

unviable, especially with the high prevalence of staunch industry and interest groups. Already, Republicans in Congress have blocked any enhanced restrictions for offshore drilling and have not acted on proposals to raise the liability cap.^{xxxix} As noted above, the anemic budget of the regulatory agencies is facing cuts rather than fortification.

The political opposition is not novel; there has been a trend of deregulation, subsidizing oil production and stagnant safety measures for almost two decades (see appendix 1).^{xxxix} The government has begun issuing new leases for Gulf exploration without a tangible difference in the regulatory or safety preparations of the oil companies. Given the trends of political opposition, it is highly unlikely that BOEMRE will receive the additional funding advocated in Obama's 2012 budget plan to enable the requisite changes in the safety culture through adequate government regulation.^{xxxix}

IV. Information Provision and Environmental Ratings

A. Aligning Safety Culture with the Industry's Best Interest

The BP Commission's report acknowledges that increased government oversight must be supplemented by the oil and gas industry's internal reinvention of their safety management. It states "sweeping reforms that accomplish no less than a fundamental transformation of its safety culture" are needed before the oil companies can "truly earn the privilege of access to the nation's energy resources located on federal properties" (pg 222). The academic literature suggests aligning safety measures with the best interest of the company is a more effective way of turning safety into a priority instead of a trivial burden. For instance, Barkenbus (1983) discusses the implications of self-regulation within the nuclear industry and concludes that the key to self-regulation is the incentive

structure where conducting the plants in the safest possible is aligned with the best interest of the companies. There is also the economic incentive: Becker (1968) proposes an economic solution where the offender pays not only for the costs directly accrued by the public, but also the cost of monitoring the activity. Without the ability to utilize regulation and fines to deter negligent behavior, there must be a systemic change to how the oil industry views safety and profits as conflicting priorities. A *Resources for the Future* (RFF) report finds two reasons that firms do not choose a socially optimal safety culture. First, firms may produce negative environmental externalities that are not accounted for in their cost metric, and second, “principal-agency” problems within the firm may cause employees and owners to have different incentives for adopting a safety culture. The RFF report concludes that current economic and policy incentives are insufficient for promoting safety culture. Policies must force the costs of spills to be internalized and third party monitoring should reduce principal-agency problems by aligning the profit and safety incentives within the firm.^{xxxiv}

RFF’s reasoning is complimented by Ian Ayres and John Braithwaite’s argument, which centers on a responsive regulation scheme, one that is a compromise of “enforced self-regulation” (pg 39). They argue when enforcement is possible and occasionally implemented it becomes the “benign big gun,” where simply the threat of enforcement is enough to prompt compliance. For the oil industry, this means that they must monitor themselves knowing that there are consequences for non-compliance. Within the current system of oil regulation where the fines are capped at \$75 million and negligible punishment for a derelict safety record, the incentive structure is not aligned with an optimal safety and prevention model. And, according to Hanies (2009) all regulation

cannot be understood as only the enforcement efforts of the regulator, but also the reform process and the structure of the concerned industry. With their suggestions, the BP Commission is assuming a political ability to change regulation and economic penalties, all while expecting a transformation in the internal structure of BP that seems to be unwarranted and perhaps impossible given the history of the company.

Given these recommendations are unlikely to successfully transform the safety culture or create a more responsible industry, it is time to consider a new model. The oil industry would not have an incentive to circumvent environmental and safety regulation if it were not profitable to do so. Regulation would change the safety culture through fining non-compliance, but those fines are not enough to offset the lower production costs and cannot currently be raised by legislation. If it were possible to guide consumer choices to those companies with the best environmental and safety practices, oil companies would be forced to internalize a portion of environmental damage into the cost of production instead of diverting the costs to consumers and the environment. An alternative model would utilize the oil industry's desire to be seen as a progressive, or 'green' industry and the preferences of consumers to support more environmentally responsible firms. The model could utilize government information regarding the oil industry's practices and their compliance with regulation to create an information provision. The information provision would translate the industry's environmental effects into a clear and salient rating to guide consumer purchases.

B. Information Provision: Consumer Pressure to Increase Safety

The concept of information provision as a regulatory aid is that a functioning market does not necessarily produce adequate information for consumers to make

informed decisions among goods and services. Fung et al (2007) explain that when there are hidden risks or large externalities that affect the public at large, the government can reduce those risks through the required disclosure of the missing information.^{xxxv} These transparency policies require “mandated public disclosure by corporations or other private or public organization of standardized, comparable and disaggregated information regarding specific products or practice to further a defined public purpose” (Fung pg. 6). In the case of the oil industry, the hazards and externalities come in the form of environmental and economical damage caused by oil spills, pipeline leaks and bursts, and excessive pollution from the extraction, refining and transportation of oil.

Mandating information provision discourage on oil companies and on gasoline products creates a clear and objective standard of oil companies’ environmental records. The transparency those records puts pressure on the company to increase their safety and environmental protection, thus allowing consumers’ preferences to change the economic incentives that cause a deficient safety culture.

C. Public Demand for Environmental Responsibility and Information

Consumers are increasingly in the market for products that are environmentally responsible. Bjorner (2004) finds that the “Nordic Swan,” a symbol to signify products made by environmentally responsible methods, had increased consumers’ willingness to pay for certain products as much 13% to 18% of the price. Specifically in the realm of gasoline, Singh et al (2011) find “a clear purchase pattern that favors gasoline brands perceived to be the most environmentally friendly, in fact, to a degree that consumers are willing to drive far to locate their favorite gasoline stations.” Singh’s U.K. based study tested three brands of gas that were perceived as environmentally friendly, neutral, or

with a poor environmental record. She found that there was a strong positive correlation between ‘green orientation’ and the most environmentally friendly brand and that the positive environmental rating would persuade respondents to seek out the company. Singh also notes that regulation is not the driving force behind social responsibility, but rather the reinforcement of consumer convictions and a minimum level of acceptable action, indicating consumer pressure may be more effective than government intervention.

As the general public pays more attention to companies' environmental performance, it becomes increasingly important to supply pertinent information to stakeholders and consumers to have complete information within the markets (Klassen, 1996). However, it is not enough to simply compile this information in an obscure database or government report. There are numerous groups already in place to rank oil companies' environmental responsibility: World Environment Center, Business for Social Responsibility, Responsible Shopper, Greenopedia, Green Cross International, Sierra Club, Earth's Friends, the Covalence Ethical Quotation System, etc. From these rankings, BetterWorld Shopper compiled a grade for gas stations but the results are hard to interpret, full of unexplained acronyms, and inaccessible when consumers are making decisions about where to buy gas. Consumers care that a firm is environmentally responsible, but responsibility and sustainability are difficult terms to quantify and rank within the complex production chain of the oil industry.

A Toronto-based socially responsible investing (SRI) research firm called Jantzi Research released a report in 2006 entitled “Oil and Gas in a Bull Market: The Shifting Sands of Responsibility” that rated 23 oil and gas companies on their social and

environmental performance. Jantzi's report addresses the complexity of the environmental component by subcategorizing different environmental issues. For example, under the "impact and initiatives" subcategory, the report examines greenhouse gas emissions, and specifies the company's emissions record and management systems. Even with a compartmentalized rating system, there are many factors that will affect whether or not an environmental ranking system will help consumers make informed environmental decisions and hence affect the oil industry through consumer pressure for environmental stewardship.

V. Implementation

A. Developing an Information Provision Program

As regulation remains stagnant in Congress and budget constraints plague the government, there is an increasing need to find a cost-effective solution to environmental problems. An information provision program could instill a co-operative approach between industry and public authorities while allowing both parties to avoid the negative legal and political consequences associated with regulatory failure. This economical and environmental necessity has led to a shift in the regulatory paradigm towards encouraging self-monitoring actions by firms to supplement existing regulations in the U.S and in Europe.^{xxxvi}

This shifting paradigm comes in the form of publicly providing environmental information regarding firms and products to "encourage citizens to make informed choices, and to signal their preferences for environmentally friendly firms" (Kahanna, 2001). This is not a novel concept within the U.S. or Europe with the EPA establishing

over 31 mandatory programs and the European Union providing around 310 voluntary agreements that report the environmental effects from different industry sectors (Carraro and Leveque, 1999). An information provision program would be targeted to U.S. consumers and include environmental information on oil from both domestic and international sources. While ideally there would be a global consensus to support environmentally responsible firms, that would require political expertise and analysis of international oil infrastructure that goes beyond this analysis. Conveying U.S. consumer support however, must first be addressed through the proper implementation of an information provision program.

Two major factors affect the success of information provision. First, targeted transparency must be user-centered. Transparency policies must create information that is pertinent to the user, that is comprehensible, and that can be easily embedded in the routines of the consumer--- meaning the consumer changes or adapts their behavior based on the information provided.^{xxxvii} If there is adequate information gathered, but it is not formally compiled or accessible during the time of purchase or consumption, the knowledge is not effective in changing the behaviors of the firm. For example, the EPA supplies a list of firms potentially responsible for hazardous waste sites, the historical profile of inspections, enforcement actions and penalties assessed on all regulated facilities to the public. Internationally, the environmental agency in British Columbia publishes a list of firms in violation of environmental regulations or that have poor environmental performance, but those lists are not readily available or applicable to public behavior.

Second, policies must become sustainable. A sustainable information provision

must expand the scope of information over time, increase the accuracy and quality of information, and increase the use of information by consumers, investors and public entities.^{xxxviii} With the marked expansion of technology, production and potential for environmental spills in increasingly delicate ecosystems, any regulation must adapt to new methods in the industry, and improve the depth and quality of information to the consumers of oil.

B. Life Cycle Analysis

Life cycle analysis (LCA) is a process to assess the environmental impact of a product throughout all stages of the product's life.^{xxxix} The disclosure of an oil life-cycle analysis could hold the industry accountable for the environmental affects of oil extraction, refining and transportation. Not only would the life-cycle analysis lead to competition for the least environmentally damaging oil and gas, the information provision could also include disclosure on investment in renewable resources, clean up and prevention technology, and responsiveness to regulation and mandates from regulators. Elcock (2007) explains that numerous companies already track the environmental responsibility of firms, and Life Cycle Inventory (LCI) data is available from numerous sources in the U.S. (various universities and research organizations, and by various government departments, consultants and industry organizations). In 2001, there was a collaborative project to develop a publicly available LCI database for the U.S. (more specifically, the database contains cradle-to-grave data that can be used in completing an LCI). An effective rating system must track oil from the well to the station, but the measurement must be comprehensible to users. While current LCA evaluations exist that measure the specific effects on the environment in terms of

greenhouse gases and pollution scores, these evaluations may be too specific and scientific to be conveyed within an information provision disclosure. In addition, traditional LCA measures the effects from the general production process instead of a firm level. Industry wide evaluations may not lend the timeliness, cost efficiency and flexibility needed for a successful information provision (Golden, 2011). To reduce the costs of LCA evaluation and increase the flexibility of the ratings, the government should commission a simple LCA that tracks the path of oil production from well to station. Here, the life cycle analysis would simply link the production of the oil with the gas sold at pumps.

Once the information is compiled, it must be translated into a flexible metric. The metric must be salient to the consumers and address their most pressing concerns, but must also touch issues that can be targeted in industry behavior. An effective metric could include:

- Accident history: gallons spilled, impact on ecosystems, lives lost
- Self improvement: adoption of suggested reforms and safety improvements
- Compliance: infractions of existing regulations

There are several ways the metric could be rated: numeric (1-100) as seen in restaurant sanitation scores, a colored system such as the terrorist level alerts, a five-star evaluation like the vehicle safety rating. or simply an emblem that denotes an acceptable level of environmental stewardship like fair-trade systems. The numeric scale may be preferable as it gives a clear indication of performance, facilitates competitive scoring among firms and allows for the most variation in scoring.

Scores can be reflective of significant actions from the oil companies such as a large oil spill or a substantial investment in alternative energy, or can be based on a time schedule, such as updated every three months. To give the ratings legitimacy the government should oversee the construction and dissemination of the metric. Through a combination of government sources such as the LCI database and more thorough collection of oil distribution data to track which oil a gas station purchases, the government could combine public record and industry disclosure into a useable metric.

Once the government has compiled this metric, there are several ways it could be disseminated to the public. Legislation could mandate that gas stations post their environmental scores on prices signs. Though it is not a direct regulation on oil production, a government mandate of the rating may induce political opposition. An alternative approach may be incentivizing stations that have the best ratings to publicize the rating in order to capture the market share of consumers seeking the most responsible gas. Whether the rating is displayed because of regulation or firms wanting to differentiate their product, there must be public knowledge of the rating system.

Consumers are increasingly savvy with locating green products, and in addition to standard public notices, the rating can be disseminated through social media. Recently, there was a competition sponsored by the EPA for environmentally friendly applications for smartphones. One entry called FindGreenGarage allows you to choose a car garage within a certain radius that is certified “green” by government, state, and local green authorities.^{x1} The same premise could be used to find the highest ranked gas station within a certain distance.

C. Potential Limitations: Industry Responsiveness, Consumer Willingness and Political Feasibility

This model may encounter three main obstacles: 1) the connection between gas consumption and oil production, 2) consumers' willingness to pay for cleaner gasoline is not properly captured or utilized, and 3) mandating the information provision is just as politically infeasible as raising the liability cap or increasing funding to regulatory agencies. The next section will address each argument individually.

Linking Gas Consumption and Oil Production

Unfortunately, there is not a direct link between gas consumption and oil extraction because the major integrated oil companies only own about 4% of retail stations.^{xli} Private owners are licensed to represent a particular brand, but the gas sold does not directly affect the namesake oil company.^{xlii} However, as addressed through a refined LCA, it is still possible to track the specific gas a specific station sells, even if it is delineated into several types. Because there is not a direct link between the name at the station and the manner in which the gas was produced, the ratings of the oil companies would differ from the ratings of each station. The score assigned to oil companies on the basis of their accident rates, regulatory compliance, etc. would be assigned to the oil they produce, but also to oil that they refine and transport, even if it comes from a different source. This means the rating assigned to the gas station is an aggregate score from the companies that produce and handle the oil that they eventually sell.

The life cycle analysis would assign each gas station a score and allow the market differentiation of 'clean gas' vs. a 'dirty gas.' This would allow consumers to pressure the stations to provide more of the clean gas alternative, thus influencing

providers to increase their oil's environmental rating. Depending on the vertical integration of each oil company (to what extent they own the drilling, transport and refinery process, etc), the consumer demands must reverberate through several levels before it reaches oil production.

Consumer Willingness to Pay for Environmental Stewardship

Mintel Research released a report finding around 12% of the U.S. population regularly seeks out 'green' products and another 68% occasionally buys green products. "What chief marketing officers are always looking for is touch points with consumers, and this is just a big, big, big touch point that's not being served," says Mintel Research Director David Lockwood. "All the corporate executives that we talk to are extremely convinced that being able to make some sort of strong case about the environment is going to work down to their bottom line."^{xliii} But while there is a large rise in the popularity of green products, there is not a clear metric for evaluating the claims of green branding or promises of environmental sustainability. "One of the things you can definitely predict for the next few years is mass confusion, because where there's a void of government direction ... plus huge demand from consumers ... companies are going to be putting products out there with claims that can't be substantiated," says Lockwood.^{xliv}

In the case of the oil industry, they provide a product that will be essential to the average American for the foreseeable future. Because of oil's importance, any action taken to change its production will encounter fears of price increases. The rating system will only influence producers that fare the worst in terms of environmental safety. Since some producers are more effective in producing gas in a more environmentally responsible way, the firms will only change their production if there is significant market

pressure to do so. Since the information provision would simply put pressure on companies to improve their safety records, any changes in price would occur because the demand for cleaner gas increases, not because the supply of gas would decrease.

Political Feasibility of Information Provision

An information provision usually does not require extra costs through direct regulation but remains contentious because it forces firms to change their behavior. The oil industry has extreme political clout, and will most likely fight a provision that reveals flaws within their procedures. With those considerations in mind, the model addresses changes not through direct changes in the regulation and increased funding, but through the dissemination of already produced and reported information from the oil industry, BOEMRE and potentially private advocacy and watchdog organizations. The most politically contentious step will be in the mandating of clearly posting these rankings on gas pumps and/or prices signs. This step may be avoided if gas stations that already supply a higher quantity of environmentally friendly gas openly promote their environment score independently.

Because oil companies lobby for their product through greenwashing campaigns, it's difficult for them to explain that they do not want their safety record and government compliance publicized and evaluated. For Senators and Congressmen from states with significant revenue from oil (and oil industry campaign contributions), there is less argument that this will hinder gas production, jobs from the oil industry, or the expansion of oil infrastructure. This branding model simply would incentivize companies to operate in an environmentally responsible and risk-adverse manner.

VI. Conclusion

The BP gulf spill was an unacceptable tragedy that claimed 11 lives, severely damaged a delicate ecosystem and harmed many economies dependent on the Gulf of Mexico. The tragedy stemmed from a deficient safety culture, poor regulatory oversight, and negligible prioritization of the environmental and safety protocol. Though the BP commission suggested changes that would theoretically improve safety culture and government oversight, the suggestions have failed in the Senate and seem politically infeasible in the foreseeable future. Given that oil production is venturing into increasingly dangerous and environmentally sensitive realms such as the arctic and seeking leases in wildlife refuges, the oil companies must change their prioritization of safety and environmental concerns to prevent the next BP spill. Without the possibility of government regulation and funding increasing, changing the safety culture requires an alternative method. Through aligning the profit incentives of the oil industry with the market pressure for environmentally responsible production with an environmental rating, there is potential to minimize the environmental impacts of increased oil production.

No matter the specific dissemination, metric or logo of the environmental rating, a consumer based pressure to affect the safety culture and hence the oil industries' prioritization of environmental safety seems a more effective task than hoping for unattainable regulations and funding for regulatory enforcement. The BP spill commission suggests enhanced regulation and oversight, but perhaps that energy can be diverted to facilitate the informed decisions of consumers in the form of clear reports of

an oil company's compliance to regulation, accident rates and pollution emissions. As evidenced by numerous greenwashing campaigns, oil companies are aware of the growing demand for the "greenest" alternative. Mandating and publicizing already attainable information can foster competition and create a safety culture incentivized by the same underlying cause of the BP spill: profit.

References

Ayres, Ian (1995) "Responsive Regulation: Transcending the Deregulation Debate." New York: Oxford UP, 1995.

Barkenbus, J. N. (1983). "Is self-regulation possible?" Journal of Policy Analysis and Management 2(4): 576-588.

Becker, G. S. (1983). "A Theory of Competition Among Pressure Groups for Political Influence." The Quarterly Journal of Economics 98(3): 371-400.

Becker, G. (1968). "Crime and Punishment: An Economic Approach." The Journal of Political Economy 76(2): 169-217.

Bjorner, T. B. and L. Hansen, Russell, Clifford S. (2004). "Environmental labeling and consumers, An empirical analysis of the effect of the Nordic Swan." Journal of Environmental Economics and Management 47(3): 411-434.

Carraro, Carlo, and François Lévêque. (1999). "Voluntary Approaches in Environmental Policy." Dordrecht: Kluwer Academic.

Carter, J. P. (2006). "The Transformation of the Nuclear Power Industry." Power and Energy Magazine, IEEE 4(6): 25-33.

Cherry, M. A. and J. F. Sneirson (2010). "Beyond Profit: Rethinking Corporate Social Responsibility and Greenwashing After the BP Oil Disaster." SSRN eLibrary.

Elcock, D., 2007, "Life-Cycle Thinking for the Oil and Gas Exploration and Production Industry", ANL/EVS/R-07/5, Environmental Science Division, Argonne National Laboratory.

Flournoy, A., W. L. Andreen, et al. "Regulatory Blowout: How Regulatory Failures Made the BP Disaster Possible, and How the System Can Be Fixed to Avoid a Recurrence." SSRN eLibrary.

Fung, Archon, Mary Graham, and David Weil. (2007). "Full Disclosure: the Perils and Promise of Transparency." New York: Cambridge Univ.

Golden, Jay. Director of Duke Center for Sustainability & Commerce. Personal interview. (2011). Duke University.

Gunningham, N. A., D. Thornton, et al. (2005). "Motivating Management: Corporate Compliance in Environmental Protection." Law & Policy 27(2): 289-316.

Hahn, R. W. (1990). "The political economy of environmental regulation: Towards a unifying framework." Public Choice 65(1): 21-47.

Haines, F. (2009). "Regulatory Failures and Regulatory Solutions: A Characteristic Analysis of the Aftermath of Disaster." Law & Social Inquiry 34(1): 31-60.

Oil and Gas in a Bull Market: The Shifting Sands of Responsibility. Toronto, ON: Jantzi Research, 2006.

M. Khanna, Non-mandatory approaches to environmental protection. *J. Econ. Surveys*, 15 (2001), pp. 291-324.

Klassen, R. D. and C. P. McLaughlin (1996). "The Impact of Environmental Management on Firm Performance." Management Science **42**(8): 1199-1214

Singh, S., D. Vrontis, et al. (2011). "Green Marketing and Consumer Behavior: The Case of Gasoline Products." Journal of Transnational Management **16**(2): 84-106.

Widener, M. N. (2010). "Bridging the Gulf: Using Mediated, Consensus-Based Regulation to Reconcile Competing Public Policy Agendas in Disaster Mitigation." Albany Law Review, 2011.

End notes:

ⁱ Campbell, Robertson. "Gulf Spill Is the Largest of Its Kind, Scientists Say." Editorial. New York Times. 20 Aug. 2010. Web. 15 Apr. 2011.

ⁱⁱ Safety Culture. Rep. no. 75-INSAG-4. Vienna: International Nuclear Safety Advisory Groups, 1991. Print.
<http://www-pub.iaea.org/MTCD/publications/PDF/Pub882_web.pdf>

ⁱⁱⁱ "NOAA National Ocean Service Education: Prince William's Oily Mess." NOAA's National Ocean Service. US Department of Commerce. Web. 08 Dec. 2011.
<http://oceanservice.noaa.gov/education/stories/oilymess/oily01_infamous.html>

^{iv} "A Well-designed Disaster: the Untold Story of the Exxon Valdez." TheEcologist.com. 06 Nov. 2003. Web. 08 Dec. 2011. <http://yubanet.com/scitech/A_well-designed_disaster_the_untold_story_of_the_E_5766_printer.php>.

^v "NOAA National Ocean Service Education: Prince William's Oily Mess." NOAA's National Ocean Service. US Department of Commerce. Web. 08 Dec. 2011.
<http://oceanservice.noaa.gov/education/stories/oilymess/oily01_infamous.html>

^{vi} United States. Cong. Oil Spills in U.S. Coastal Waters Background, Governance, and Issues for Congress. By Jonathan L. Ramseur. Cong. Bill. [Washington, D.C.]: Congressional Research Service, 2010. Print.

^{vii} Deep Water: The Gulf Oil Disaster And The Future Of Offshore Drilling - Report to the President (BP Oil Spill Commission Report). Rep. Featured Commission Publications, 2011. Print. Page 100.

^{viii} Ibid

^{ix} Ibid, Page 222

^x "BP's Texas Refinery Fires, Leak Draw \$15 Million Fine." Environment News Service. 1 Oct. 2010. Web. 08 Dec. 2011. <<http://www.ens-newswire.com/ens/oct2010/2010-10-01-093.html>>.

^{xi} Offshore Oil and Offshore Oil and Gas Development Still Poses Major Risks Still Poses Major Risks, Testimony to the Committee on Energy & Natural Resources Cong. (2009) (Testimony of John F. Amos President, SkyTruth).

^{xii} U.S. EPA. Office of Solid Waste and Emergency Response, Office of Emergency Management, Regulation and Policy Development Division. Measuring Benefits of Oil Spill Prevention: Measuring Benefits of Oil Spill Prevention: Methods and Approaches Methods and Approaches. Web. <www.epa.gov/oem/docs/oil/fss/fss09/denning.pdf>.

^{xiii} Deep Water: The Gulf Oil Disaster And The Future Of Offshore Drilling - Report to the President (BP Oil Spill Commission Report). Rep. Featured Commission Publications, 2011. Print.

^{xiv} Safety Culture. Rep. no. 75-INSAG-4. Vienna: International Nuclear Safety Advisory Groups, 1991. Print.
<http://www-pub.iaea.org/MTCD/publications/PDF/Pub882_web.pdf>

^{xv} Lustgarten, Abrahm, and Ryan Knutson. "Years of Internal BP Probes Warned That Neglect Could Lead to Accidents." ProPublica. 7 June 2010. Web. 08 Dec. 2011.
<<http://www.propublica.org/article/years-of-internal-bp-probes-warned-that-neglect-could-lead-to-accidents>>.

^{xvi} Deep Water: The Gulf Oil Disaster And The Future Of Offshore Drilling - Report to the President (BP Oil Spill Commission Report). Rep. Featured Commission Publications, 2011. Print.

^{xvii} Refinery explosion and fire (15 killed, 180 injured) [electronic resource] : BP, Texas City, Texas, March 23, 2005 / U.S. Chemical Safety and Hazard Investigation Board

^{xviii} Altman, Alex. "The Case Against BP." *Swampland | Political Insight from the Beltway and beyond*. Time Magazine, 10 June 2010. Web. 08 Dec. 2011.
<<http://swampland.time.com/2010/06/10/the-case-against-bp/>>.

^{xix} Campbell, Keith. "Nuclear Safety Transformed by Three Mile Island and Chernobyl." *Engineering News* 11 Mar. 2011. Web.
<<http://www.engineeringnews.co.za/article/nuclear-safety-transformed-by-three-mile-island-and-chernobyl-2011-03-11>>.

^{xx} "Beyond Petroleum' Pays Off For BP · Environmental Management & Energy News · Environmental Leader." *Environmental Management & Energy News · Environmental Leader*. 15 Jan. 2008. Web. 08 Dec. 2011.
<<http://www.environmentalleader.com/2008/01/15/beyond-petroleum-pays-off-for-bp/>>.

^{xxi} "BP Alternative Energy." *BP Global | BP*. Web. 08 Dec. 2011.
<<http://www.bp.com/modularhome.do?categoryId=7040>>.

^{xxii} *ibid*

-
- xxiii Cheeseman, Gina-Marie. "Oil Companies and Greenwashing." *Green & Sustainable Business News | Triple Pundit*. 05 May 2005. Web. 08 Dec. 2011.
<<http://www.triplepundit.com/2008/05/oil-companies-and-greenwashing/>>.
- xxiv Exxon Mobil. Rex W. Tillerson Chairman and CEO, Exxon Mobil Corporation. Meeting Energy Challenges with Oil and Gas Technologies. The Academy of Medicine, Engineering and Science of Texas, 6 Jan. 2011. Web.
<http://www.exxonmobil.com/Corporate/news_speeches_20110106_rwt.aspx>.
- xxv Democratic Policy Committee. "How Much Are Oil and Gas Companies Investing in Clean Alternative Fuels?" 23 Apr. 2007. Web. 08 Dec. 2011.
<http://dpc.senate.gov/dpcdoc.cfm?doc_name=fs-110-1-64>.
- xxvi "Big Oil Releases Report Exposing Continued Refusal To Invest In Renewables." *ThinkProgress*. 15 June 2009. Web. 08 Dec. 2011.
<<http://thinkprogress.org/green/2009/06/15/174356/big-oil-little-renewables/>>
- xxvii "Big Oil Companies, Little Investment in Renewable Energy." *Energyme.com :: Energy | Oil & Gas | Technology | News*. 31 Mar. 2009. Web. 08 Dec. 2011.
<<http://www.energyme.com/energy/2009/200901000117.htm>>.
- xxviii Craig, Michael, and Jacqueline Savitz. False Sense of Safety Safety Measures Will Not Make Offshore Drilling Safe. Rep. OCEANA. Web.
<na.oceana.org/sites/.../OffshoreSafetyReport_Oceana_10-18-11.pdf>
- xxix Ibid
- xxx Ibid
- xxxi Howell, Katie. "Gulf Spill: A Year Later, Congress Sits Idly by -- 04/15/2011 -- *Www.eenews.net*." *E&E Publishing -- The Premier Information Source for Professionals Who Track Environmental and Energy Policy*. 15 Apr. 2011. Web. 08 Dec. 2011.
<<http://www.eenews.net/public/EEDaily/2011/04/15/1>>.
- xxxii Broder, John M. "Tougher Rules Urged for Offshore Drilling." *New York Times*. 11 Jan. 2011. Web.
- xxxiii Snow, Nick. "BOEMRE Budget Request Grows amid Cutbacks Elsewhere in DOI." *Oil&Gas Journal* (2011). Web. <<http://www.ogj.com/articles/2011/02/boemre-budget-request.html>>.
- xxxiv Linn, Joshua, and Nathan Richardson. "Instilling a Stronger Safety Culture: What Are the Incentives?" *Resources for the Future - RFF.org*. Web. 08 Dec. 2011.
- xxxv Fung, Archon, Mary Graham, and David Weil. *Full Disclosure: the Perils and Promise of Transparency*. New York [u.a.: Cambridge Univ., 2007. Print.
- xxxvi Khanna: *Non-Mandatory Approaches to Environmental Protection*
- xxxvii Fung, Archon, Mary Graham, and David Weil. *Full Disclosure: the Perils and Promise of Transparency*. New York: Cambridge Univ., 2007. Print.

xxxviii Fung, Archon, Mary Graham, and David Weil. Full Disclosure: the Perils and Promise of Transparency. New York [u.a.: Cambridge Univ., 2007. Print. Pg 87.

xxxix "Life Cycle Assessment (LCA) | Risk Management Research | US EPA." US Environmental Protection Agency. Web. 08 Dec. 2011. <<http://www.epa.gov/nrmrl/lcaccess/>>.

xl Apps for the Environment. EPA. Web.

<<http://appsfortheenvironment.challenge.gov/submissions/4579-findgreengarage>>.

xli "Marketing FAQ." American Petroleum Institute. Web. 08 Dec. 2011.

<http://www.api.org/aboutoilgas/sectors/marketing/>>.

xlii "Marketing FAQ." American Petroleum Institute. Web. 08 Dec. 2011.

<<http://www.api.org/aboutoilgas/sectors/marketing/>>.

xliii Hanas, Jim. "A World Gone Green | Special Report: Eco-Marketing - Advertising Age." Advertising Agency & Marketing Industry News - Advertising Age. 8 June 2007. Web. 08 Dec. 2011. <<http://adage.com/article/special-report-ecomarketing/a-world-green/117113/>>

xliv Ibid

Appendix 1:

Oil Regulation/Recommendation	Year
Following the Exxon Valdez oil spill, Congress unanimously passed the Oil Pollution Act of 1990. The act required oil companies to cover all spill-cleanup costs, but capped their liability for damages (such as lost wages and property damage) at \$75 million.	1990
MMS OCS Policy Committee’s Subcommittee on OCS Legislation issued an influential report calling for a major shift in federal offshore drilling policy toward increased oil and gas exploration The report drew significant attention in Washington, where deregulation and expanded drilling were steadily gaining support.	1993
Congress passed the Deep Water Royalty Relief Act, which granted a royalty “holiday” to oil and gas companies drilling in deep waters for leases sold between 1996 and 2000.	1995
President Clinton signed into law the Federal Oil and Gas Royalty Simplification and Fairness Act of 1996. The law, strongly supported by industry, aimed to simplify royalty collections by cutting down on paper work and reducing the accounting requirements for oil and gas producers.	1996
MMS issued a Safety Alert urging offshore leaseholders to install a backup mechanism for activating a rig’s blowout preventer (BOP) in the event of a blowout.	2000
A confidential risk assessment of the Deepwater Horizon’s BOP warned Transocean that 260 possible failure modes could keep the entire blowout prevention system from functioning.	2000
Congress passed the Energy Policy Act of 2005, giving MMS authority to expand energy-related projects on the Outer Continental Shelf.	2005
Department of the Interior Inspector General Earl Devaney testified before the House Subcommittee on Energy and Resources regarding “the institutional culture of managerial irresponsibility and lack of accountability” at MMS	2006
By not expressly prohibiting funding for drilling in fiscal year 2009, Congress allowed the 26-year old OCS drilling moratoria to expire. The moratoria began in 1982 with a prohibition against certain oil and gas exploration and production activities off the coast of California, and quickly widened to include almost all Atlantic and Pacific OCS areas, with the notable exception of the western and central Gulf of Mexico and parts of Alaska.	2008
March 30, President Obama announced a plan to lift the 20-year old moratoria on new offshore oil drilling off the southern Atlantic coast and in the eastern Gulf of Mexico.	2010
April 20 th , explosion of the Deepwater Horizon rig and beginning of the BP Gulf spill.	2010
May 30 th , U.S. Secretary of the Interior Ken Salazar issued a moratorium on all deepwater offshore drilling on the Outer Continental Shelf for a period of six months	2010
October 10 th , Obama Administration ends Moratorium on deepwater drilling in the Gulf of Mexico	2010
February 18, House Republicans defeated, by a vote of 251 to 174, an amendment to recover up to \$53 billion from federal leases in the Gulf of Mexico that allow oil companies to drill without paying royalties	2010
The Government issued its first deepwater drilling lease since the BP spill to Noble Energy on February 28 th .	2011
On March 1, House Republicans defeated, by a vote of 249 to 176, a Motion that would have repealed taxpayer-funded subsidies for oil companies	2011
Twice in May, Senate Democrats introduce their proposal raising the oil spill liability cap from \$75 million to \$10 billion twice, and finally proposed a bill that eliminated the liability cap. The bills did not leave the Senate.	2011

Table information reproduced from In Deep Water: Weak Governance and the Gulf Oil Spill, a 30-Year Timeline, and the Committee on Oversight and Government reform’s report, “Real Help For American Consumers: Who’s profiting at the pump?”