2018

Environmental Sustainability for Business Success

Kailyn Cohen
Ursinus College, kacohen@ursinus.edu

Kailyn Cohen
2018 Richard T. Schellhase Essay Contest in Ethics
Prompt 1: A Business – and Environmental – Turnaround?

Environmental Sustainability for Business Success

Sustainability in modern corporations has become more than just a consideration, but a necessity to preserve the earth for future generations. Human consumption of the earth's natural resources has tripled in the last 40 years and according to the UN, there will be more than 9 billion people with three times the global consumption by 2050.[1] Simple mathematics will dictate that corporations need to adopt environmentally sustainable practices to protect and maintain the current state of the earth. However, corporations should recognize their social responsibility and want to lead the transition into greener ways of doing business that are both economically practical and ethically responsible.

The energy industry is currently the dominant contributor to climate change, which accounted for 60% of the total global greenhouse gas emissions in 2017.[2] Since 2009, the US has been the world's largest natural gas producer, but the use of renewable energy has doubled since 2008.[3] Because energy efficiency of renewable sources increases directly with the development of more advanced technologies, traditional oil and gas companies are in a race against time, unless they decide to transition into renewable energy themselves. Exxon Mobil amid other major oil companies has invested $1 billion per year in renewable energy technology.[4] These ventures include biofuels made from genetically-modified algae and biodiesel from agricultural waste, yet both of these greener options are potential biohazards if industrial scale biological material were to leach into the environment. Conversely, companies that refuse to participate in the renewable energy movement suffer significant losses. Within the past six months, 37 oil and gas companies have had to file for bankruptcy in the US alone.[3]

Though EnerCo has traditionally focused on oil and gas development, a shift towards renewable energy is inevitable to survive in the current economic climate. Not only will investing in environmentally sustainable technologies help preserve the earth, but going green has been proven to increase profits as well. For instance, in 2000, DuPont made a commitment to reduce greenhouse gas emissions by 65%. By 2007, they were saving $2.2 billion per year through energy efficiency which equaled their total declared profits that year.[5] For both short and long term profitability, EnerCo should adopt a three pronged approach to sustainability that includes accident clean up, expansion into renewable energy, and accident prevention. Specifically, EnerCo should invest in reusable graphene sponges that capture and clean up oil from spills, carbon dioxide recycling technology, and specially equipped pipelines to prevent pipeline bursts.

To address the offshore oil spill that damaged the local ecosystem, EnerCo should invest in lase induced porous graphene sponges (LIG sponges) developed by the Materials Science Department at Rice University.[6] Conventional methods of cleaning oil spills consist of adding chemical dispersants to break down the oil into smaller droplets that can be spread throughout the water, effectively preventing most of the oil from reaching the shoreline. When British Petroleum (BP) leaked an estimated 3.19 million barrels of oil into the Gulf of Mexico in 2010, they used a dispersant called Corexit.[7] The dispersant and dispersed oil sank to the seafloor as a mixture 52 times more toxic than the crude oil itself, according to a study at Georgia Technical Institute.[8] The cleanup cost BP $14 billion and an

additional $70 million in personnel hours.[9] In stark contrast with this highly toxic and expensive method, LIG sponges are a safe, inexpensive way to not just hide and disperse the oil, but to collect it and protect the local ecosystem. Reusable LIG sponges absorb 100 times their weight in oil and can be mechanically compressed like a normal sponge to effectively recapture that oil. If BP had used these sponges and reused each ten times, then the material cost would be $2.52 billion dollars, and if BP were able to reclaim 80% of the spilled oil, there would be a net loss of only $2.22 billion.[6] Clearly, investing in this new, environmentally friendly technology will lead to significant savings. This will also show that EnerCo is serious about its commitment to long term environmental sustainability, instead of just being satisfied with using toxic, conventional methods for oil spill cover up.

To continue using highly toxic chemical dispersants in the full knowledge that they contain carcinogens, kidney toxins, and toxins to aquatic life would be ethically irresponsible. The driving factor behind BP's decision to use Corexit was to minimize the damage done to their public image. They wanted the ugly picture of BP oil across the Gulf of Mexico to disappear as fast as possible from the news and television screens at the expense of the environment. If EnerCo were primarily interested in protecting its public image, then there would be no major differentiation between using traditional dispersants and new nanotechnology, apart from the abundant financial savings. Using LIG sponges is not only the more inexpensive choice, but the more ethical one, as oil is actually collected and removed from aquatic ecosystems, thereby minimizing the damage done to the environment. Making this simple change will lend credibility to EnerCo's commitment to environmental sustainability and help to turn around EnerCo's environmental image.

In addition, expansion into the renewable energy sector will both decrease EnerCo's dependence on environmentally hazardous practices like fracking and increase its commitment to a more sustainable future. Fracking is known to contaminate ground water with toxic chemicals and carcinogens as well as use up substantial amounts of fresh water.[9] In light of EnerCo's declining profits, acquiring an already established renewable energy business may not be economically viable at present. Instead, EnerCo should invest in carbon dioxide recycling efforts that give back to the environment and to the economy. In 2015, the energy industry had an output of 6.5 million metric tons of carbon dioxide, one of the primary greenhouse gases that contribute to global warming.[2] Instead of releasing the carbon dioxide into the atmosphere, EnerCo should enter into an agreement with Liquid Light for them to use EnerCo's carbon dioxide for their chemical processes. Liquid Light is a company founded by Princeton University researchers that chemically transforms carbon dioxide into commercially useful products using sunlight to power their reactions. In essence, they take carbon dioxide directly from the source at coal plants and convert it into products like mono-ethylene glycol (MEG) which has an annual market of $27 billion, and ethanol, an alternative fuel source.[10] In 2015, The Coca-Cola Company signed a deal with Liquid Light for MEG, a major component of their biodegradable plastic bottles.[11] Though Coca-Cola had an existing MEG supplier, the company opted for Liquid Light because their chemical reaction pathways were at a lower cost than the traditional route already used to produce their Plant Bottles. Instead of burying the 1 million tons of carbon dioxide underground, a process known as carbon capture and storage (CCS), Liquid Light instead used the carbon dioxide to produce 625,000 tons of MEG per year. This translated to a cost of $640 per MT of MEG which is much less expensive than the current price of $1,000 per MT of MEG.[11] This allowed Liquid Light to produce its products more efficiently and with a smaller environmental footprint, which only added to Coca-Cola's green initiative.

EnerCo can similarly partner with Liquid Light to accelerate its own renewable energy initiatives by providing the carbon dioxide needed to produce ethanol, an alternative fuel source. EnerCo can then buy fuel produced through the less expensive chemical pathway for its own business operations or work out a partnership in which EnerCo and Liquid Light can jointly sell the alternative fuel and split the profits. Ethanol is an alternative, non-petroleum fuel source which does not produce as much carbon emissions as burning gasoline does.[12] It is combined with gasoline as an oxygenate additive and is usually produced from corn. The major drawbacks to using ethanol produced from corn is that food prices increase and the pollution caused by farming and processing of the corn outweighs the benefits of the ethanol.[12] Liquid Light is unique in that they use solar power to drive their reactions and begin not with corn, but with carbon dioxide. The major benefit to this plan would be to decrease EnerCo's dependence on fossil fuels and environmentally damaging processes like fracking.

The alternative to this plan would be to continue to release the greenhouse gas into the atmosphere which would exacerbate the negative effects caused by global warming, such as loss of biodiversity, rising sea levels, and ocean acidification.[2] Another alternative would be to use carbon capture and storage technology, but drawbacks to this technique are that carbon storage plants require more fuel to operate, thereby increasing carbon dioxide emissions, and that CCS has already been linked to severe environmental damage due to pipeline and reservoir leakage of carbon dioxide.[13] A third option would be to continue fracking which contaminates groundwater and the environment.[9] Choosing these alternatives when more environmentally friendly options are available would make EnerCo an accessory in a crime against nature, which incidentally will not help improve EnerCo's public image. By investing in carbon dioxide recycling technology, EnerCo will be able to reduce its carbon footprint while transitioning to an alternative energy source such as ethanol. In addition, investing in this particular company, which has already gained positive attention by working with major companies like Coca-Cola, would also improve EnerCo's environmentally friendly image. Ultimately, the decision to expand into the renewable energy sector will yield long and short-term environmental and financial benefits.

Finally, EnerCo should invest in safer oil transportation pipes and communicate with local communities during its development. EnerCo's involvement in the highly controversial oil transportation pipeline is much more complex than a simple environmental issue as it directly affects human communities. The decision to invest in specialized pipelines and devices rather than a publicity garnering event to gain public favor is steeped in sociopolitical considerations. For instance, the pipeline will undoubtedly contribute to carbon dioxide emissions which harm the environment, so any claims to the contrary will only serve to undermine the integrity of the company.[14] Additionally, the advancement of the pipeline is at the expense of Native American communities who continue to experience substantial, systematic discrimination in modern American society. In the case of the Keystone pipeline, the Treaties of Fort Laramie 1851 and 1868 were completely overruled, which state that no outside entity can use land belonging to the Great Sioux Nation without the Sioux people's consent.[14] Though TransCanada, the operator of the Keystone pipeline, continued to construct the pipeline, the company advertises on its website the number of meetings recorded with Native American communities.[15] While EnerCo should also reach out to Native American groups, the intent of the meetings would have to have a practical purpose far more sincere than just attracting positive press. It would be an insensitive, nominal meeting if EnerCo pretended to give Native Americans a voice, in the full intention of continuing construction as planned. Meetings should be held to adjust the pipeline route to avoid areas of high current or historical importance, such as schools, homes, or burial grounds. Pretending that the

pipeline is a welcome addition to the landscape would be foolish, and some compromises cannot be made; however, with open communication, EnerCo could incorporate new ideas to lessen the negative impact of its pipeline.

Because EnerCo has heavily invested in this pipeline and will financially benefit from its completion, pulling out of the project is not economically advisable as EnerCo has recently experienced stagnant and declining profits. Even if EnerCo discontinued its financial support, the pipeline would still exist and contribute to greenhouse gas emissions. In the interest of protecting the environment and having an influence on the manner in which the pipeline is installed, EnerCo should continue to be involved in its development. To minimize the environmental damage, leak prevention is a top priority. While there clearly need to be protocols in place to monitor the pipeline for leaks, EnerCo should not invite itself onto Native American land and insensitively set up provisional guarding stations, as doing so would be insensitive and invasive. Instead, EnerCo should ensure the safety of the pipes through technological means, which are more precise and instantaneous, by investing in automatic shut-off valves that work by detecting changes in pressure and industry termed smart pigs, which are devices that monitor internal pipe conditions such as corrosion and cracks.[16] These two preventative measures could have minimized the damage of the Kalamazoo River oil spill in 2010, which lasted 17 hours before operators were able to locate and manually shut off the pipeline.[17] During this time, an estimated 840,000 gallons of oil leaked into the Kalamazoo River, damaging the local ecosystem and costing the Enbridge Energy Inc. $1.2 billion in oil spill cleanup. Since involvement in the transportation pipeline should be continued, EnerCo has great social responsibility to protect the people who live around the area from experiencing an oil leak as well as a responsibility to protect the local environment. Though automatic shut-off valves cost $1 million and smart pigs cost $350,000, their incorporation into the pipeline will save EnerCo more money in the future by preventing loss of valuable oil and the millions of dollars in cleanup.[16]

The oil transportation pipeline is more than about moving oil from one place to another, it is about the integrity of the company and how much that company cares about the local people and environment through the preventative measures they choose to put in place. Investing in these two practical and effective measures will send a strong message about EnerCo's commitment to safety and sustainability. EnerCo could, as is the oil industry standard, calculate the bare minimum amount of security measures needed per pipeline based on whether the pipeline is located in a high risk area.[17] While cutting corners may shave off a few thousand dollars at the start, a single oil spill like that of Kalamazoo could cost more than a billion dollars in cleanup and lost product, as well as damage the local ecosystems and communities. Though high risk areas can be calculated and accounted for, the earth is everywhere and should therefore be protected everywhere with the modern technology we have at our disposal. Making this investment now will help to improve EnerCo's public image by providing evidence for our commitment to become environmentally responsible while preemptively protecting EnerCo from a fourth scandal.

In conclusion, sustainability is the way forward. As the world moves towards a more sustainable future, corporations need to adapt their practices and services or face extinction themselves. For EnerCo, this means investing in renewable energy options and new technology to better address accidents. The reality is that accidents happen, and when they happen, the environment suffers, local communities suffer, and the company responsible for the accident suffers. Saying that accidents happen is not enough to sustain the earth, but recognizing reality and putting measures in place to account for these scenarios

are part of leading a sustainable company. Since EnerCo's recent declining profits coincide with the three recent environmental scandals, this proposal aims to increase profits by minimizing the economic and environmental damage done by accidents, as well as enter in the renewable energy sector to move away from environmentally hazardous practices like fracking. Though profitability drives businesses, integrity is the main factor that contributes to long term success. For EnerCo to succeed into the future, it must accept the mantle of making decisions that go beyond the bottom line for the benefit of communities, the environment, and future generations.

Works Cited

1. UN. “World Population Projected to Reach 9.8 Billion in 2050, and 11.2 Billion in 2100 – Says UN - United Nations Sustainable Development.” United Nations, United Nations, 2018, www.un.org/sustainabledevelopment/blog/2017/06/world-population-projected-to-reach-9-8-billion-in-2050-and-11-2-billion-in-2100-says-un/
2. EPA. “Global Greenhouse Gas Emissions Data.” EPA, Environmental Protection Agency, 13 Apr. 2017, www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data.
3. Mergent. “Exxon Mobil Industry Reports.” Mergentonline.com, Nov. 2017, www.mergentonline.com/documents.php?pagetype=industryreport&compnumber=2907.
4. Hirtenstein, Anna. “ExxonMobil Is Spending $1bn a Year Researching Renewable Energy.” The Independent, Independent Digital News and Media, 3 Nov. 2017, www.independent.co.uk/news/business/news/exxonmobil-renewable-energy-research-oil-company-development-biofuels-algae-electricity-a8035496.html.
5. Forbes. “Can Businesses Be Environmentally Sustainable And Still Make Money?” Forbes, Forbes Magazine, 8 Feb. 2017, www.forbes.com/sites/quora/2017/02/08/can-businesses-be-environmentally-sustainable-and-still-make-money/#694091495a50
6. Oueslata, A. Laser Induced Porous Graphene Sponge. Rice University, 2015, mse.umd.edu/sites/default/files/documents/undergrad/enma490/Laser%20Induced%20Porous%20Graphene%20Sponge-Presentation.pdf.
7. D, Shanna. “Cleanup or Cover-up? What BP and the EPA Did to the Gulf.” Washington Spectator, 13 Dec. 2016, washingtonspectator.org/cleanup-or-cover-up-what-bp-and-the-epa-did-to-the-gulf/.
8. Rico-Martinez, Roberto, et al. “Synergistic Toxicity of Macondo Crude Oil and Dispersant Corexit 9500AÂ® to the Brachionus Plicatilis Species Complex (Rotifera).” Environmental Pollution, vol. 173, 2013, pp. 5–10., doi:10.1016/j.envpol.2012.09.024.
9. EPA. “Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States.” Science in Action, 2017, www.epa.gov/sites/production/files/2016-12/documents/hf_final_assessment_fact_sheet.pdf.
10. Liquid Light. “Make Carbon Dioxide a Practical Feedstock for Multi-Carbon Chemicals.” Liquid Light, 2018, llchemical.com/about/.
11. LuxResearch. “Coca-Cola Collaborates With Liquid Light to Accelerate Its CO2 to MEG Process | Lux Spotlight.” Lux Spotlight Blog by Lux Research, 21 Aug. 2015, luxresearchinc.com/blog/2015/08/coca-cola-collaborates-with-liquid-light-to-accelerate-its-co2-to-meg-process/.
12. Rinkesh. “What Is Ethanol Fuel and Advantages and Disadvantages of Ethanol.” Conserve Energy Future, 18 July 2017, www.conserve-energy-future.com/ethanol-fuel.php
13. Climate Vision. “The Negatives of Carbon Capture and Storage.” Climate Vision RSS, 2017, climatevision.co.uk/the-negatives-of-carbon-capture-and-storage.
14. Diotalevi, R, and S Burhoe . “Native American Lands and the Keystone Pipeline Expansion: A Legal Analysis.” Forensic Res Criminol Int J, vol. 6, no. 1, 2018, pp. 1–7., doi:10.15406/frcij.2018.06.00180.
15. TransCanada. “Working with Indigenous Groups.” TransCanada – Indigenous Overview, 2018, www.transcanada.com/en/commitment/indigenous/.
16. Mitchell. “RBN Energy.” "wooo – pig – sooie!" - The Business of Pipeline Integrity II | RBN Energy, 2018, rbnenergy.com/wooo-pig-sooie-the-business-of-pipeline-integrity-ii.
17. Groeger, Lena. “Pipelines Explained: How Safe Are America's 2.5 Million Miles of Pipelines?”ProPublica, 2018, www.propublica.org/article/pipelines-explained-how-safe-are-americas-2.5-million-miles-of-pipelines.