A Commodity Chain Analysis of Crude Oil

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Crude oil, also known as petroleum, is essentially a commodity that human life is centered around—it is a commodity that is unavoidable, for we both directly and indirectly make encounters with it on a daily basis. On average, Americans use about three gallons of oil per day—one gallon for travel, one gallon for products, and one gallon for food (Crude, 2008). Fuel oil and gasoline are commonly known derivatives of crude oil that are used in many modes of transportation such as cars and planes. "Petrochemicals [another derivative of crude oil] have become indispensable components of human society;" they are ingredients to nearly all products, ranging from plastic to fertilizer. Although oil may not directly be in our food, it is used both in its transportation, with the fuel used by vehicles and the asphalt upon which the vehicles travel, and its packaging (Crude, 2008). Additionally, oil is a fundamental component to today's global economy. In fact, there are countries whose entire economy revolves around oil. For example, the United States imports a total of sixty percent of the oil it consumes while it domestically produces the remaining forty percent ("Some Interesting," 2007). In general, oil is an integral part of modern society and civilization and (Crude, 2008), therefore, it is important to know the process by which it arrives to us, the consumers, and what factors contribute to and result from its widespread use.

Throughout this essay, I focus on the production chain of crude oil by using information from online research and the movie Crude. First, I discuss where crude oil comes from and then move onto how it is extracted, manufactured, what it is used for, how it is transported, and where it travels after being refined. In my discussion, I include references to the Chevron Corporation, a global energy company. I also use the company as an example of how oil corporations may market their products. Afterwards, I explain the social, economic, and political conditions that exist in Nigeria and Burma, two countries in which Chevron operations exist. I end the essay
with a discussion of the environmental impact of oil production and consumption and a
speculation upon what the future of crude oil may be. Crude oil can be found in places all over
the world and we, humans, have become dependent upon its versatility. Because it is a natural
resource, its production chain is not as complicated as that of other commodities; however, the
high demand for crude oil has created controversy such as that over locations in which drilling
for the commodity should and should not take place. At heart, the business of oil, though
lucrative, perpetuates global inequality and the violation of human rights as well as continues to
make grave impacts on the environment; as time progresses, the future of this bittersweet
commodity is becoming increasingly dubious.

Where Does Oil Come From?

During the Carboniferous Period—around three hundred million years ago—decomposed
plant and animal matter formed what we, today, call fossil fuels ("Fossil," 2001). Over time, the
decomposed matter was covered by layers of sand, clay, and other minerals, transforming it into
sedimentary rock (California Energy Commission, 2006). This decomposed matter, called
biomass, has transformed into a hydrocarbon-rich liquid, that we call crude oil, as a result of
gеologic heat and pressure over time. This crude oil has been forced into porous rock strata in
underground regions called reservoirs from which we obtain our oil (Energy Information
Administration, 2008). Oil reservoirs are not everywhere, however—they only exist where the
special geological conditions needed for crude oil to be formed have occurred.

Clearly, crude oil is a valuable natural resource—it is sunlight captured in fossilized
brainless organisms (Crude, 2008). In order to use it, it is necessary to drill it out of the earth
first. Prior to the drilling process, scientists and engineers test an area for a minimum amount of
oil. ‘Derricks’ are situated above drilling holes for the purpose of accommodating tools and pipes
used in the well. After drilling is finished, oil flows somewhat naturally to the earth’s surface ("Petroleum," 2001). The Middle East has the largest oil reservoir on earth; the reason why two-thirds of the world’s oil supply is able to come from this region is the special geologic conditions that have existed there in the distant past (Crude, 2008). As of 2005, the top ten countries with the greatest oil reserves in order from greatest to least were Saudi Arabia, Canada, Iran, Iraq, Kuwait, United Arab Emirates, Venezuela, Russia, Libya, and Nigeria (Workman, 2006). Presently, members of OPEC, the Organization of Petroleum Exporting Countries, include: Iran, Iraq, Kuwait, Saudi Arabia, Venezuela, Qatar, Indonesia, Libya, United Arab Emirates, Algeria, Nigeria, Ecuador, and Angola ("OPEC," n.d.). This organization is responsible for setting the prices of oil in the global economy. Finally, “key operations” of the Chevron Corporation, which I continue to discuss throughout this essay, exist “in the world’s most important oil and gas regions” including Kazakhstan, Thailand, Indonesia, Nigeria, to name a few ("Our Businesses," 2008).

How is Crude Oil Extracted?

The process of extracting crude oil takes place in oil producing countries. To start off, wells are drilled into oil reservoirs. As previously mentioned, oil generally naturally flows to the earth’s surface after the drilling process; however, after the drilling is complete, there are several methods used to get the oil out. Primary production methods include the “natural lift” and the “artificial lift.” The “natural lift” relies on natural reservoir pressure while the “artificial lift” involves mechanical pumps powered by electricity or gas. The “artificial lift” is used when natural pressure dwindles down. “Secondary” production methods include “waterflood” when water is injected into a reservoir in order to increase pressure within it. “Tertiary” or “enhanced” oil recovery methods increase the flow characteristics of oil and are carried out by injecting
steam, carbon dioxide, and other gases or chemicals into a reservoir (Energy Information Administration, 2008). Finally, ‘gathering’ pipelines are used in areas where crude oil is located deeper in the earth. Within the United States, gathering lines are concentrated in Texas, Oklahoma, Louisiana, and Wyoming (“Pipeline,” 2007).

How is Crude Oil Manufactured, What is it Used For, and How is it Transported?

Regions of the world where crude oil is found are different from regions in which the oil is processed and regions in which the oil is consumed so, from its location of extraction, crude oil travels to a refinery via crude oil pipelines. The largest network of energy pipelines in the world is located in the United States, and the country’s most famous crude oil pipeline is the Trans Alaska Pipeline System, or TAPS. The Trans Alaska Pipeline System is an example of ‘trunk’ pipelines which are used to transport oil from producing areas to refineries (“Pipeline,” 2007). Pipelines are privatized; in other words, pipeline systems are owned and operated by oil companies such as Shell, BP, ExxonMobil (“Pipeline,” 2007), and Chevron. In addition to these corporations, there are companies that are solely involved in the pipeline portion of the oil production chain that own and operate these lines. Furthermore, power and chemical plants may also own and operate pipelines. The Chevron Corporation owns a system of pipelines in North America through Chevron Pipe Line Co., and outside of North America, it operates and invests in pipeline projects including the following: The Caspian Pipeline Consortium, The Chad/Cameroon project, The West African Gas Pipeline, The Baku-Tbilisi-Ceyhan pipeline, and The Baku-Supsa pipeline (“Our Businesses,” 2008). In countries such as the United States, in which pipelines are privatized, “companies are responsible for the safety and reliability of their own pipeline systems.” In addition, companies are monitored by federal and state regulators in order to ensure they are following federal and state policies (“Pipeline,” 2007). Later on, I will
discuss issues affiliated with pipeline security and how pipeline security can have detrimental affects on local populations.

After traveling through crude oil pipelines, the crude oil arrives at a refinery where the oil is separated into usable and non-usable components ("Petroleum," 2001). The thick, black oil is separated into different products by heating (California Energy Commission, 2006). Hundreds of hydrocarbon molecules of different shapes and sizes are sorted out and split apart and joined together in order to create new molecules (Crude, 2008). As a result, crude oil is refined into multiple products. For example a barrel of oil is, on average, 19.5 gallons gasoline, 9.2 gallons distillate fuel oil, 4.1 gallons jet fuel, 2.3 gallons residual fuel oil, 1.9 gallons liquefied gases, 1.9 gallons still gas, 1.8 gallons petroleum coke, 1.3 gallons asphalt/road oil, 1.2 gallons feedstocks, 0.5 gallons lubricants, 0.2 gallons kerosene, and 0.3 gallons other oil (California Energy Commission, 2006). As an energy source, oil is one of a kind. It burns just as wood and coal; however, it is a liquid so it is easily transported. It can release one hundred times more energy than is used to extract it. In essence, "it has an astonishing amount of energy in a small volume" (Crude, 2008).

Just as oil production sites are located in different regions around the world, so are oil refineries. Major refineries that the Chevron Corporation uses are located in North America, Western Europe, South Africa, and the Asia-Pacific rim ("Our Businesses," 2008), and the top ten oil exporting countries from greatest to least are Saudi Arabia, Russia, Norway, Iran, Venezuela, United Arab Emirates, Kuwait, Nigeria, Mexico, and Algeria (Workman, 2006).

Where Does the Oil Travel After Being Refined?

The derivatives of crude oil that result from the refining process travel through refined products pipelines to terminals and local distribution centers. Trucks and ships are also used for
shorter distances or in areas where pipelines do not exist. After reaching terminals and local
distribution centers, refined products are dispersed among companies and consumers ("Pipeline,"
2007). For example, Chevron service stations are located on the West Coast of North America,
The United States Gulf Coast, Latin America, Asia, sub-Saharan Africa, and the United
Kingdom. Just like it has a pipeline company, Chevron Pipe Line Co., Chevron has a shipping
company—Chevron Shipping Company—that the company uses to transport crude oil products
("Our Businesses," 2008). Finally, as of 2004, the top ten oil importing countries from greatest to
least were the United States, Japan, China, Germany, South Korea, France, Italy, Spain, India,
and Taiwan. (Workman, 2006).

How Does Chevron Market its Products?

Chevron markets itself through three brands: Chevron, Texaco, and Caltex. Chevron
stations are located in the western United States and British Columbia, Canada; Texaco stations
are located in the United States and in Latin America; and Caltex stations are located in Asia-
Pacific countries and in Africa. Under the brand Techron, Chevron has begun to use an additive
in its fuel that allegedly helps to keep engines clean. Additionally, Chevron boasts of its
enforcement of health, environmental, and safety concerns. The corporation has a Road
Transport Safety program and an underground storage tank system assessment and replacement
program that reputedly maintain safety along the production chain of crude oil ("Our

What are the Social, Economic, and Political Conditions That Exist in Nigeria and Burma?

On the surface, the business of oil may seem harmless but, due to its grave economic
importance, it is a cause of both social and political turmoil. In order to give an accurate
depiction of the problems that arise from crude oil, I have chosen to focus on two of the many
countries in which Chevron operations exist—Nigeria and Burma. In both Nigeria and Burma, Chevron and other oil companies, such as Shell, have been associated with human rights violations. In Nigeria, repressive and corrupt governments have had a mutual relationship with oil corporations in which the government receives support from oil corporations and oil corporations are able to profit from Nigeria’s abundant natural resources. Additionally, the presence of these oil corporations in Nigeria has contributed to the loss of property, price inflation, prostitution, and irresponsible fathering by expatriate oil workers. Sadly, it is difficult for any Nigerian to speak up against these circumstances because any protest to unfair conditions is counteracted by military repression and, sometimes, death. Furthermore, as previously mentioned, it is not uncommon for military forces to be aided in repression by oil companies. Rather than promoting the interests of Nigerians, “oil companies act as a destabilizing force, pitting one community against another, and acting as a catalyst—together with the military with whom they work closely—to some of the violence racking the region today” (“Nigeria,” 2008). In other words oil companies, like all corporations, have the sole goal of making a profit—it does not matter what or who is sacrificed, whether it be human rights, freedom, or liberty, as long as they achieve their ultimate goal.

Like in Nigeria, oil companies such as Chevron maintain a symbiotic relationship with the military regime in Burma (“Nigeria,” 2008). In order to maintain security of the Yadana pipeline in Burma, Chevron depends upon the Burmese military. At first glance, this relationship may seem legitimate, and it would be if the Burmese military simply obeyed human rights. The Burmese military regime has been known to conscript soldiers to forced labor, carry out acts of violence, and terrorize the local population. Despite these human rights abuses, Chevron has continued to carry out oil operations in Burma and support the Burmese military force (“Report,”
2006), once again showing how meaningless the interests of individual people not even a part of the crude oil production chain are in comparison to those of the corporation.

In addition to the social and political troubles in Nigeria caused by crude oil, the country also suffers from economic inequality. Because the Nigerian economy is centered around oil, the amount of inequality in wealth in the country remains high. The few who profit from the crude oil business are either those who are involved in the government or those who are affiliated with the oil companies. The rest of the population suffers from extreme poverty without any funding for resources or infrastructure ("Nigeria's," 2001). This unequal distribution of wealth that exists in Nigeria today contributes to both social stratification in Nigeria and the world. Without adequate funding, average Nigerians lack equal opportunity and the methods to progress in life. Furthermore, it is easy to see that oil corporations not only prevent the advancement of people in countries such as Nigeria and Burma, but also promote retrogression, reinforcing global inequality.

What are the Environmental Impacts of the Oil Production and Consumption?

In addition to its political, social, and economic ramifications, oil production and consumption has several environmental repercussions. Despite Chevron’s claim to have a concern for the environment, it has committed more than a handful of environmental violations. Furthermore, while it supports a number of environmental programs it simultaneously funds groups that advocate for the environmental deregulation of corporations. Of course, negative affects on the environment translate into negative affects on our health. A few environmental concerns affiliated with Chevron that have been raised include the dumping of dangerous waste from oil refineries into drinking water, oil spills from modes of transportation of oil, and global
warming ("Chevron," 2000). While all three of these environmental issues have dire consequences, the most visible and widespread one is global warming.

By burning fossil fuels, humans release carbon dioxide that has been trapped within in the earth back into the atmosphere, creating a greenhouse effect. In short, the greenhouse effect is the rise in earth’s temperature as a result of certain gases in the planet’s atmosphere—water vapor, carbon dioxide, nitrous oxide, and methane—referred to as greenhouse gases that trap energy from the sun ("Greenhouse," 2008). In addition, we are mimicking this phenomenon at an accelerated speed—we are rapidly reversing a process that took hundreds of millions of years in just a couple of centuries. The burning of fossil fuels is leading to the increase in carbon dioxide in the earth’s atmosphere which is, in turn, leading to the increase in temperature. This increase in temperature causes polar ice to amplify the effects of global warming—the higher the temperature, the less ice there is to reflect rays from the sun. As a result, the ocean absorbs more and more light and, in turn, temperatures continue to rise and melt polar ice, thereby completing the cycle. Furthermore, the telling effects of global warming get worse each second and the spread of cars, suburbs, and roads across the world into present-day industrializing countries such as China and India is doing little to help prevent this phenomenon (Crude, 2008).

What is the Future of Oil Production and Consumption?

An irreplaceable and one of a kind resource, oil has really put the human race into a bind. In such a short amount of time, we have used half of the world’s crude oil supply. Our increasing dependency and addiction to oil has led us to have a growing amount of oil consumption each year. As previously mentioned, it took millions of years for oil to be formed by geological circumstances, and now we are reversing that process in an extremely small fraction of that time. Dealing with the environmental repercussions of oil production and consumption is inevitable
and so is the fact that we are running out of the driving force of our global economy, crude oil. There are optimists who continue to believe that there will be new discoveries and new technology that will allow us to find new drilling sites. However, in reality, the majority of the earth has already been surveyed for oil. In terms of the global oil supply, the global economy, and the environment, the future is extremely bleak. Pretty soon, it will be necessary for people to seriously begin looking into alternative forms of energy (Crude, 2008). In fact, oil corporations have already begun to privatize alternative forms of energy. For example, the Chevron Corporation has begun monopolizing biofuels. In 2007, Chevron tested Biodiesel in California and marketed it in the Phillipines and Portland, Oregon ("Our Businesses," 2008). In the end, the entire picture of oil production and consumption is quite incongruous when analyzed. Ironically, "crude drives the civilization that pumps the gas"—this scenario is inevitably going to have to change as we pay the price for lacking foresight and taking the precious natural resource of crude oil for granted (Crude, 2008).
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