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Cleaner and Greener Doesn't Always Mean Clean and Green

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As our country continues to bear the badge of outrageously high carbon emissions per capita, it leaves many scientists and citizens searching for cleaner energy sources. Unlike other developed countries, the United States energy policy does not yet enforce the use of renewable energy on a large scale. Moreover, since a solid market hasn't yet surfaced for clean green sources of energy, many people have been encouraged to use natural gas, a cleaner alternative to coal and petroleum products. However, mining this "clean" source of energy is endangering local ecosystems and jeopardizing the health of humans living in areas where hydraulic fracturing is used to mine natural gas. Much of the mining process goes unregulated and unsupervised largely due to lack of policies to be enforced by government agencies protecting humans and natural resources.

The push for domestic energy production becomes increasingly important as Americans continue to import other forms of energy (e.g., petroleum) from antagonistic regions wealthy in natural resources. The U.S. is dappled with productive natural gas reservoirs that vary in size and offer a relatively clean source of domestic energy. The United States Energy Information Administration estimates that roughly 284 trillion cubic feet of natural gas exist beneath our soil. However, private companies dominate the market, and they have one thing in mind: profit maximization through efficiency. Efficiency is often denoted as a positive attribute to energy production. But the word "efficient" doesn't tell the whole story.

Hydraulic fracturing is a mining process used in nearly 90% of oil and gas wells to increase yield or efficiency. Certain reservoirs that would yield very little natural gas with traditional mining methods can now be harvested in extremely large quantities with the use of Hydraulic Fracturing (fracking).

The basic concept is to drill holes to the desired depth and inject a fluid containing proppants with enough pressure to fracture the existing subsurface rock units. The newly introduced fractures in these impermeable layers of rock act as a passageway and sink for existing carbon-rich organic matter that will eventually be used as fuel. Once the fracturing is complete, the fluids are extracted from the ground and separated to obtain the desired fuel, leaving millions of gallons of toxic fluid that cannot be properly disposed of in the natural world. Fracturing wastes are not regulated as a hazardous waste under the Resource Conservation and Recovery Act.

Economically this seems like a brilliant idea. This cheap and efficient method can provide relatively clean fuel to consumers at a low cost. However, both economists and environmentalists recognize that the natural ecosystems and the organisms in it internalize the actual cost of this process, not the consumers—resulting in a market failure.

The ingredients used in this process are not regulated by federal government agencies. The exact reason is unknown. Only recently have the companies been asked to voluntarily submit a list. The Congressional Research Service concluded that between 2005 and 2009, the 14 leading oil and gas service companies used more than 2,500 hydraulic fracturing products containing 750 chemicals that are not approved.

Under the Bush/Cheney administration, fracking was deemed exempt from the Energy Policy Act of 2005. The Safe Drinking Water Act (SDWA) was amended to allow the use of fluids or propping agents (other than diesel fuel) pursuant to hydraulic fracturing. Therefore, the EPA lacks authority under the SDWA to regulate hydraulic fracturing where diesel isn't used as an agent. This leaves some people questioning the ties between Haliburton (a major U.S. oil and natural gas company) and Cheney, the vice president at the time and a former CEO of Haliburton.

Since the EPA lacks authority-enforcing regulations on this mining process individual states are left to deal with the fracking issues. In some situations, states are slow to react to this relatively new phenomenon and fail to investigate the situation and enact policies regulating fracking. This leaves people unfortunate enough to be located near these sites (some sites have even been approved on public ground) in a vulnerable position.

Josh Fox released an amazing documentary entitled "Gasland," exposing fracking to the public. In this documentary, Fox interviews many landowners affected by fracking. The video shows multiple cases of contaminated, discolored water coming from rural wells. In some cases, if provided a spark, fire would shoot from the faucet when turned on. This water is not drinkable and in some cases is directly connected to serious health issues in humans and animals, according to the interviewees. Meanwhile, under the law, these large corporations aren't held accountable for their actions and are not responsible for compensation for damages. Since these companies aren't yet held accountable for their actions, it cannot be proved that the mining is directly related to the water contamination -- just an odd coincidence.

The EPA is currently undergoing a lengthy hydraulic fracturing investigation process addressing water acquisition, chemical mixing, well injection, flowback, and produced water and wastewater treatment and disposal. The results will be compiled and a final document will be available in 2014. This investigation is a step toward developing a set of effective policies that will protect humans and the natural world while still allowing efficient methods of mining to be used.

With clean water becoming increasingly important to our future on this planet (as illustrated by the current Keystone XL debate), it is important to effectively weigh the

costs and benefits of this process. How long will it be until the United States develops a set of policies that will completely regulate this mining process to protect the health of its citizens and the natural world?