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Ethanol: A Stepping Stone

In his analysis entitled “Ethanol Fuels: Energy Balance, Economics, and Environmental Impacts are Negative,” Dr. David Pimentel of Cornell University argues that ethanol production from corn is not a practical alternative fuel source and it should not be pursued. Like any other new technology, ethanol has been closely evaluated since its conception in order to determine whether or not it is a valuable resource worth pursuing. Opponents of Dr. Pimentel claim that because of the increasing demand for fuels similar to petroleum, alternative fuel sources like ethanol are needed and should be used. Dr. Pimentel would argue that by focusing on the need for alternative energy sources people are overlooking the fact that ethanol is not as efficient as gasoline, it has negative economic effects, and it pollutes the environment.

The main argument presented in the analysis is that ethanol requires twenty nine percent more energy than it can produce (Pimentel 128). Since ethanol production would require more energy than it could in turn create, Dr. Pimentel believes that it makes sense to abandon the production of ethanol. In addition to the energy loss of ethanol, he also writes that ethanol is not economically safe. While government politicians argue that producing ethanol in the United States will greatly benefit farmers, Dr. Pimentel writes that their profit increases will be so minimal, it won't even matter. The only reason ethanol is even being produced is because of the 1.4 billion dollars in government subsidies that allow the business to remain out of debt (Pimentel 129). The last argument that Dr. Pimentel makes is that ethanol production has negative effects on the environment. The amount of fertilizer, fossil fuels, and pesticides used to grow the corn all contribute to the degradation of the environment. In short, Dr. Pimentel writes that “Ethanol is not a net additional energy source, it is an uneconomical fuel, and its overall production system causes serious environmental degradation” (132).

Although I agree with Dr. Pimentel up to a point, I simply cannot accept his overall conclusion that ethanol is a negative alternative energy source. Dr. Pimentel argues that ethanol is a bad choice as an alternative fuel source, it has a negative effect on the economy, and it degrades the environment. I would

argue that ethanol is still a relatively new discovery that should be explored and researched before it is completely abandoned. Ethanol should continue to be researched and used because it is environmentally friendly, good for the economy, and an energy efficient stepping stone to other alternative fuels.

Ethanol is better for the environment than traditional gasoline. Ethanol is a relatively new source of energy that burns much cleaner than traditional petroleum-based energy sources such as gasoline or diesel fuel. The federal government has even cited ethanol as one of the nation's solutions to the growing energy crisis. President Bush has ordered a twenty percent reduction in gasoline use through programs like ethanol production (Hahn, par. 5). One of the main benefits of ethanol is its ability to reduce the amount of greenhouse gases such as carbon monoxide, carbon dioxide, and hydrocarbons that is released into the atmosphere by traditional gasoline powered automobiles. Estimates as to how well ethanol will be able to reduce the amount of greenhouse gases tend to vary from source to source; however, some estimates are as high as thirty five to forty six percent (Kantor, par. 7) while other estimates are much lower around twelve percent (Tilman, par. 1). Although this may not seem like much when compared to the amount of carbon dioxide released into the atmosphere on a yearly basis, studies have shown that in 2005 nearly 7.8 million tons of carbon dioxide pollutants were reduced from the atmosphere because of ethanol use ("Ethanol Information").

One aspect of ethanol production that needs special attention is the amount of pollutants that reach river systems and the soil systems due to the high quantities of insecticides, pesticides, and nitrogen fertilizers used to grow corn (Pimentel 127). According to Dr. Pimentel, corn requires large amounts of nitrogen fertilizers and other chemicals to help the crop produce a high yield. Some of these chemicals that are used to grow the corn are then transferred from the corn fields to the environment. In recent years a few of these chemicals have been linked to health conditions such as heart congestion, low blood pressure, and muscle spasms (Kantor, par. 12).

Although I grant that ethanol is not perfect, I still maintain that it is a new alternative fuel source that should be researched and perfected for the benefit of the environment. Ethanol is a new fuel source and like every single other fuel source on the planet, it has its own set of problems; however, in ethanol's

case the potential for the amount of good it can do for the environment outweighs the risks associated with its production. A regular ethanol refinery itself will produce less than one hundred tons of pollutants per year; this is compared to the average automobile that has the ability to produce 6 tons of pollutants per year. To put it another way, in a single year seventeen cars release more pollutants to the environment than an entire ethanol factory will in one year. While it is true that ethanol has its own problems with the environment, problems from gasoline-powered automobiles are much worse than the negative consequences from ethanol.

Ethanol production can benefit the economy. Many people have no idea where ethanol comes from and often times, they don't care. Unlike petroleum, ethanol is grown and produced inside the United States which offers enormous benefits to the American economy. These benefits include jobs and an expanding market for ethanol production. Dr. Pimentel argues in his analysis that the benefits to farmers are minimal while the benefits to large ethanol companies are large (Pimentel 129). I disagree with Dr. Pimentel on this subject because recent research has shown that ethanol production does benefit farmers. Ethanol production places a high demand on the supply of corn; this means more corn will be needed to produce enough ethanol to fill the demand. Since the supply and demand for corn are both increasing, the market will establish a new equilibrium with a higher price that is more beneficial for producers (Keen, par. 16).

Ethanol production inside the United States affects more than just the farmers who grow corn used for ethanol production; it also affects people who work in the refineries that convert corn into ethanol. With a total of 106 ethanol production facilities inside the United States, this means that ethanol creates jobs within the country. Most ethanol plants tend to be fairly small, employing an average of only 40 people per plant ("Ethanol Information"). By extension, these 106 plants employ over four thousand American workers whose average salary is thirty five thousand dollars a year with full benefits (Keen, par. 5). This means that ethanol production plants are creating jobs in America for American workers, which is good for the economy.

Currently, more ethanol factories are under construction to meet the demand for this new alternative fuel. It is estimated that by the time these ethanol refineries are completed, the production capacity of ethanol in the United States will nearly double (Hahn, par. 1). More plants are needed because as of 2005 ethanol fuel accounted for twelve percent of all gasoline demands (Hahn, par. 3). In addition to the growing market for ethanol fueled cars, President Bush required oil refiners to use four billion gallons of renewable fuel in 2006, and the President has pushed for a goal of seven and a half billion gallons by 2012 to help alleviate the nation's dependence upon foreign oil (Keen, par. 6). To ensure that ethanol fuels produced inside the United States are protected, high tariffs have been placed on ethanol imported into the United States. Clearly it can be seen that ethanol is making progress. The federal government wants ethanol production to be increased inside the United States, which is why it is forcing a market expansion. Not only does it help the farmers who grow corn for ethanol, but it also creates good jobs for Americans. Overall, the production of ethanol inside the United States is beneficial to the American economy.

The last reason why ethanol production should be pursued in the United States is because ethanol is an alternative fuel that offers energy efficiency as well as a stepping stone on the path to finding other alternative fuel sources. In his recent analysis, Dr. Pimentel has harshly criticized ethanol by stating that it has a negative energy output. His analysis states that twenty nine percent more energy is used to produce one gallon of ethanol than the amount of energy that one gallon of ethanol can in turn create (Pimentel 128). I disagree with Dr. Pimentel's view that ethanol has a negative energy output because recent research has shown that ethanol can return a much higher energy output than he gives it credit. Although it is true that the energy output of ethanol is less than that of gasoline, it is still relatively high compared to the amount of energy required to make ethanol. In a 2006 study at the University of Minnesota, researchers found that ethanol can actually yield twenty five percent more energy than the amount of energy it takes to create ethanol (Tilman, par. 1).

The driver of an ethanol powered vehicle may have to make more trips to the pump, because for every one gallon of gasoline consumed, approximately one and a half gallons of ethanol needs to be

consumed to create the same amount of energy (Halperin, par. 9). In terms of energy efficiency ethanol does not produce as much energy as gasoline; however, ethanol can also boost engine performance. Ethanol is sometimes referred to as E85 because it is actually eighty five percent ethanol and fifteen percent gasoline. The benefit of adding this much ethanol to gasoline is that the E85 mixture can boost engine performance because it increases the octane rating of the fuel to one hundred, compared to regular eighty seven octane gasoline (Morris, par. 15). This means that the engine will run much more efficiently off E85 than it will from gasoline.

Ethanol may not be as efficient as gasoline yet, but it is getting there. A recent discovery from ethanol research has shown that a new type of ethanol, cellulosic ethanol, can create more energy and help alleviate the demand for more corn (Tilman, par 1). One of the problems that critics of ethanol have is the amount of corn required to produce this much ethanol will put too many chemicals into the environment. Cellulosic ethanol is created from cornstalks that would have otherwise been thrown away. Cellulosic ethanol has the potential to create more ethanol based fuels without destroying the environment because it is made from waste material. This is a clear example of how ethanol energy research has led to the discovery of more energy from the same amount of corn. Although ethanol is not the perfect fuel, when compared to gasoline ethanol research has shown alternative energy paths whereas gasoline has not.

In short, ethanol is a worthwhile fuel that should be produced by the United States. While it is true that ethanol is far from perfect and that gasoline can produce more energy than ethanol, it is also true that the benefits from ethanol production make it a useful tool in the search for alternative fuels. This is what ethanol is, a temporary alternative fuel source. The simple fact is that ethanol does too much good to be ignored. Of all other sources of alternative fuels that are being tested and discovered, ethanol is the best. I am not saying that ethanol is the answer to our energy prayers, but I am saying that it has shown to be a valuable stepping stone in the search for renewable fuels. Ethanol should be used and produced because it is environmentally friendly, has a positive effect of the economy, and has served as a useful tool in the search for alternative fuels.

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