

Sam wrote this paper as a senior project, in which he offered a complete overhaul of the way we should think about reform and sustainable development. He offers a path that can lead us to independence from fossil fuels, a more uncompromising national security, millions of new jobs in a newly-born industry and a healthier earth and atmosphere for future generations.

### **SUSTAINABILITY: A TEST FOR THE HUMANITY**

The twenty-first century is marked by grave security threats, economic challenges, and serious problems such as the spread of AIDS epidemic and the warming of our global environment. One of these modern problems which pose a serious challenge to our way of life and the future generation's sustainability is our overdependence on limited natural resources. This challenge calls for a complete rethinking of our energy policy in ways that would guarantee the sustainability of the human race for generations to come. This paper offers a direction toward rethinking the American energy policy in ways that would promote sustainability in the most realistic way in the United States and around the world.

Before examining the steps that United States needs to take toward sustainability, it is important to review some of the main reasons behind why we should change our current way.

One of the main reasons why the United States needs to take steps toward advancing sustainability is for the sake of the future generations' living standards. The general consensus among ecologists, geologists and economists is that the sources on which the foundations of economic development have been built in industrialized countries are finite. The dependence of the economy on oil and other fossil fuels has resulted in their rapid depletion. Therefore, if we do not substantially decrease consumption of these resources in the near future, the next generations will not have the means to maintain the living standards we have now, let alone obtaining better living standards.

But there are also several reasons for why our current overdependence on oil is affecting the current generations as well. One reason is the limited amount of oil that exists in the United States. Since economic development in the U.S. relies heavily on this source, we need to heavily rely on oil-exporting countries. This is flawed policy because many of these countries have unstable regimes and are run undemocratically. Relying on such regimes to provide us with natural resources places the United States in a vulnerable economic position, subject to political turmoil in those countries. Even reliance on democratic countries to provide natural resources is not effective policy because it results in our energy policy to dictate our economy and national security rather than our economy and security to determine our energy policy.

Another reason for why the current generation needs to make the transition to more sustainable ways of development is the high petroleum prices. The price of oil is currently around \$70 a barrel. Furthermore, Goldman Sachs predicts that number to rise to \$100 by as early as 2010. The U.S. relies heavily on imported oil to maintain its economy. Last year, petroleum imports alone made up one-third of the entire U.S. deficit. While the macroeconomic effect of such high deficit may not appear in the short-run, high petrol prices do have short-term detrimental microeconomic impact on certain industries. For instance, for every penny increase in the price of oil, the US Airlines loses 180 million dollars. Such burden on businesses results in higher amount of layoffs as well as higher prices, which affects everyone rather than isolated industries. And when it comes to families, they also admit that they feel the impact of high oil prices. Nearly one-third of all the American families surveyed for a study by the Congressional Budget Office claimed that they skipped medical or dental care at least once and one-fourth missed their rent or other housing payments as a direct result of high energy expenses. These numbers demonstrate the impact that high oil prices have on the living standards of current generation.

Finally, high fossil fuel usage has adverse global environmental impacts that affect both the current and future generations. If we look at the ten hottest years ever measured, they have all occurred in the past fourteen years, and the hottest one was 2005. This is an evidence for the fact that the temperature of our planet is on the rise. Most scientists associate global warming to high usage of fossil fuels and high emission of green house gases such as Chlorofluorocarbons (CFCs) and CO<sub>2</sub>. The department of energy predicts that the global demand for oil will increase by 30% by 2020. If consumption of oil increases by the same amount, there will be an equal increase in the amount of CO<sub>2</sub> emission, which will speed up the warming of earth at even a higher rate. In order to interrupt this trend, we need to decrease our usage of fossil fuels by any means necessary.

For the reasons discussed above, all of the countries need to consequently make the transition toward more sustainable methods of development. But in order to spark this global movement, the United States needs to lead the world toward making this transition. The reason why the U.S. is the best candidate is that it is both the oldest democracy in the world, and the largest consumer of fossil fuels. Using its global economic and political dominance in the world, the U.S. can be the largest force in moving other industrialized nations toward sustainability. But this change of policy needs to start in the United States Congress and the White House. Our political representatives need to reassess our energy policy with least influence from lobbyist groups and the oil industry and show the will to relentlessly advance sustainability. By pursuing the right policy, the U.S. politicians can take measure that could decrease the U.S.'s consumption of oil by approximately 50%, or eight million barrels a day, by 2025. The two main components of policy are short-term reliance on other sources of energy to develop more sustainable renewable resources, and conservation in the usage of finite sources.

However, in order to obtain the political will to make this transition, we need to eradicate the misconceptions surrounding the idea of sustainability. One is that sustainability and economic development are *not* opposing values. We can maintain economic development and our current living standards through reliance on substitute sources of energy, eliminating inefficiencies and excess usage of products that do not increase the utility we get out of them by more than the marginal cost of producing those products. We also need to eradicate the belief that we are not capable of making this shift in energy policy from a logistical standpoint. All it takes is a look at many countries that are already moving effectively toward sustainable ways of development. Denmark produces 20% of its power from wind. Brazil produces enough ethanol to power 40% of its cars. Britain shifted its economy toward clean air technology in the beginning of this century, creating thousands of jobs while the GDP rose in five years, and Great Britain has hit its Kyoto target ahead of schedule. These examples demonstrate that what prevents the United States from effectively advancing sustainability is not its inability, but its misconceptions and the lack of political will.

The first component of the policy direction proposed here is a shift toward other and more renewable sources of energy, one of which is bio-diesel and ethanol. Ethanol which can be substituted for a great portion of the oil the United States uses can be obtained from plants such as soybeans, canola, and camellia. We have thousands of farmers that receive subsidies from the U.S. government to grow wheat. But since the amount of wheat that is produced every year ends up being much more than what the U.S. needs for internal consumption as well as exports, the government buys the extra wheat from the farmers in order to keep the prices high and farmers content. The government hopes to use the wheat someday when there is a shortage. But the shortage never comes because subsidies are renewed every year. Therefore, the government winds up dumping the excess wheat on the developing countries through such programs as Food-for-Aid, which results in greatly hurting the farmers in those countries. The reason for taking all these measures is that farmers have a substantial amount of influence on Capitol Hill and put a lot of pressure on politicians to comply. Hence, we must consider ethanol as a real substitute for oil in the short-term, and this policy proposal offers an effective way of doing so later on. If we reap the

benefit of such policy to its highest potential, we can decrease our oil consumption by four million barrels a day by 2025, which would be a 25% decrease in our total consumption of oil.

Another source for ethanol which should be part of the new energy policy is coal. Although coal is non-renewable like oil, it is one that is a smart short-term substitute to oil. To give an example that would demonstrate coal's potential, during the World War II, the German army relied completely on coal to produce jet fuel for all of its planes. The United States has a high amount of coal. According to governor Schweitzer of Montana, if we use our sources of coal in the state of Montana alone to its highest bio-diesel potential, we can substitute the bio-diesel produced from it for oil for the next one hundred years, solving our heavy dependence on oil for a fairly long period of time. If we burn coal the traditional way, it produces high levels of greenhouse gases and CO<sub>2</sub> which can defeat the purpose of using this source as a step toward sustainability. But clean coal technology and geologic sequestration holds the key to solving this problem. Through new emerging technology, we can store the carbon deep within the earth before extracting carbon from the burning coal. This method holds the key to a responsible utilization of coal, but the U.S. government needs to fund a variety of tests in a variety of conditions before fully counting on this source as an effective measure towards sustainable development.

Wind and solar energy are two important sources with high energy potential that can satisfy a substantial portion of our energy needs. The wind potential of just three states – Texas, Kansas and North Dakota – can supply more than half of all the electricity we consume today. Furthermore, technology is bringing down the prices of both wind and solar energy production due to high economies of scale and learning curves involved in the process. The costs for the production of solar and wind energy drops by one-third every time the capacity doubles and that is now happening once every two years. Last year, the amount of power generated from solar increased by 57%.

Finally, nuclear energy must be considered as a possible option for substituting a portion of our oil usage. Last year, nuclear energy provides approximately 20% of America's energy needs while producing virtually no greenhouse gases. However, there are several aspects of nuclear energy that must seriously be considered before we could take the nuclear energy as a real option. One is the nuclear proliferation and security threats. At a time when there are high international nuclear tensions and threats to many countries, we must be conscious of the implications of heightened nuclear activities for energy production. There is also a high amount of waste that is produced through current methods of nuclear energy production that must be studied and their environmental impacts assessed in order to understand the net environmental benefits of this method.

The second part of the shift in the United States' energy policy is conservation. Many politicians do not take conservation as a real step toward energy independence. A few years ago, vice-president Cheney referred to conservation as "a sign of personal virtue" irrelevant to energy policy making. But not only conservation is a virtue, but it is also a part of any sensible energy policy. First, politicians need to resist the idea that kicking the oil habit will hurt our economy. During the previous energy crisis between 1977 and 1985, we almost entirely relied on conservation to solve our lack of sufficient fossil fuels. In that period, the economy grew at a rate of 3% every year while oil usage shrank by 2% annually. Going by that pace in conservation, in three years we can reduce the amount of oil imports by 7%, which is all of the oil we import from the Persian Gulf. What many politicians need to understand is that conservation and efficiency are not about doing less with less; they are about doing *more* with less. Our economy currently is run very inefficiently. 80% of the energy potential of oil is wasted in the internal combustion engines. Furthermore, 50% of coal's energy potential is wasted in traditional utility plants through methods that also cause the emission of dangerously-high levels of carbon dioxide. Through conservation alone and efficiency in both cars and trucks as well as energy usage by individuals and in Americans' homes, we can decrease our oil consumption by another 4 million barrels a day by 2025, which together with higher reliance of ethanol can help us meet our goal of reducing reliance on oil by 50% by 2025.

Having reviewed some of the ways in which we can move closer toward sustainability, it is important to briefly analyze what the government, businesses and individuals need to do to make this shift possible.

Government has the most important step to take toward making this policy a reality, and it must overhaul our tax system as the first system. Basic research shows that our energy tax system is inconsistent with our goal of reducing reliance on fossil fuels. The U.S. gives higher tax breaks to oil companies in their oil exploration ventures than it does to gas stations for installing bio-fuel pumps. It gives higher tax breaks for buying SUVs than for buying hybrids and using clean energy. The government needs to use the energy tax code as effective means of creating incentives that lead to more sustainable behavior. For instance, it needs to create incentives for fleet owners to provide more efficient vehicles, provide tax credits for gas stations to install ethanol pumps and require big oil companies to install such pumps at their stations. Individuals are self-interested. Therefore, the government cannot rely on moral arguments for sustainability as a real method of moving toward energy independence or sustainability. Economic incentives can go a longer way, and the way to create them is through a sensible tax code.

Secondly, the government needs to deal with transportation. 70% of all of oil consumed in the U.S. is used in cars. The government needs to strengthen, expand and make efficient the mass-transit systems at every possible chance. Many auto companies such as GM, Chrysler and BMW are investing in the development of the state-of-the-art hybrid engines. The government needs to encourage such efforts with tax incentives and subsidies for clean air energy research. It needs to provide tax incentives for people to turn in their old inefficient vehicles and switch to hybrid and more efficient cars. Finally, the government needs to address the SUV problem by requiring automakers to build SUVs with similar mileages as sedans. However, this policy needs to be implemented gradually and complemented by government subsidies in order to not hurt the auto industry's competitiveness or Detroit's economy more than it has already suffered in recent years.

In moving toward sustainability, the government needs to overhaul farm subsidization as we know it. There is a way for politicians to stop the current disturbing trends in farming which were reviewed earlier, and simultaneously help the production of ethanol, which could take the place of oil. Through the next five to ten years, the United States needs to shift all subsidies for the extra production of wheat toward production of ethanol-sourced crops. One benefit of such policy is that it prevents the U.S. from producing excessive amounts of wheat which ends up hurting the developing countries. Secondly, it results in a high production of crops such as soybean which could be used toward production of ethanol. Thirdly, this shift in the production of ethanol will create thousands of new high-technology as well as farming jobs which will help boom our economy and even make the implementation of the new immigration bill which is designed to lead immigrants toward citizenship more speedy as most illegal immigrants work on farms than in any other sector. For all these reasons and the fact that we can decrease oil consumption by 25% through ethanol alone, ethanol is an important component of a sustainable energy policy.

Finally, the government needs to cut down its own oil usage and adhere to acceptable environmental standards and protocols. More specifically, it needs to immediately require new federal buildings to comply with green standards and buy the most efficient cars that are available. In addition, through the next ten to fifteen years, the federal government needs to obtain its full electricity needs from wind and solar sources. Birmingham federal building in the state of New York is an example of such buildings, which is the first building to buy 100% of its electricity from wind sources.

In making energy policy, businesses need to be part of the solution not the problem. Businesses can help move the economy toward higher sustainability faster than any other segment in the society. Furthermore, last year, the top six big oil companies made \$113 billion, more than the annual income of 170 countries combined. But they did not make this money because of high managerial expertise or contribution of equal value to the society, but due to a high level of prices

and an increase in the global aggregate demand for a commodity that they did not produce to begin with. But despite such high levels of profits, when Lee Raymond, the chief executive of Exxon Mobil appeared before the U.S. Senate and was asked how much his company had invested in alternative energy over the past decade, he answered, “a negligible amount.” Businesses – and especially the oil companies – should be required to spend a percentage of their resources toward development of alternative fuels. They should have the option of doing so voluntarily, or pay that amount to the government so that it can invest it toward such initiatives. Finally, the government needs to repeal the tax-cuts for the big oil companies which they have admitted they do not even need. The money should be directed toward similar alternative fuel initiatives and the advancement of bio-diesel and clean coal technology. But there are also lots of profits to be made for many businesses in ways that could also promote sustainability. For example, General Electric made over 3.5 billion dollars through sales of wind turbine, a number they expect to rise to five billion dollars. Dow Chemical and members of CleanTech Venture Network are other examples of companies that have realized such potentials for profit-making and in fact are contributing toward more sustainable technologies.

Finally, citizens need to take part in the advancement of sustainability. One of the ways in which they government can help them take part in the new policy is through investment in informational campaigns. Individuals need to be encouraged to purchase efficient products and appliances. For instance, they should be taught that they can greatly decrease their usage of electricity by switching to florescent lighting. They should be encouraged to purchase products with the energy star or other symbols that demonstrate efficiency. They should also be educated about how they can weatherize their homes or fix leaks that result in a higher consumption of energy than needed. Although these steps are very small, their aggregate effect could be substantial in cutting down usage of oil and other fossil fuels.

As discussed, there are many reasons why our current energy policy is not sustainable. Politicians need to recognize this fact. Furthermore, because individuals and families are now feeling the impact of our addiction to oil, policy makers can actually score political gains by offering policies that are both good for the environment and ease the financial burden that Americans feel at the pump. The United States has been over-consuming oil. This has resulted in a situation in which both the environment *and* the economy are hurt because of current policy. While this indicates that we should have started to think about sustainability long before, it is now easier to do so because politicians and elected officials have a much lower price to pay for running for office on environmental and sustainable energy issues than they did over the past decade. Therefore, by following a policy direction similar to the one offered here, we are able to advance sustainability which will inevitably benefit both the future and current generations.