

Introduction

Currently, the world's consumption of energy is unsustainable. Global dependence on fossil fuels precipitates energy insecurity and precipitates climate change. It is in the interest of the United States and the world to reduce consumption of fossil fuels. Here, we introduce three methods by which the world can reduce consumption of fossil fuels: revamping infrastructure, market intervention, and technological innovation. By focusing on these areas, the United States will spearhead the global effort to phase out the use of fossil fuels.

Revamping Infrastructure

The United States federal government should take the lead in promoting energy efficiency to inspire a host of beneficial changes in the practices of state and local governments as well as individual citizens. The Federal government should mandate that all federal buildings should meet certain energy efficiency standards. Existing buildings should be retrofitted for better energy efficiency, and buildings built in the future should be made even more efficient as technology improves. Such programs include use of Energy Star appliances and windows, recycling programs and energy efficient light bulbs. As a partner with the U.S. Green Building Council, new government buildings should meet Leadership in Energy and Environmental Design (LEED) standards. In addition, as the biggest buyer of vehicles in the United States, the federal government should buy more energy efficient cars and buses with electric and natural gas propulsion systems. All government vehicles should be powered with sources other than petroleum by 2020. It should also encourage greener forms of transportation including carpooling, ride sharing schemes, biking, scooters, and public transportation.

In order to create a sustainable future, one of the most important areas on which we must focus is education. To adapt to one of the most monumental challenges currently facing our world, we must invest in education. Increasing common knowledge of climate change and energy efficiency is essential in understanding its environmental effects and reversing our culture of consumption. Environmental awareness and sustainability education should be integrated into current education curriculums, from the primary school level up to higher education. The United States should lead an environmental stewardship, and this process starts at home. In an age when environmental and energy stewardship will be on the cutting edge of technological advances, the United States must cultivate its competitive advantage in developing the solutions to this environmental crisis. Educational programs will do much to change the culture of thinking in this country. As Americans, we are all members of a national consciousness. While we value our individualism, we must work together in this time of global peril to combat the most dangerous threats to the future of our planet.

U.S. highways and central business districts are teeming with congested, pollution-laden traffic. Indeed, the U.S. emits nearly half the world's automotive carbon dioxide . With urbanization expected to increase in the future, we need to lay the groundwork to meet the transportation needs for this

increased population in an environmentally efficient and sustainable way. Public transportation systems should not only meet the demand for them, but should stand out as the most attractive option for new users. They will be safe, clean, and efficient. In cities that already have an existing public transportation system, more resources should be invested to expand its breadth. Lines should connect highly populated urban centers and business districts.

Finally, the federal government must take measures to incentivize sustainability in the agriculture sector. It should implement a Standard Operating Procedure by Americans improve environmental – friendly and sustainable practices of the agricultural industry. The Standard Operating Procedure will include limits to fossil fuel inputs and pesticides inputs, limit fuel inputs to transport agricultural products to markets, and programs to avoid soil erosion and improve soil quality through crop rotation practices. This procedure will be crafted through collaboration among the US Department of Agriculture, the Environmental Protection Agency, and the Department of Energy. These federal agencies will implement a timeline to allow agricultural firms to adapt to these changes. The delinquent agricultural firms who do not make the necessary green improvement in accordance with the new Standard Operating Procedure will be penalized by a reduction in subsidies.

Market Intervention

Climate change is an issue that is swiftly coming to a head. Our liberal society has often depended on the invisible hand of the market in the past. However, by the time the markets adjust themselves to reflect the increasing value of the climate, the climate may already have crossed “the point of no return.” We feel immediate and direct action on the part of the world’s governments is absolutely necessary in solving the climate crisis. The time has passed for the market conditions to fix the energy problems we face today. It is now necessary for the government to intervene to achieve national The following strategies will help adjust current markets to include social and environmental concerns.

Domestic

By implementing a Carbon Cap and Trade, the United States could reduce greenhouse gas emissions. This cap system would gradually reduce the amount of allowed emissions by specifying set maximum ceilings of carbon output. The United States can model their system on the European Carbon market and our own market for nitrogen oxides (NOx). The trade component of the program allows companies with low costs of reducing emissions to earn credits for exceeding emissions standards. These credits can then be sold to companies with higher emission reduction costs. This is the most cost effective way of reducing emissions.

The United States should also expand the state-wide renewable energy portfolios into a national program. States such as Colorado and California have successfully implemented such programs. All local utilities will need to obtain 10% of their energy from renewable sources by 2015. The standard will progressively increase until 2050 until 50% of all electric energy used in the US will be produced from renewable sources. Distributed generation, such as rooftop solar panels, will count towards meeting these portfolio standards.

The federal government should allow utilities to use innovative pricing structures to send clear price signals to consumers and reduce energy consumption. Utilities should be encouraged to explore the possibility of introducing Peak Pricing. This rate structure assigns higher prices for electricity at high demand times of the day. Evidence demonstrates that consumers respond to these price signals by altering behavior and lowering the amount of energy needed at high demand times. Utilities may also explore another pricing option called increased block pricing. Consumers pay a low initial price for the first block of energy with each additional block costing more. These types of pricing strategies should be combined with public education about convenient ways to reduce personal energy consumption.

In this time of economic crisis, the US will be making many changes to the financial sector. The federal government should take this opportunity to incorporate environmental ideals into the financial sector. The government should include environmental stipulations in their new lending practices. By encouraging banks to make green loans to small businesses, it will encourage environmentally friendly development and provide the capital to develop a green economy. The US is also faced with the possible bailout of the automotive industry. Any bailout should include environmentally friendly standards.

International

A similar carbon cap and trade system for emissions will also be implemented on an international level. U.S. carbon markets will integrate with European, as well as other world carbon markets. An international organization will provide oversight for the buying and selling of credits between states and industries.

In order to create incentives for states to comply with international environmental regulations, the U.S. can employ its world economic influence. By imposing tariffs, along with other trade sanctions, states will be obliged to abide by environmental regulations agreed upon by the global community. The economic consequences of non-cooperation would be crippling and consequently promote compliance. The U.S. will not necessarily act unilaterally in these economic strategies, but will attempt to organize a multilateral front. Such an effort will be even more damaging to abstaining nations, and therefore, more likely to ensure participation.

As a responsible international stakeholder, the U.S. has an obligation to provide the technology and supplies needed to create eco-friendly energy sources and industry within developing nations. The U.S. government should be willing to share new federally-funded green technologies as well as provide green loans to these nations to enhance the success of their development.

The U.S. government should be encouraging private investment in not only the research and development of new environmentally sound technologies, but also in spreading the information and production efforts to developing nations. This will provide profits for the investing corporations and create a foundation for sustainable development around the globe.

The fundamental approach to achieving the above mentioned recommendations lies within education. U.S. diplomats will lead the education efforts by beginning with enlightening other nation's government officials. Historically, government leaders are reluctant to pursue environmental goals in

fear of disrupting current development. However, environmentally sustainable growth can be attained without damaging effects on their domestic economy. In fact, these reforms could augment economic prosperity. This informative relationship should not be one-sided, rather symbiotic, where each country learns from one another.

Foundation for Innovation:

It is imperative to develop more innovative technologies and solutions to solve the energy and environmental crises. In order to provide for environmental and energy innovation it is necessary to increase funding for both research and development and for education initiatives. The U.S. Department of Energy will be primarily responsible for initiating the distribution of this funding, which will be awarded to the public and private sector institutions that present the most competitive and efficient proposals to address these problems.

In addition to this funding, the U.S. government should increase investment in education at all levels, especially focusing its efforts in the engineering and science fields. This increase in investment should also be paired with a fundamental strengthening of societal interest in these fields. These long-term strategies will be mutually beneficial and will collectively lay the foundation for crafting more effective energy and environmental policies and for driving innovation.

Innovative Goals:

Coal provides 40% of the United States' energy arsenal and it is cheap and relatively easy to extract. For these reasons, it is impossible to completely cease coal usage, but mitigating coal's environmental impact is essential. Using coal in an eco-friendly way will greatly reduce the United States's and the world's greenhouse gas emissions. Therefore, investment in carbon capture and sequestration technology remains crucial.

Secondly, but equally as important to develop, are more cost-effective and efficient renewable energy sources. The most promising alternative energy sources include nuclear, geothermal and solar (although other types should not be excluded), and therefore the U.S. government should heavily invest in them. Nuclear power has the potential to not only significantly reduce carbon dioxide emissions but also to produce incredibly high energy returns. Considering the successful re-processing efforts that the French and the Japanese have already undertaken, the U.S. should strive to emulate and improve these methods in order to expedite the nuclear development process. However, plant security and waste disposal are potentially serious problems associated with such development, and should be carefully considered while developing this important resource.

Geothermal development is also crucial to achieve energy security and to lessen environmental destruction involved with energy extraction. Successful geothermal utilization requires an one-time considerable monetary investment but its efficiency will eventually pay for itself. Furthermore,

geothermal energy produces zero greenhouse gas emissions and is easily transferable across regions, making its development an optimal use of energy and environmental funds.

Solar power is also a viable, clean and readily available energy source that should be studied and developed further. This type of energy is carbon-free, renewable, decentralized and cost-effective. The use of solar panels domestically and internationally has proven to be an important investment due to its high energy yield and its potential for scalability and transferability is high.

International Cooperation:

These largely domestic ideas and sources of funding should be adapted to an international environment so that all countries and citizens can both contribute to energy and environmental solutions and can enjoy the benefits created by such programs. At the 2009 Copenhagen Climate Conference, the U.S. should promote the establishment of joint ventures between state governments to develop sustainable development and conservation technologies and initiatives and reap their benefits. These bilateral agreements are concentrated enough so as to encourage intensive research and production programs and comprehensive enough in scope to potentially ameliorate numerous energy and environmental concerns. Utilizing joint ventures would acknowledge the universality of these issues by lessening the free-rider problem, and the cooperation fostered between states would create the foundation for expanded and more substantive economic, political and social relationships in the future. Such ventures will also promote goodwill among developing nations, particularly US allies, grappling with the energy problem.

Climate change and energy security are unarguably the most important issues facing our global society. With the United States taking the lead in promoting the changes we stipulated, the challenges of energy security and climate change can be met and overcome.