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SCHOLARSHIP PROGRAM

FIRST PLACE ENTRY
2007

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Dear Sir or Madam,

I have come to understand that the coal industry is a critical part of Eastern Kentucky. It plays a large role in our everyday lives and in our economy. I have also learned that coal is a valuable asset that can, and should, be a clean energy source.

I decided to write my essay in the form of a speech about the positive steps the coal industry has taken to make the use of its product much cleaner. I am an environmentalist at heart, and before doing this research, I don't think I realized that coal can be used safely and efficiently. My audience is community members and U.S. citizens that have those same negative opinions about coal.

I chose the form of a speech because I feel the people in Eastern Kentucky need to step up and encourage their legislators to invest in clean coal technologies. I begin my speech by discussing the effects of 9/11 on the United States, and then I explain technologies that will enable coal to become an even more important part of our future. My conclusion is a call to action that reminds my listeners that the United States must find ways to become an energy independent nation, and encourages them to consider coal as a vital element in achieving that independence.

In doing my research, I have learned many new facts about the clean coal technologies that are available. I also have a new understanding of the importance of clean coal in my community, my nation, and the world as a whole.

I was motivated to enter this contest because I someday want to bring something back to my community – a community that is very dependent on the success of the coal industry. I am a student who has had to overcome many things in life. I was diagnosed with Reflex Sympathetic Dystrophy in 2001, and if it weren't for the coal miners and other workers who make their livings from the coal industry it would have been impossible for my mother, who is an independent business woman, to afford the price of taking me to the doctors who finally helped me. This scholarship would help me with the financial strain of the medical bills and my college costs, and I feel Eastern Kentucky would eventually benefit from this investment because I plan to return here as a professional.

CEDAR is a fantastic program that I am thankful we have. It enables students to learn about how the coal industry has affected virtually everything in our lives today. I thank you for this and for the opportunity to apply for such a meaningful scholarship.

Thank you,

Lucinda Lynn Belcher-Owens

Lucinda Lynn Belcher-Owens

Clean Coal Technology

By:

Lucinda Lynn Belcher-Owens

Cedar Scholarship Program

East Ridge High School

28 February 2007

Since 9/11 the most serious issue facing the United States has been the threat of terrorism. And one of the major reasons for this new fear is our country's dependence on natural resources from foreign nations. Our escalating need for fossil fuels, such as oil, has weakened our country's status in the global arena. Ironically, because of its geographical diversity, the United States possesses a wealth of natural resources within its own borders. Why, then, is our country being forced into submission by forces thousands of miles away? The answer is simple. Our government has not taken steps to enable the US to take full advantage of the resources available right here at home.

One of the most abundant natural resources in the U.S. is coal. According to an article by Discover Magazine contributor, Tim Folger, the US has 27 percent of all known coal reserves and enough to burn for the next 180 years at the current rate of use. Folger further notes, that this makes the US the "Saudi Arabia of coal." (2) Ironically, in Pike County, we see this "black gold" everywhere, yet our local economy still suffers from massive unemployment and a lack of industry. Part of that is because this resource is not being used to its full potential. Since 1955, South Africa has been using coal to produce thousands of barrels of gasoline and diesel (Montana). In Florida, a coal fired power plant produces 250 million watts of electricity, yet produces no smoke. And in North Dakota, a coal fired plant is used to make natural gas, while the CO₂ produced in the process is piped to oil fields in Canada. If our government would commit to the development of these clean coal technologies, the US would be able to produce fuel from a supply that is abundant in our own country. In addition, because the supply of coal is much larger than our demand, this research would give us an energy source that fluctuates little in price, does minimal harm to the environment, and gives the consumer

maximum benefits. In other words, using technology to convert coal would give this nation a stable energy source that would virtually free us from dependence on foreign markets – and help us regain our status as a true world power.

Most consumers believe coal is a dirty mineral. They think coal cannot be used as clean energy, ignoring the fact that the coal industry has spent billions of dollars developing clean coal technologies. This research has focused on finding ways to transform coal into energy without the damage inflicted by carbon emissions during the burning process. One of those new coal technologies focuses on using coal to make hydrogen from water and then burying the carbon dioxide and burning the hydrogen. According to the US Department of Energy, the goal of their hydrogen program is for hydrogen to produce ten percent of our country's energy by 2030 (Energy Information Admin). Clean coal technology will play a vital role in helping reach that goal. Currently, the process of steam reforming is the least expensive method of producing hydrogen, but there is no doubt this results in greenhouse emissions that increase global warming and threaten the environment. However, carbon capture and storage could mitigate the effect of emissions. Shell Oil is currently funding a project in Norway that will take the CO₂ from a coal powered plant and “inject it into the Draugen and Heidrun oil reservoirs to push out further supplies of oil, leaving the CO₂ safe under the seabed.” (MacAlister) This type of innovation could make steam refining more environmentally safe and a cheap, effective fuel more readily available for use in hydrogen cells.

The need for electricity will never abate, and the simple fact is that using coal burning plants offer the most economical, feasible of producing electrical power. While older power plants around the world are major contributors to greenhouse gases, this, too,

is a problem with a solution. According to the World Coal Institute, “Electrostatic precipitators and fabric filters can remove 99% of the fly ashes from the flue gases” (“Particulate”). The electrostatic filters are already being successfully used in the production of electricity. The Lethabo Power Station in South Africa uses filters to remove 99.8% of the ash in its emissions. Closer to home, the Polk Power Plant near Tampa, Florida, captures all its fly ash, 90 percent of its sulfur, and nearly all of its nitrous oxide by using filters. Still more interesting is that Tampa Electric then sells the by-products of its coal burning facility to make even more money. Sulfur, for example, goes to the fertilizer industry; the slag to the cement industry; and waste water to a gasifier. (Folger, 2) It seems logical to assume that this type of plant would represent the future of energy production, especially since the Department of Energy estimates that current overall energy efficiency is only 45% and that “transportation and power generation have the greatest opportunity for improvement.” (1) Yet, of only 75 coal fired plants slated for construction around the world over the next decade, only nine will use clean coal technologies – probably because such plants costs about \$1 billion. (Folger, 2) Obviously, taking advantage of coal’s potential will require a great investment from both government and industry, but the technology is there if we can convince our leaders to pursue its use.

When we talk about billions of dollars, the future of clean coal seems rather dim. However, there is reason for optimism. In his 2007 State of the Union Address, President Bush expressed his desire – and the country’s urgent need -- to improve clean coal technologies:

“Extending hope and opportunity depends on a stable supply of energy that keeps America’s economy running and America’s environment clean. For too long our nation

has been dependent on foreign oil. And this dependence leaves us more vulnerable to hostile regimes, and to terrorists – who could cause huge disruptions of oil shipments... and raise the price of oil... and do great harm to our economy. It is in our vital interest to diversify America’s energy supply – and the way forward is through technology. We must continue changing the way America generates electric power – by even greater use of clean coal technology.” (Bush)

As further evidence of his commitment Bush has now proposed spending \$385 million to fund clean coal based power generation plants (Bush Slashes).

Kentucky produces about 160 million tons of coal each year. Coal mining is essential not only to those employed locally by the industry, but to the economy of our state as a whole. In Kentucky, coal actually makes our cost of living one of the most reasonable in the nation. As a matter of fact, the average electricity cost for most Kentuckians is the lowest in the nation. But we also pay a hidden price for our savings. If projections are correct, the addition of coal plants around the world could add enough CO₂ to the atmosphere to make the average global temperature rise up to 10 degrees Fahrenheit by 2100. (Folger, 3) This means federal and state governments would be wise to further invest in clean coal technologies and provide incentives for building plants that incorporate carbon controls. A 2006 Senate resolution was a step in that direction because it encouraged a “cap and trade” approach, which requires polluters to buy permits that control the amount emission. The theory is that companies would buy and sell these permits based on the cost of reducing emissions. According to *Catalyst*, a publication of the Union of Concerned Scientists, cap and trade “creates a financial incentive for emission reductions by assigning a cost to polluting.” (1)

As Kentuckians, we should encourage our legislators to pursue creative alternatives for reducing emissions in order to promote the use of coal. And it would be wise to remember that every dollar we spend in this pursuit will have advantages for both

our state and the rest of the world. The coal industry provided approximately 15,552 jobs to miners in Kentucky in 2005. It is estimated that 15,012 of those employees made an average of \$51,000 (Kentucky Coal Education). But beyond this, consider that 73% of Kentucky's coal is exported to twenty-three different states and four foreign countries giving them the ability to produce electricity and manufacture products. Transporting this coal creates thousands more jobs for railroad workers, truck drivers, and shipmen all around the world. According to the Kentucky Coal Education website, coal brings in revenues of approximately \$2.8 billion, and for every dollar spent on coal, 85 cents goes back into the community in forms of personal expenses, wages, and benefits. (1) It's a recursive process where everyone seemingly profits. Realistically, however, we all must realize that this cycle will eventually result in a major loss – the health of our environment if we do not act now.

On 9/11 we came together as a nation. We were appalled at the damage inflicted on our country, and we were motivated to find solutions to the problems that precipitated this catastrophe. Now it's time for us to realize that the answer lies within ourselves. We must encourage our government, our industries, and our citizens to take advantage of the valuable resources we have here at home to fulfill our energy needs. But we must also do everything we can to preserve our environment; in the past, these two objectives were in opposition. That is no longer true. Clean coal technology is the future – and it is now. We simply need to act quickly and decisively to make sure it is a major part of the solution to our complicated energy challenge. Our lifestyles, our communities, and our futures demand that all Americans, especially Eastern Kentuckians, become advocates for clean coal technologies.

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