Investigative Inquiry into the Coming Energy Crisis and Alternative Energy Sources

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June 29, 2006
UIS ENG 102 spring assignment (modified)

Synopsis

This is a slightly revised article originally written for an English Composition course while I attended the University of Illinois at Springfield (UIS). The point of the exercise was to cover an area of civics through a research-based inquiry essay of interest to the students enrolled in the class. The content of the manuscript itself deals with a somewhat taboo environmental topic whom fear mongers often refer to as the Energy Crisis. The inquiry involved asking if there even existed a potential for an energy crisis in the near future based on current scientific research and if there was what could be done to curve it. The overall discussions suggest that if there were to be an electrical (power provider based) energy crisis it would likely not occur for another century, however there does exist a strong possibility for a world wide fossil fuel (petroleum based) energy crisis within a decade. A brief discussion regarding current world wide consumption of power (largely based on U.S. statistics) and the availabilities of alternative power sources strongly suggest that any near term energy crisis would introduce cascading effects into our global society reverting it back to preindustrial levels of development.

Introduction

There have been quite a number of alarmist in recent years warning of an impeding energy crisis of epic proportions. Then there are those across the other side of the aisle who claim that there will be no foreseeable energy crisis at any time in the near or distant future. A shining example of what an energy crisis would entail in the popular consciousness was the roaming and costly power black outs experienced by the state of California during 2001, which has consequently acted to boldly underscore the possible and perhaps very likely reality of a looming energy crisis in the not too distant future. Simultaneously it is also possible scratch off a potential energy crisis with the recent media revelations of the *Enron* energy management fiasco and fraudulent book cooking schemes which have become known to the public. The perception caused by the magnitude of *Enron's* corrupt power management schemes has also caused a great many to reasonably attribute the energy crisis experienced by California in 2001 to a deviant act orchestrated by powerful few rather actually representing a physical energy supply problem. The prevalent question that still remains however is, does there exist a potential for an energy crisis in the near future, or is the whole of the debate simply centered around fear mongering?

One would reason that finding an answer to the energy crisis debate would be a rather straightforward process and could be easily accomplished by simply searching through publicly available government documents. The reality of the situation however is far more cloudy than what one would naively assume. In fact the only worthwhile government statistics that I can happily recommend at this time to the serious researcher is the data provided by the EIA (Energy Information Administration) although it would take a skilled mathematician to make sense of much of the data. In the course of my research I found that the topic of energy production and its reliability across the United States is clouded in a thick fog of contradictory information created by a variety of sources often designed to come to a predetermined conclusion. I found this

forging of conclusions to be rather disappointing during the course of my research as my goal was simple when I started. My starting goal was simply to find energy trends and projections from seemingly reputable sources and simply report those facts. In the end I found that I was forced into doing quite a bit of investigative research to dig through the many misconceptions, wishful thinking, and outright disinformation put out on the problems and demands of energy production throughout the U.S. The general consensuses from my present research suggest that there is no foreseeable Energy Crisis at least for electrical power generation in the near future. The downside however is that present methods of producing electric power and mechanical-based transportation seem to bring an irreversible trend with them. Those trends could unfortunately bring about an impending Environmental Crisis at least in the context of Global Warming which unfortunately has no present global alternatives to prevent. Another note of concern is that due to global transportation needs the world will soon be facing an Oil Crisis that will inevitably cause a disastrous world wide economic disaster, and that's assuming that it is not all ready underway albeit slowly. I admittedly know that it is highly non traditional to begin a research paper with the conclusion first but I felt it necessary due to the flippant misrepresentations of data that I came across in my general research. Of the three issues mentioned up to this point Power Production, Environmental Hazards, and the Oil Transportation Crisis I only consider the later to be of immediate present concern in order to carry on the daily life styles which the industrial world has become accustomed. While the other two issues are highly hyped in the mainstream media, rightly or wrongly they are only secondary considerations in terms of their economic impact on most of society.

While environmental issues such as Global Warming are certainly of concern, our past activities have taken as down a road which we find no present exit. At best experts tell us that even if all global pollutant emissions were halted immediately we would still be stuck with long lingering after effects caused by damage already done, so it would seem rather pointless at this time to cry over this split milk. While I hate to admit it, I do foresee roaming black outs like those experienced by California becoming a part of our not too distant future, but if more plants were built and methods of conservation imposed such problems could be resolved through a willing spirit. The real problem at the moment is that the world relies too heavily on oil for its transportation needs and that resource is very limited and demand for it is ever rising.

Now try to imagine a not too distant world where half a nation's Gross Domestic Product (GDP) is spent purely on transportation cost, such a world would easily kill off outside economic trade and industry resulting in the death of the modern world as we know it. And I do not know how to define an Energy Crisis any better than by throwing the world back into the preindustrial revolution, all in all dwarfing the California Energy Crisis, the popular worst case scenario in many people's minds. With oil as the top dog as the world's transportation provider the GDP disaster that I just conjured up is not a matter of if it will ever happen but simply a matter of when it will occur. With current global energy trends the unknown date for the impending Oil Crisis in all likelihood may come sooner than we all might suspect, demanding action to prevent it now and not later. The purpose of the remanding portion of this paper is simply to support the positions I have just outlined and to explain how those three main conclusions of my investigative inquiry were reached.

A World Without Power

How would society change without modern technology and the power sources which run the devices on which we have come to rely on? We do not have to think too hard due to cataclysmic devastation caused by Hurricane Katrina and by the South Asian Tsunami. Admiral Thad Allen who took over Federal Emergency Management Agency (FEMA) during the Michael ["Brownie"] Brown fiasco relayed that many hazards could have been over come if cities had independent rather than centralized infrastructures to be used as emergency back ups. The world is quite aware that all of the industrial civilizations have not come to view technology and power as a luxury but a basic means to acquire the most essential of life's goods. We know that the lack of basic needs can bring down even the mightiest of empires as seen through the bitter experience of history, the chief example being the collapse of Rome after the destruction of its aqueduct system. A world without power is a world that unleashes catastrophe after catastrophe as moving from one disaster to another would set up a fall of a dizzying pattern of dominos. Extinct would go the way of modern medicine, education, the availability of tools and the food supply required to support large populations of people. We have only seen snippets and pieces of a world without power and neither are very welcoming glimpses into the future, and this is the picture which is to be painted when one bothers someone with the gloom and doom of a realistic energy crisis. Clearly it is an outcome to be avoided if at all humanly possible that is assuming that any chain of events could lead to a devastating global energy crisis resulting in the utter destruction of modern civilization.

Environmental Concerns

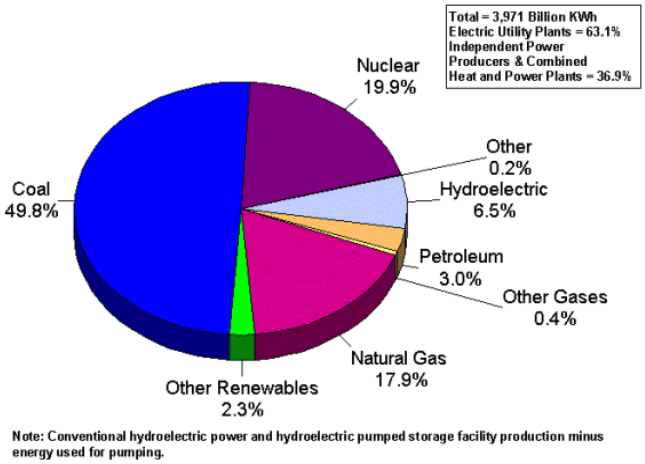
When one hears of an impeding Energy Crisis, they typically recall the doom and gloom claims of popularly known organizations such as *Greenpeace*. While the folks at *Greenpeace* are in general well-meaning people, they have little understanding of the so-called Energy Crisis as they are more focused on the environmental impact of modern technology than anything else. One of the chief goals of *Greenpeace* is to reduce world wide global emission standards to 1990 levels by 2020 in order to avoid permanent global climate change (Greenpeace 2006). Now there is good reason for the concerns of *Green peace* as it is widely held the world is stuck at the level of damage done by the 2% increase in emissions from the preindustrial era which includes at the very least a partial rise in the world wide sea level. However anything beyond the 3% emission level would result in permanent and irreversible climate change whose direct consequences are not yet fully understood. For decades we have been told that we will be facing an environmental crisis as well as an energy crisis in the not too distant future, but is there any truth to the hype?

A recent news release by the British Broadcast Corporation (BBC) has described the current trend in global warming has become irreversible by study of arctic ice sheets. On Sunday, March 19, 2006 the program *60 Minutes* on the Columbia Broadcast System (CBS) interviewed a NASA climate researcher James Hansen whom confirmed without a doubt that man made pollutants have been responsible for accelerating the rate of global warming beyond the natural rates seen from ice core samples (Pelly, 2006 (CBS)). Hansen goes beyond the concerns of Global Warming when in his interview he states that the White House has been responsible for editing the content of his work and that of others to change its very meaning. Hansen's concern of the government "rewriting the science" is sadly not too surprising from my experience in the course of my research for this paper alone. Now that we have cleared up one

misconception and unearthed a taste of edited scientific data we now press on forward to issues on energy.

Power Plants

The popular shining example of an energy crisis would be the failure of Energy Utilities to provide consumers with electrical energy (e.g. Riley 2000). The current energy consumption trends in the U.S. can be nicely summed up with the pie chart below and to the right [Pie Chart Comes from the EIA-906, Power Plant Report]. The three big sources of consumed power throughout the U.S. are Coal, Nuclear, and Natural Gas. Two of three sources of power in the U.S. are nonrenewable fossil fuels, with coal having a presently estimated 200 year supply (Riley 2000), and in itself is considered to be a rather wasteful energy source (D.O.E. 1978). Natural Gas is known to be a limited resource but the known supply of this source of energy is largely unknown, although it does consume a large portion of residential power use (U.S. Government Printing Office 1989). At this point it should be perhaps pointed out that the *Greenpeace* organization would like to see a 10% gain in renewable energy by 2020 in order to stalemate current global climate change predictions. In the real world however the desires of the *Greenpeace* organization seem entirely unobtainable, for example the past year has shown a 1% growth in renewable energy sources which is entirely dwarfed by the raise in consumption of conventional fossil fuels during the same period (Caruso, 2006). And since there is also an ever rising trend in Coal and Nuclear energy production there is little reason to fear an impeding electrical Energy Crisis at this time. Although it is likely that when coal dries up so will natural gas and clearly Nuclear Energy alone will be incapable of sustaining society as a whole and is something our prosperity should be acutely concerned with, but again it is not an immediate energy concern. What is of present concern however is that a bulk of the U.S. energy market is spent on transporting the energy to the consumer and the consumer using fossil fuels such as petroleum for their own transportation needs (Caruso, 2006). This brings us to our next topic, the impact of oil on our society and how it seems to usher in new unexpected changes to it based upon its wide usage.



Big Oil

Oil is the big elephant in the room and it's about time to discuss that wild card, a nice introduction to the topic was a goal from the 1989 U.S. National Energy Strategy Report:

> *...achieving balance among our increasing need for energy at reasonable prices, our commitment to a safer, healthier environment, our determination to maintain an economy second to none and our goal to reduce dependence by ourselves and our friends and allies on potentially unreliable energy suppliers*. – U.S. President George H.W. Bush

The opening words of the Energy Strategy are a bit unnerving as it seems to foreshadow events which now have come to pass. One of the prevalent buzz terms that are around today due in part to so called "unreliable energy suppliers" is the outcry for *hydrogen fuel cells* to replace current fossil fuels used by automotive vehicles today, yet it is far from a new technology (D.O.E. 1978). In fact what is little known to the general public is that hydrogen fuel cells require coal and petroleum sources in order to obtain the hydrogen they would use (D.O.E. 1978), perhaps explaining any really true interest in this technology. After all why spend any money on a fuel source that is more costly to use than current fossil fuels and at the same time would leave a larger impact on the environment? But it would seem that the government has been quite aware of the supply problem of crude oil and its use as an energy source for quite sometime and has simply been unwilling to be forthcoming about it to the general public. As an example it is rather astounding at the stark differences between the oil production projections alluded to in the 1989 National Energy Strategy compared to the actual data at the time as reported by the Energy Information Administration (Caruso 2006). It is generally widely known that U.S. oil production peaked in 1970 and has been decreasing ever since. So the faulty projections beyond the 50% margin found within in the 1989 National Energy Strategy Report are certainly alarming, as it appears as there were parties in the past who were deliberately altering data to give a false impression of projected oil securities. Oil in this regard is quite the wild card as most of the data on it aside from reported usage are suspect and require substantial back tracking to check the authenticity of the data. There is a reason of course of as to why the government would be so concerned about oil and oil suppliers while at the same time being a little less forthcoming than they should be about it, but perhaps this is a point is best pondered by the reader.

Further Encounters of Deception

There are three main points from President George W. Bush's National Energy Policy. First the policy outright acknowledged that U.S. Energy Consumption has far out paced the ability of the nation to produce energy, and then exaggerated the actual circumstances quite a bit. A direct quotation from that sediment in the 2001 report reads: "America in the year 2001 faces the most serious energy shortage since the oil embargoes of the 1970s". The second point is that the 2001 National Energy Policy projects an energy needs which is almost directly proportional to foreign production of oil, which is interesting as it contradicts the position of the first Bush White House. Even more alarming is that the National Energy Policy projections differ from that provided by the Energy Information Administration, talk about the other hand not knowing what the other is doing! This has prompted others to suggest that the so-called Energy Crisis itself was a fiction designed to reign in profit, as seen from a 2001 USA Today article:

> "*There was never an energy crisis, and the Bush people were hyping it up to get their supply and production initiatives through," says Bill Richardson, Energy secretary for President Clinton.*

But this is perhaps not an entirely as clear cut as it seems quoting a 2003 report by Williams and Alhajji:

> *By every measure of petroleum security or vulnerability that we have examined, the United States is as vulnerable, and in most cases more so, than at the time of the 1973 Embargo.*

From all the backs and forth on oil supply status from all these sources over all these years tend to suggest that there is at the least a deep-seated concern regarding a potential Energy Crisis in the near future. While the consensus on the Energy Crisis differs there has been some recent support that it is a valid concern after the second largest oil reserved of Cnatarell located in Mexico has already passed its peak production and is presently in decline (Shaw 2006). And the last point addressed by the U.S. 2001 National Energy Policy was oddly enough the environment. Strangely enough, the report threw in a number of scenic photographs, perhaps as attempt to make the report seemingly much greener than its written content entails. The green nature of the policy was rather odd following the stark oil projections given for the nation's reliance on foreign oil. The only purpose of the green policy it seems is to give the reader a false impression of the administration following previous environmental regulations as well as to induce domestic oil production.

Although big oil is a rather large distraction from the truth behind the Energy Crisis and may be a big target it is far from the only source which muddies the water of the Energy Crisis. There are also a number of false claims regarding the aspect of conventional utility power generation, for example *culturalchange.org* takes a hostile position on the media portrayal of nuclear energy. The position of *cultrualchange.org* however is completely unfounded in terms of concrete science, and has been manipulated to support their belief that nuclear energy is an environmentally safe alternative to fossil fuel use. This position is almost forgivable and not altogether surprising when seemingly reinforced by the seemingly "green" aspects of the official 2001 National Energy Policy which advocates broadening the use of nuclear power. At other times seemingly reputable scientists can make highly controversial claims. An example of this was a scientist who skewed the history of nuclear energy in order to help support a personal pet project (Seitz 1990) that just happen to contradict historical fact on the subject. And this discussion only represents a taste of the deception out there that you the reader has become indoctrinated through the brief survey of material covered in this manuscript. Underscoring that the wishful thinking, miscommunication, and the outright attempts at disinformation outlined at the very introduction of this paper were far from over exaggerated.

<u>Outlook</u>

I would like to end this investigation by a summary of what has been gained through the inquiry process when it comes to the Energy Crisis. In short there is a lot of miss use of information with the subject matter in general, both intentional and unintentional which virtually makes the uncovering of the whole topic practically incomprehensible for the digestion of the general public. My goal at the unsought was simply to find some government reports on energy production needs, energy sources and where the energy needs are projected into the future. In those regards I was fortunate and found plenty of data from the Energy Information

Administration, the problem is that you need to be or know a statistician to truly make use of the information. However there was next to nil information about where the energy sources come from and how much fossil energy is really out there, making it very hard to establish a time line for an impending future Energy Crisis which was the original purpose behind this article of inquiry. A second goal was to inquire if there was an Energy Crisis what other avenues of alternative power generation could be pursued to curtail such a crisis. Perhaps one of the most clear cuts answers in this inquiry was that even if alternative energy sources such as wind, solar, geothermal were to be employed on a wide scale consumer demand for power would overwhelm these alternative energy sources. The grim outlook is that if we were to face an Energy Crisis in the near future there are no current solutions to resolve such a crisis. Overall the two main activities which modern fossil energies find themselves being used for are the heating of residential and commercial buildings but most dominantly meeting the transportation needs of society. As society grows so does the world wide the demand for these fossil fuels that are in finite supply which inevitably leads to an economic crisis situation. With petroleum prices increasingly soaring, industrial development continually expanding and a projected need for 68% imported crude oil supply by 2020 in the U.S. alone (Caruso 2006). The whole world may very well be facing a grim global Energy Crisis within a decade due to its addiction to oil for its transportation needs.

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