Alternative Energy: Resources from Coal to Wind

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ALTERNATIVE ENERGY RESOURCES

By Gary L. Parsons

In the past few years, we have been constantly barraged with new of rising energy prices and extreme instability in the areas where our energy is located. You have to be asking your self: is there a better way? This article hopes to show that there is. The web is full of sites on energy, from the basics to the ultra fantastic. For each energy source, I have tried to find one site that is a good, solid representation of that type of energy. My bias (or perhaps emphasis), whenever it appears is in regards to an energy sources' usefulness in transportation. I hope that this work will be both informative and entertaining. Enjoy the ride.

THE BASICS

- **Oil.** Whatever else can be said abut oil: it works. It powers a multitude of engines and is useful in all types of situations. The problem is supply – and not just pure supply (some now think that petroleum is a natural geological phenomenon), but supply outside of politically unstable regions. A good site for its discovery, etc is *How Oil Drilling Works* (http://www.howstuffworks.com/oil-drilling1.htm) part of the *How-Stuff-Works* sites (excellent for basic information on anything technical). This site gives us the basics of the oil business from exploration to extraction.

- **Coal.** Coal is quite abundant. We have at least as much as the Saudi's have oil. **A** *United Mine Workers* site (http://www.umwa.org/mining/colminrs.shtml) illustrates the various types of mines and how coal is extracted. A site from the *World Coal Institute* (http://www.wci-coal.com/web/bl_content.php?menu_id=0.0) discusses coal's role in future energy use.

- **Nuclear.** Nuclear works. We find that if we approach this source without the usual irrationality that nuclear is a viable and economically competitive **a**lternative to coal and oil for large scale power generation. The folks at *How Stuff Works* (http://people.howstuffworks.com/nuclear-power.htm) have good, basic explanations and diagrams of how one a nuclear power plant works.

- **Natural Gas.** Natural gas (http://www.naturalgas.org/) is a clean burning alternative fossil fuel that we have in abundance in North America. It has many uses, including that of powering cars and other vehicles as this site http://www.ngvc.org/ngv/ngvc.nsf) from the *Natural Gas Vehicle Association* shows us. Natural gas is already in wide use in fleet cars, buses and other vehicles that do not stray too far from the fuel source.

- **Internal Combustion Engine.** Like its petroleum counterpart, this bit of technology has served us well over the past century (and beyond). It comes in all sizes and serves countless types of vehicles and power needs. The *How Stuff Works* series has a good site (http://auto.howstuffworks.com/engine3.htm) about just how your car engine functions.

- **Heavy Oil.** Heavy Oil is not the liquid were used to. It is petroleum in a much more solid form. It looks like silly putty with coffee grounds**.** Indians used to calk their canoes with it**.** Nevertheless, there is as much of it available in the balmy climates of northern Alberta as the Saudi's have crude. With energy prices high, heavy oil remains economically feasible to use it (http://www.lloydminsterheavyoil.com/whatislaunch.htm). There is also lots of oil within many shale fields. Shale is, like heavy oil, abundant but harder to get. Still, they both remain interesting possibilities.

- **Diesel.** Diesel oil is slightly less refined that gasoline. It is always "oily" And not "liquidy" like gasoline**.** This slight lack of refinement gives us more bang for our buck – or at least our barrel. Long the property of heavy equipment , industrial use and railroads, technological advancements make it viable for automobiles – even small ones. Advocates state that the same level of diesel on our roads as in Europe would save us the amount we import from the Saudis. A good example of how these engines work is, again at, "How Stuff Works" (http://auto.howstuffworks.com/diesel1.htm).

- **Coalgas.** One solution to the fuel problem is to just make our own. One result or desire to make our own is Coalgas (http://www.visionengineer.com/mech/coal_gas.shtml). Coalgas is a "synfuel" (synthetic fuel) made from mostly coal. This is not a new technology. The Germans ran there war machine on it with only the technology of the 1940's. Think what we could do today.

ENERGY TRANISTION TECHNOLOGY

These are the alternative energy sources that are already ready for use or in serious development – with just a little push to get the to the magical status of "commercially reliable".

- **Hydrogen**. If the United States is running out of a fuel source, why not switch to the most abundant element in the universe? We can, however there is a problem. You can't just drill or mine hydrogen. You can physically touch a pool of oil or a lump of coal. Hydrogen does not exist in such a form . You have to create it. It is usually used as a natural gas and storage is a problem for the liquid form vehicles requires (high pressure, extreme cold temperatures) . These are basically infrastructure problems. Hydrogen already powers vehicles that don't venture from their sources (buses, urban fleets). What happens between cities? The

infrastructure issues are solvable and many companies and/or inventors claim that they already have. Foremost among these folks is Roger Billings (**http://www.hydrogennow.org/HNews/PressReleases/Billings/Billings1.htm**) who claims to have solved the fuel cell problem in the 1970's and now can easily convert internal combustion engines to fuel cell use)

The D.O.*E's Energy Efficiency and Renewable Energy* page (http://www.eere.energy.gov/hydrogenandfuelcells/) discusses the hydrogen economy and how fuel cells work.

Related to hydrogen energy, I must mention a word about **fuel cells** , the most common – at this time - agreed upon method of using hydrogen.. A fuel cell is an electrochemical device _ yes, like a battery - but designed for continuous replenishment of the reactants involved. It creates electricity from an external fuel, while a battery is discarded when drained. A simple but effective illustrated explanation of fuel cells in general is found at the site of the *National Renewable Energy Laboratory* (http://www.nrel.gov/vehiclesandfuels/whatis_fuelcell.html).

- **Alcohol.** Alcohol and driving do mix: in the fuel tank Alcohol is a viable fuel for vehicles. It was, in fact, the original choice of fuel by Henry Ford! Alcohol can be used in an internal combustion engine with little modifications. Many countries have been using for years. It burns cleaner than gasoline but has a little less octane, requiring more of it to "stay even" with the power of gasoline. Nevertheless, it is a renewable fuel and it works. A good essay on the history, pros and cons of alcohol can be found in *Bill Kovarik's Fuel of the Future* essay (http://www.radford.edu/~wkovarik/papers/fuel.html#conclusion).

- **Steam.** Back to the future. Another alternative solution is the original fuel for mechanized vehicles: steam. Steam is an old technology. It was used for toys in the ancient days. There is even a famous picture of a steam car in the 1770's – internal combustion and diesel did not appear until the late 1800's. This car – known as the Cugnot vehicle - was little more than a buckboard with a boiler in front (sadly, the picture shows it being driven into the side of a building) – but it was powered and it ran. Steam cars are safe, easy to maintain and run on a variety of fuels. Details of these advantages are fleshed out for the *Steam Automobile Club's* FAQ page (http://ghlin2.greenhills.net/~apatter/steamfaq.html).

Another good source for steam and alcohol is the page of steam advocate *Mike Brown* (http://www.mikebrownsolutions.com/). It gives good practical advice on steam and other resources and compares gasoline and alcohol fuels. Very informative.

- **Compressed Air.** Want an abundant energy source? How about running our vehicles on air? It has already been done. MDI (Moteur Developpment International) in France (http://www.theaircar.com/howitworks.html) has

come up with a CAT (compressed air technology) vehicle. It runs on tanks of compressed air and can run for 120 miles or up to 10 hours. Its a modern start. The *Pneumatic Options Research Library* (http://aircaraccess.com/index.htm) shows us lots of cars running on air: in the late 1800's!

- **Wind.** From compressed air we move to the least compressed air of all : ordinary wind. While not useful for transportation, wind generators can help relieve stress on the power grid and other forms of stationary power generation. The *National Wind Technology Center* (http://www.nrel.gov/wind/animation.html) has a good page with moving graphics on how wind technology works.

- **Tidal.** Tidal power is just that. It generates power twice a day from the change in the ocean's tides. Tidal power will not, of course, do the Midwest much good, but it can help relive pressure on the grid in the heavily populated Coastal areas. It creates power in a similar fashion as regular hydroelectric power plants (and can use much the same technology and equipment).

The *Darville* website (http://www.darvill.clara.net/altenerg/tidal.htm#adv) gives good details on tidal power's workings, advantages and disadvantages.

As I have just alluded to hydroelectric power, I must mention that the USGS (http://ga.water.usgs.gov/edu/hyhowworks.html) has a nice site that explains how dams and the hydroelectric process works.

- **Biofuels.** It is possible to can make fuels out of plants and plant waste. Two good sites from the *State of Oregon* (http://www.energy.state.or.us/biomass/BiomassHome.htm) and Uncle Sam (The *Department of Energy* has good, solid information on its webpage on alternatives - http://www.ott.doe.gov/biofuels/) gives excellent explanations of how the process works and what is can do for us. Biofuels claim to be the best renewable for liquid fuels that we have right now. Fuels used now are ethanol, methanol (alcohol) and biodiesel.

- **Hemp.** Hemp is an interesting plant that can be use for food, clothing paper – and fuel.

It is grown everywhere in the world – except here. This provides field day for conspiracy writers, but it is probably due to hemp's familial links to the cannabis (marijuana) family. Hemp supporters have a strong web presence. The best one I found that explains its potential as a fuel is the *Castleman* (http://www.fuelandfiber.com/Hemp4NRG/Hemp4NRG.htm_) site.

http://www.artistictreasure.com/learnmorecleanair.html

Stirling. The Stirling is one of a series of devices that is a heat engine that operating on any fuel. This futuristic technology (invented in1816) is in use now but not in widespread

use yet**.** **A** good explanation is at Stirling's own homepage (http://www.bekkoame.ne.jp/~khirata/indexe.htm).

- **Solar.** Let us not forget solar, one of the older of the "new" technologies. Not that useful yet in transportation or industrial use, solar has found a niche in the individual home. Solar is a key factor in cutting utility bills and is the key to the efficient and environmentally sound passive solar homes that we have now. As good a site as any for solar is the *Florida Solar Energy Center* (http://www.fsec.ucf.edu/).

TO BOLDLY GO……..

These are the possibilities for future developments. These items usually exist in experimental and/or "toy" form, but not in workable models – yet.

- **Cold Fusion.** We all remember the hype in1989 when this was announced and the inventors were hounded by the "scientific" press. Well, an intrepid bands of researchers all over the world have kept up with it and guess what: it works. Cold fusion (actually the popular name for LENR-CANR: Low Energy Nuclear Reaction-Chemically Assisted Nuclear Reaction) has an extreme web presence , mostly of aficionados and a few debunkers. The closest to a "how to" site is the *Wikipedia*: **http://en.wikipedia.org/wiki/Cold_fusion .** Mainstream journals are beginning to write about it and our Energy Department is initiating a second look at it. Could we finally realize Jules Verne's dream of fire from water?

- **Free Energy.** Free energy refers to a whole family of devices, mostly magnetic in nature, that provide fuelless propulsion. The muse of this movement (and to a degree the entire alternative energy movement) is 19th century inventor Nikola Tesla. These devices could significantly change society – whenever they get them beyond the laboratory stage. Not without their critics, aficionados of Free Energy have a large web presence. The *Living Web* site (http://www.thelivingweb.net/free_energy.html) has a decent overview of all of this.

JOURNALS

Three journals have caught my eye in the field of energy:.

Extraordinary Technology. (no ISSN available) This journal is from the Tesla Tech group, an outgrowth of the defunct Tesla society. Most articles, therefore, are on energy development with a pro-free energy bias. Quite readable generally, articles frequently discuss and use hard science including formulas, mathematics, etc. It has a web presence at: http://www.teslatech.info.

Infinite Energy. (1081-6372) The official publication of the New Energy Foundation, IE is the creation of the late physicist Dr. Eugene Mallove. Decidedly pro cold fusion, the journal publishes articles on energy development and the hard science. That does not make it the easiest of reads. Its articles frequently require some knowledge of science and/or mathematics. The group has a web presence at: http://www.infinite-energy.com . It is available in most decent book/magazine stores.

Nexus. (1039-0170). An easier read than the previous entries**,** this magazine covers energy topics, criticisms of current medicine and corporate globalism. It occasionally strays into UFO's and new age type topics. Nexus is a refreshing bit of alternative viewpoints and is available at most decent book/magazinestores. It has a web presence at: http://www.nexusmagazine.com.

Free Energy News. Those who study this field of energy have their own online news outlet:
http://freeenergynews.com/newstuff/

ORGANIZATIONS

Most of the organizations I have come across are basically trade organizations or other advocates. These groups, as I have shown, do provide us with basic, solid information on their product. The Alternative Energy Institute(http://www.altenergy.org/) is the one I like the best. While it is an advocacy group, it does present essays on the pros and cons of all kinds of energy sources, from the basics to the future – just as I have done. This alone should prove a worthy resource.

MISCELLANEOUS

Here are a few sites that did not fit into the previous categories of resources but are beneficial anyway.

By Design (http://www.bydesign.com/fossilfuels/links/html/oil.html). This link give basic description of several of the fossil fuels.

The Alternative Fuels Chart (http://www.newton.mec.edu/Brown/TE/ALTERNATIVE_FUEL/STUDENTS/7C/GARSON/middle) is just that: a chart giving us the uses of the various current renewable energy sources.

http://www.aresearchguide.com/energy.html

. Department of Energy (http://www.energy.gov/engine/content.do). Our DOE is getting some good, useful information on its webpage.

Business. The *Source for Renewable Energy* page (http://energy.sourceguides.com/index.shtml) gives us contact with over 8000 businesses engaged in the alternative energy field right now!

Yahoo. Can any topic be done without the ubiquitous Yahoo? Here are it's Links:

http://dir.yahoo.com/Science/Energy/

http://dir.yahoo.com/Science/Alternative/

http://dir.yahoo.com/Recreation/Automotive/Alternative_Fuel_Vehicles/

Dennis Weaver (http://www.ecolonomics.org/). No, I'm not kidding. *Marshall McCloud* has long been a leader in the environmental movement. He is now player in the alternative energy movement. His *Institute for Ecolonomics* is a major educational force in this field. He also organizes drives (some up the coast in California, some across county) of alternative fueled vehicles. Called *Drives to Survive* (http://www.drivetosurvive.info) , his alternative fueled cars already do just that. Absolutely worth a look.

Energy is one of the biggest problems we face today. In this work, I hope I have let people l know that there are alternatives and that this is a problem with lots of solutions. Astronaut Edgar Mitchell has noted that there are three phases to achieving a vision: awareness, education and action. I is hope that this article has served at least as a first step. I also is hope that is also serves as the second step, making you aware that there are lots of ways to solve this problem. If this is "the moral equivalent of war", then we need to get going and start utilizing these choices.

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