

Emily Jablon

Professor Bent

2 February 2004

Energy Consumption: A Closer Look

Continuing expansion of the world population results in increasing demands for energy to support human existence. I will concentrate on countries that use a lot of energy from fossil fuels, as well as examine countries that are increasingly becoming dependent on alternative forms of energy, such as nuclear energy and hydroelectricity, and others including geothermal and solar energy. The fossil fuels I am going to examine are coal, natural gas, and oil. Within the sector of oil, I will specifically show the demand for petroleum imports. I will also concentrate on renewable energies, such as nuclear energy, hydroelectricity, geothermal, and solar energy consumption. Some forms of energy are rapidly depleting, such as oil, coal, and natural gas, and if countries do not increasingly diversify their reliance upon fossil fuels, there will be economic tragedies in the near future. Recognizing this problem, countries around the world are relying more and more on renewable energies, not only for the economic benefits, but also for the environmental benefits which result in healthier living conditions for all human beings.

Coal is a fossil fuel that poses serious threats to our environment, including greenhouse gases, acid rain, and air pollutants. It has the lowest consumption rate among all fossil fuels. Among all countries, Japan had the highest consumption rate of over 150 million tonnes of oil equivalent (Mt's). This country accounts for one forth of the world's

total coal imports, which reached 659 Mt's (*Key World Energy*). Countries need to focus on alternative renewable sources of energy so they can become more self reliant. This is important because economies are so susceptible to price fluctuations, and developing countries with weaker economies would especially benefit. Developing alternative sources besides fossil fuels will also help keep global warming and related health problems to a minimum.

Although natural gas is the cleanest fuel, it produces greenhouse gas emissions, lowers air quality and increases acid rain, and pollution from industries and transportation sectors. The United States imports the most natural gas, which amounts for 110,000 billion metric meters. Germany comes in second with about 80,000 billion cubic meters. 703,766 is the world total of natural gas imports (*Key World Energy*).

Oil is probably the most hazardous fossil fuel, with negative effects such as numerous oil spills, Co₂ emissions, and other dangerous chemical emissions. This type of energy supplies the most widely used sector, being petroleum products. Most of this sector is primarily used for transportation. Not surprisingly, of all fossil fuels, the United States consumes the most crude oil, coming in at 526 Mt's. The second highest consumer is Japan, with only 209 Mt's. The world total is 2,057 Mt's, and therefore, the United States consumes over 25% of the world total of oil consumed (*Key World Energy*). This excessive rate of consumption poses serious threats to the economic future of the United States. If the country wants to keep unemployment down, inflation rates low, and the deficit to a minimum, then there needs to be more research and expansion in alternative fuel sources. This is becoming increasingly important due to uncertain relationships with the Middle East, which supplies a good percent of the world's oil.

Focusing specifically upon petroleum products, the United States is also the highest consumer, at a rate of 80 Mt's. The Netherlands and Japan tie for second with only 47 (Key World Energy). According to the Energy Information Administration, "petroleum products fall into three major categories: fuels such as motor gasoline and distillate fuel oil (diesel fuel); finished nonfuel products such as solvents and lubricating oils; and feedstock for the petrochemical industry such as naphtha and various refinery gases. Demand is greatest for products in the fuels category, especially motor gasoline" (*International Renewables*). Transportation uses a huge 67% of petroleum, while industries use only 12%. U.S. Residential/Commercial and the electric utility sectors account for the remaining 8 percent of petroleum consumption. (*International Renewables*).

Despite its benefits, the transportation industry has yet to fully convert to alternative fuel sources. Of renewable energy, residential commercial and public use accounts for 58% of total use, while transportation accounts for only 3% (*Renewables*). This is somewhat discouraging since transportation and industries consume most of the available energy.

Transportation may be where petroleum products are most valuable. It would be hard to fly an airplane on nuclear, hydro, solar, wind, geothermal, tidal, wave, or wind power.

Although it seems like the United States is the primary culprit in fossil fuel energy consumption, it is investing a lot of money—not half as much as it took to finance the war in Iraq or national military defense--into alternative renewable energies, such as

nuclear energy. Nuclear energy is produced by power plants that make energy for widespread use.

Nuclear power is used almost entirely for electricity generation.

It has been somewhat of a controversial issue because of the dangerous production process. Despite this, the United States consumes an incredible 768.8 billion kilowatt hours of the North American total of 850.0 billion kilowatt hours. Western Europe consumes the most nuclear energy, with 875.4 billion kilowatt hours with the total world consumption being only 2,520.7 billion kilowatt hours (*International Renewables*).

Hydroelectricity involves using moving water to produce electricity and is beneficial because it does not create lots of chemical emissions. It can supply like areas like states. North America and Asia consumed the most billion kilowatt hours of hydroelectricity at almost 600 billion kilowatt hours, with Western Europe close behind, at around 550 billion kilowatt hours. Canada was the highest consuming country, with over 300 hours, and the US came in a little over 200 (*International Renewables*).

Other resources such as geothermal energy, solar energy, and wind energy account for a small percent of the world's total energy. They are not as reliable as nuclear and hydroelectricity energy, but still provide numerous benefits with little or no environmental costs.

Solar and wind have a lot of potential, but they do have environmental costs: it takes large areas to collect substantial amounts of solar and wind energy, and some consider windmills (wind turbines is a better term) to be noisy, unsightly, and hazardous to migrating birds.

While it is clear that some countries rely heavier on fossil fuels than others, it is becoming increasingly important for countries to equally diversify all sources of energy. Because the transportation sector guzzles so much fossil fuel energy, consumers must choose to take an active role in urging automobile industries to increase research and production in electric powered cars. This provides numerous benefits, most importantly being economic efficiency and security, and healthier environments and social living standards.

This depends on how the electricity is generated. But it is true that the automobile is the most wasteful way most of us use energy. So, if you want to do something personally to save the planet, think about what kind of car you own and how you use it.

Very nice graphics!

Works Cited

1. Academic. OFFSTATS. 22 January 2004. *Key World Energy Statistics 2003*. <<http://www.iea.org/statist/index.htm>>
2. Academic. OFFSTATS. 31 January 2004. *International Renewables Information*. <<http://www.eia.doe.gov/emeu/international/electric.html#IntlRenewables>>
3. Academic. OFFSTATS. 31 January 2004. *Statistical Review of World Energy 2003*. <<http://www.bp.com/subsection.do?categoryId=95&contentId=2006480>>
4. "Million Tonnes of Oil Equivalent." 1 February 2004. <<http://www.iea.org/stats/files/mtoe.htm>>
5. "Petroleum Products." 1 Frebraury 2004. <<http://www.eia.doe.gov/neic/infosheets/petroleumproducts.htm>>
6. *Renewables in Global Energy Supply*. 22 January 2004. <www.iea.org>