

# Energy Shift™

July

2006

## Ethanol is Not a Silver Bullet

A month or two ago there was a great deal of attention paid to ethanol. This was partly due to the fact that gasoline prices were spiking again, reaching about \$72 a barrel, but this was also because American car makers were promoting their new E85 cars and some of the American oil companies were promoting their plans to expand the availability of E85 fuel.

It is terrific that we can grow crops (i.e., a renewable source) that can be used to produce ethanol, which then can be used to fuel our cars. Rather than targeting crops that are currently used for food, or for feed for livestock, clever planners will look for products that were otherwise considered waste. In fact, there are numerous cases where “trash to treasure” scenarios are being tested to see if ethanol production is viable with different waste streams. As long ago as 1979 the Department of Energy published a report documenting the potential use of the 1978 surplus of whey and dry milk into approximately 85 million gallons of ethanol. In 2001 the California Energy Commission sponsored a study on the costs and benefits of a waste-biomass to ethanol industry in California. The study concluded that although considerable energy is used to produce ethanol, the net benefit of creating the alternative fuel, air pollution avoided and waste products put to beneficial use (such as “straw” from a rice harvest) outweigh the costs. The primary concern expressed in the study was the existence of sufficient demand for the ethanol, which would no longer be the case.

Ethanol production could potentially create a market for current waste products that are buried in landfills or incinerated. It could create jobs by requiring the collection and transport of materials to new factories built to make ethanol (perhaps located near a source of the feedstock waste material). Construction and operation of such production facilities would also create jobs. However, planners and decision makers must not stop here. It is

dangerous and unrealistic to create the impression that we can continue to “guzzle” fuel since we have “discovered” a new one for our cars. The estimates on how much ethanol would be available to quench our thirst for gasoline vary widely. Most estimates appear to be greatly influenced by politics or perspective but at best ethanol (from whatever source) would replace only a small percentage (less than 20%) of our current demand and a substantial amount of resources, energy and other materials, would need to be invested to develop and deliver a reliable ethanol supply to the pump.

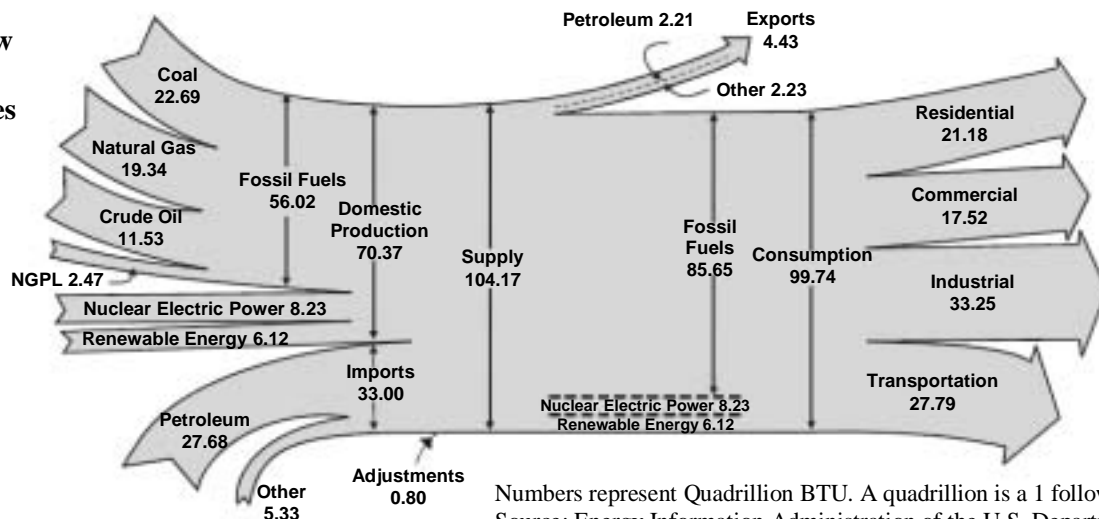
## It's More than Just Gasoline that Keeps Us Going

There has been a lot of talk about the price of gasoline lately. This is not surprising, as most of us are heavily reliant on our cars. Many businesses depend on trucks to bring them raw materials and then turn around and depend on trucks again to deliver their finished products to the consumer. Others must endure long commutes to work or live deep within a subdivision where even a “quick trip” to buy groceries requires several miles of driving.

What is surprising is the absence of a broader discussion about our energy needs in general. While Americans do consume 21 million of the 84 million barrels of oil used each day, we also require energy to operate machinery in factories; to heat and cool our homes, places of business and schools; to move trains; operate agricultural machinery; and fuel airplanes—just to name a few of the uses of energy we take for granted each day.

If you take a look at how these essential daily activities are fueled you will observe that the overwhelming source of energy is from fossil fuels. The energy mix of the future will require far more diversity than what we now use. The U.S. Department of Energy reports that the “energy flow” in America looks about like this:

### Energy Flow in the United States



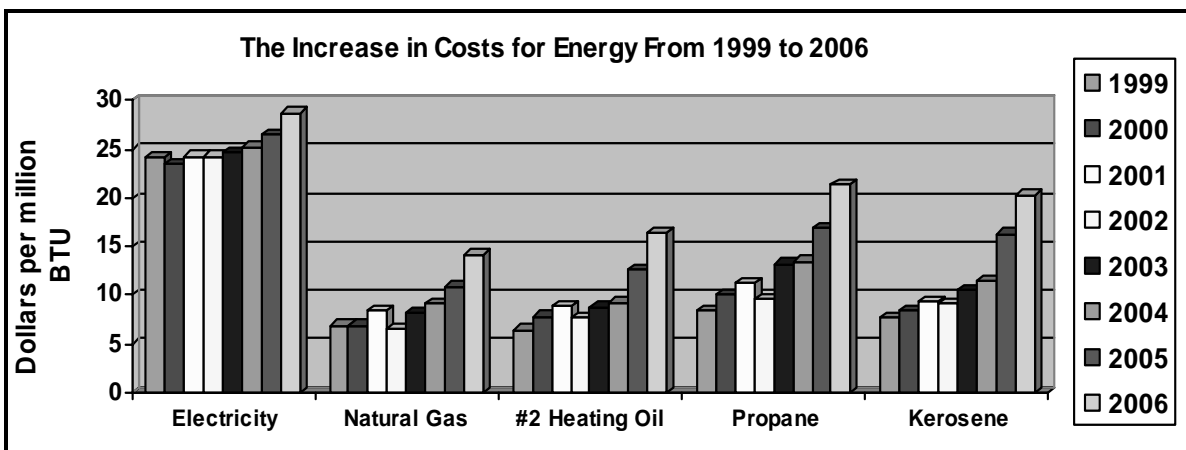
Numbers represent Quadrillion BTU. A quadrillion is a 1 followed by 15 zeros  
Source: Energy Information Administration of the U.S. Department of Energy

Now, consider the impact of 86% of our energy coming from fossil fuels, 8% coming from nuclear electric power (increases in nuclear power sources are slow to come on line at best and are often extremely controversial and virtually impossible to site) and only 6% coming from renewable energy sources. Fossil fuels are not only finite (although some will argue the supply is much greater than what others claim, and all agree that there are extensive quantities of coal) but are also a source of pollution that negatively impacts human health and the environment. There is no debate as to the growing demand for energy and entrenched habits being slow to change.

Our energy shift needs to accelerate **now**. We will always use fossil fuels and we will always need to add to and adjust the energy mix. What is meant by “energy mix”? It is the complex combination of energy used to sustain us. It is the combination of **human energy** (ranging from conservation to the ingenuity

needed to invent better, more efficient cars); **renewable energy** (wind, solar, hydroelectric power, geothermal, wood, waste, and ethanol); and **fossil fuels** (oil, natural gas, coal and their derivatives such as gasoline, liquefied natural gas, or coal coke); with the appropriate use of each component **for its best and highest use** (not wasting gasoline on gas guzzling cars driven for frivolous purposes but saving it for required trips in efficient vehicles or for moving food from rail car to market).

If you are motivated more by money than other concerns, consider that the cost of your primary sources of energy (not even accounting for gasoline prices) over the last seven years is up across the board. The cost for electricity, already the most expensive source of energy, is up more than 19% and the increased cost for all other sources shown is well over 200% since 1999.



BTU = British Thermal Unit

“million BTU” = a unit of measure used to compare energy sources of differing characteristics, for example a 1000 cubic feet of natural gas, a gallon of #2 heating oil, and a kilowatt hour of electricity can be compared using cost per million BTU

Source: National Propane Gas Association compiled information from the United States Federal Register

## The Future of Electricity Rates

Just when the news about the price of a gallon of gas seemed to be more than many could handle without getting angry, there is more news on the horizon—electric rates will be going up in the near future, too. This increase will not be a result of greed among the utility companies but a result of their unwillingness to maintain the nation’s electrical infrastructure, regulator’s rate caps, consumer’s insatiable demand for electric power, and the need to find better ways to produce electricity.

In the 1990’s the deregulation of the electric utility industry occurred. What does this mean? First, this was meant to create a benefit for consumers by allowing the utility industry to operate under a free market and consumers would theoretically enjoy low rates due to competition among electricity providers. Next, temporary caps on electricity rates were put in place to protect consumers while potential competitors had a chance to mobilize and create options for consumers. In other words, you would be able to select your electricity provider just as you are able to

select your phone service company. In many states these caps are now or will soon be expiring and rates will rise or fall as the free market allows.

Forming an electric company is not a simple undertaking, but some cooperatives were formed, new companies did evolve (or devolve, Enron was to be a major player under the new scenario) but generally many areas are still served by essentially one electric service. With the rate caps expiring in many states, many electric power producers are eager to boost rates that in some cases have been frozen for more than a decade. The problems with the caps were many. Most notably are two: 1) electric companies were not motivated to innovate or engage in preventative maintenance of the infrastructure while profits are being held down; and 2) relatively cheap energy inspires unconscious waste and unrealistic expectations from consumers. Now, energy companies find themselves with an aging infrastructure (infrastructure refers collectively to the power lines, grids, plants etc.), which in some cases is very old; and



environmental requirements to limit air pollution. New cleaner methods for generating electricity must be created. Existing systems must be better maintained where it makes sense and dismantled where continued use presents an unacceptable risk (either due to air pollution or the unreliability of power supplied—remember the power outage that impacted areas from Ohio to the northeast and into Canada a few years ago?). These actions will not occur without the expenditure of money. That money will be derived from selling electricity to consumers. Not only will individuals experience increased costs, but costs for

businesses that buy electricity will increase as well. It is in all of our best interest to insist on better (e.g., reliable) cleaner (e.g., not fossil fuel based) sources of electricity. As a nation we have to conserve to keep demand at a level that the electric power producers can meet. Otherwise, consumer costs will be high, demand may exceed supply and power outages will become more common. Power producers will have good reason to claim their rates should be increased to cover the cost of repeatedly needing to construct new power plants to provide more energy.

**Interconnectedness** (in'ter ke nek'tid nis), n. the quality or condition of being interconnected; interrelatedness; the interconnectedness of all nations working toward world peace. [1920-25; INTERCONNECT + -ED + -NESS] From the Random House Dictionary of the English Language, Second Edition, Unabridged.

**Green Roofs Developed as a Storm Water Management Tool, Also Save on Heating and Air Conditioning Costs**

Green roofs, or the practice of placing vegetation on rooftops to collect and slow down the water otherwise rushing off of roofs in urban settings, are slowly gaining momentum. Why do we care about rainwater rushing over paved surfaces? Because it picks up the pollution and heat (in the summer) from these surfaces and dumps it in a violent churning fashion into nearby creeks, streams and rivers. This has a very negative affect on the living things that inhabit the nearby waterways.

Green roofs not only provide a garden oasis in a sea of urban concrete, steel and glass, and slurp up many gallons of rain water to support the grasses, plants and even small trees planted there, but also result in impressive savings in heating and cooling requirements for the interior of the buildings on which they are located. The Environmental Protection Agency website states that, "On hot summer days, the surface temperature of a vegetated rooftop can be cooler than the air temperature, whereas the surface of a traditional rooftop can be up to 90°F (50°C) warmer" —that means on a 90°F day, the roof top might be 88°F instead of more than 150°F! Environment Canada found that savings on heating and cooling costs varied depending on the size of the building, climate, and type of green roof. They reported that a "typical one storey building" with a grass roof and 10 cm (3.9 inches) of growing medium would result in a 25% reduction in summer cooling needs. Field experiments in Ottawa, Canada, found that a green roof with a 6 inch depth of growing medium reduced heat gains by 95% and heat losses by 26% compared to a reference roof.

Chicago ranks number one in the nation in square footage of roof space devoted to vegetation with Washington D.C. following in second place. Check out some of the projects in Chicago, including City Hall a project installed in 2001, at [http://www.madisonenvironmental.com/events\\_greenroof4.html](http://www.madisonenvironmental.com/events_greenroof4.html) and the recently installed green roof at the American Society of Landscape Architects in Washington, DC found at <http://www.asla.org/land/050205/greenroofcentral.html>.

**Is Your State Listed?**

**Wind Energy Generation by State:** As of January 2006 California had the largest generation capacity (2,150 megawatts which is 24 percent of the nation's total), and New Hampshire had the smallest generation capacity (0.05 megawatt).

Rank	State	Wind Generation Capacity (Megawatts)
1	CA	2,150.00
2	TX	1,995.00
3	IA	836.00
4	MN	744.00
5	OK	475.00
6	NM	407.00

Rank	State	Wind Generation Capacity (Megawatts)
7	WA	390.00
8	OR	338.00
9	WY	288.00
10	KS	264.00
11	CO	229.00
12	NY	186.00

Rank	State	Wind Generation Capacity (Megawatts)
13	MT	138.00
14	PA	129.00
15	IL	107.00
16	ND	98.00
17	ID	75.00
18	NE	73.00
19	WV	66.00
20	WI	53.00
21	SD	44.00
22	TN	29.00
23	HI	9.00

Rank	State	Wind Generation Capacity (Megawatts)
24	NJ	8.00
25	VT	8.00
26	OH	7.00
27	MI	3.00
28	AK	1.00
29	MA	1.00
30	UT	1.00
31	AR	0.10
32	ME	0.10
33	NH	0.05
	US	9,149.0

Source: Wind Energy Association Website

### Something to Think About

Do you read about “Global Warming” or “rising gas prices” or promising “new technologies” and then just go about the business of your life? It’s easy to do that. We all have a momentary empathy, or excitement, or alarm that potentially moves us to action. Then the reality of day-to-day life kicks in and this newsletter is laid on the table or the news program is turned off. Figure out what you can do, today, that contributes to your energy shift—and then do it!



### Mission Statement:

The mission of Energy Shift™ is to help people move away from fossil fuel use through education, conservation and the use of alternative products and practices. Energy Shift™ wants to inform individuals about choices they have in how they consume energy. We are dedicated to educating and encouraging energy consumers to make choices that shift energy consumption away from polluting, often imported, fossil fuels to renewable energy sources or more efficient products.

Go to our web site at [www.energyshift.us](http://www.energyshift.us) or write us at P.O. Box 6549, Falls Church, VA 22040 with your comments, questions or to purchase an energy saving product. We would love to hear from you.

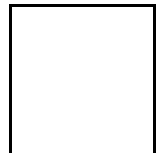
### A Good Book

Perhaps an obvious choice, but a worthwhile read: An Inconvenient Truth by Al Gore. If you enjoyed the movie, the book will provide a reference for all of the data presented during the movie. If you didn’t go to the movie, the book enables you to take in the information in small doses, which many may prefer anyway.

***Spread the word!! Request Energy Shift™ bumper stickers for your car (or bike), bulletin boards, or any other creative location you select. Contact us at [www.energyshift.us](http://www.energyshift.us)***



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