

Petroleum's Ubiquitous Nature It's in Just About Everything...

There is a whole lot of talk about the price of a gallon of gasoline these days, but less about the eventual impact the price of a barrel of oil will have on the cost of just about everything.

Petroleum is distilled, or refined, into dozens of materials that are then used as raw materials for the manufacture of many of the things we touch everyday. There is a lot of concern about the price of oil and its impact on transportation. We hear of the difficulties the airlines are having, and the rising cost of food due to competing uses for corn, rising fuel costs for farm equipment and the trucks that take our food to market, but that is just the tip of the iceberg. The relatively low cost of oil for the past one hundred years or so has contributed to it becoming an integral part of virtually every aspect of our lives.

Petroleum is used to make:

- Medicines;
- Moisturizers and other personal care products;
- Plastics (of countless types with many thousands of applications);
- Synthetic clothing;
- Foods (!);
- Cleaners;
- Graphite and other carbon based components;
- Paints and inks; and
- Not to mention fuels to heat our homes and run our cars.

We need to view the world, and the wonderful things that we are lucky enough to have, both natural and man-made, as precious and valuable. The low, low cost of fuel has facilitated the inexpensive manufacture of the things that make us comfortable and life “easy” compared to life elsewhere or in the past. Everything, everything—is valuable. It is that simple. It is no longer okay (and frankly never was) to casually shrug off tossing something into the trash because it needed to be repaired (think \$99 DVD player) or could be replaced at such a low cost that it was too much trouble to save it

(pulling the paper clip off of papers before recycling them, or using an unmatched cup or saucer).

Petroleum must be conserved and used where there are no apparent substitutes yet. Whether it is driven by price hikes or by scarcity in places, petroleum should no longer be “wasted” in traditional uses for which we have found substitutes such as wind, solar and geothermal energy.



This view of a California oil field from the 20th century is not much different from the current day solar array or wind farm that many object to as an eyesore.



Also in California, this wind farm does impact the view, but is not appreciably different from the oil fields that are tolerated due to the essential role they play in our lives.

Preparing a Garden Spot—Start Now for Next Year's “Victory Garden”

Whether you already dabble in backyard or balcony gardening or not, you may want to start thinking now about what you want to try next year. Composting provides an end use for what many send off to a landfill on a regular basis. In addition to the energy saved by

keeping the waste where its generated, rather than trucking it off thirty or forty miles (if you are lucky, some communities must send their waste distances of several hundred miles), it will enrich your soil and provide nutrients that support growth in next year's vegetable garden. Of course, you have to be careful that you only compost vegetable matter: leaves, grass, clippings, kitchen waste such as peels, coffee grounds, stems, cores, etc. Never put fats or meats into the compost (e.g., do not scrape plates into the container that is used to collect items for the compost; instead, collect items on the preparation-end of activities in the kitchen). There are dozens of good sites on composting. One that Energy Shift recommends is <http://www.compostguide.com/>.

Another addition to your garden that is getting a lot of attention in scientific circles but is yet to be widely shared with the general public is the addition of charcoal to your garden. The addition of charcoal is reported to 1) greatly improve crop yield, 2) significantly improve water availability for plants in both sandy and clayey soils, and 3) act as a carbon sequestration tool for keeping carbon (a primary contributor to climate change) out of the atmosphere. The charcoal should be broken down into small pieces or powder and will remain in the garden indefinitely—it does not degrade. If our farmers adopted this “technology”, it would not only greatly reduce the use of petroleum-based fertilizers, it would also capture and hold a significant amount of carbon, keeping it out of the atmosphere.

We do not have to wait for farmers to adopt this practice, however. Anyone and everyone who gardens can begin adding charcoal to the garden. While this may sound like a drop in the bucket, if half as much charcoal was mixed into soil as fertilizer is, then millions of tons of carbon based charcoal would be mixed into the soil, keeping the carbon in the earth and reducing our need for fertilizers made from fossil fuels.

Many add compost to loosen heavy clayey soils and enrich the soil but find it difficult to add enough to bring the soil to an optimum level. Now you can add charcoal too. Between the two, over time, you will enjoy the satisfaction of delicious homegrown food, reduce your carbon footprint, and get some fresh air and exercise. To learn more about carbon in the garden go to these sites: <http://www.css.cornell.edu/faculty/lehmann/index.htm>, http://www.css.cornell.edu/faculty/lehmann/terra_preta/Flyer%20terra%20preta%20landuse%20strategy.pdf and, <http://www.biochar-international.org/home.html>.



Cornell biogeochemist Johannes Lehmann shows how reproducing the Amazon's black soil could increase fertility and reduce global warming. Cornell researchers applied charcoal to a field on Game Farm Road to study the soil's properties.

Conserve Water to Save Money and Energy

Of course, it depends on where you live, but many of us assume that saving energy and conserving water are two completely different and unrelated things. We may see them both as “green” things to do, or good for the planet. But the relationship ends there. Actually, water use consumes a significant amount of energy. The first thing we may think of is that it does take energy to heat water; and it is true, water heating consumes a great deal of energy. But there's much more to it than heating—there is the energy needed to treat the water to make it potable and then there is the power needed to pump it from the source to where it is ultimately used. Sometimes this involves long distances.

In 2005 the California Energy Commission Report on California's Water – Energy Relationship concluded that 19% of the electricity used in California was consumed just to bring clean water to homes; 30% of natural gas consumed goes toward processing and moving the water to its useful endpoint. Another 88 billion gallons of diesel fuel were also consumed in the course of operating water related systems during 2005. Energy use in water systems is measured in kilowatt-hours per million gallons (kwh/MG). In southern California, the 12,700 kwh/MG used makes the system in use in 2005 just 9% more efficient than desalinating water from the ocean.

Meaningful gains in technology are being made. While conservation is what will have the single largest impact



on water/energy consumption, there is a small army of innovative entrepreneurs that are creating solutions. Just as the use of charcoal in soil discussed in the previous article will give many another tool to use in their personal quest to do all that they can to lower their impact on the planet (and save money while they're at it), a company in Japan has developed a new type of water faucet.



Touch-less faucets become energy generators instead of energy consumers thanks to a new product developed by Japanese company, Toto.

Most of us have seen touch-less faucets; they are often installed in newer public bathrooms, such as those in airports and large office buildings. These faucets not only decrease the rate of infection but also keep people from letting the water run while they are not actually washing their hands. What may not come to mind when observing a touch-less faucet is that they require electrical energy or a battery to run the infrared sensing device. Now, Toto a Japanese company that makes simple, elegant, and water-saving bathroom fixtures has developed a touch-less faucet that also saves energy.

The **EcoPower** faucet contains a small turbine inside. The turbine, powered by the water running through the faucet, creates an electrical current that is stored in rechargeable cells. The faucets supply the energy they

need to operate by using the flow of water to spin a high-efficiency turbine to both generate and store power. EcoPower replenishes its charge with five uses per day, and with ten uses a day, the backup battery itself is rarely used and can last up to 19 years.

Update on Ethanol; Industrial-Scale Facility to Produce Biofuels From Garbage Underway

We could have been first... but all that really matters is that the planning, funding and construction of industrial-scale facilities that will produce ethanol from municipal waste is happening. Plans for a facility are close to moving forward in northwestern Indiana and others are being discussed for New York City and Bridgeton, NJ. So far, however, in the U.S. it's mostly talk and little action. Our neighbors to the north have moved from discussion to implementation.

In late June the City of Edmonton issued a press release announcing that they will be home to the world's first industrial-scale facility to produce biofuels, primarily ethanol, from municipal solid waste—a project with an estimated cost of \$70 million. The City has signed a 25-year agreement with Greenfield Ethanol, Canada's largest ethanol producer, and Enerkem a biofuels technology company.

The plant will produce more than nine million gallons of biofuels per year initially with the ability to increase production. At its initial production rate the fuel produced will reduce Alberta's carbon dioxide emissions by more than 6 million tons over the next 25 years, which is the equivalent of removing 12,000 cars from the road. The City of Edmonton and the Government of Alberta, through the Alberta Energy Research Institute are contributing \$20 million to this venture. Edmonton will also invest \$50 million in a related processing facility and research center.

This partnership will enable the province to make a noted contribution to reducing greenhouse gases and become the first major city in North America to achieve a 90-percent residential waste diversion from landfill. This next-generation facility will also offer drivers a new choice in transportation fuels. For details about the parties involved go to:

<http://www.edmonton.ca/citygov/newsrsls/rls0409.pdf>



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.

A concept that asks us to rethink our approach to just about everything was organized into a framework by a Swedish pediatric oncologist in 1989—the framework is called The Natural Step. While only a handful of U.S. cities have adopted the Natural Step, most municipalities in Sweden have. Madison, WI has embraced the framework and is quite enthusiastic. Madison was one of the first U.S. cities to adopt the Natural Step and was the first to train all of its employees in the way it works. Madison Mayor Dave Cieslewicz said, “Just about everything we do has some sort of environmental impact. Everybody in city government who is making any decision at all will think of the implications for the environment.”

A wonderful case study in Madison involves cooking oil from a turkey fryer, a fiscal efficiency auditor, and a city engineer. When cooking oil goes down the drain, it causes problems for the people who unclog the city sewer system. Of even greater concern to the city is that this valuable resource does not go to waste.

The city's fiscal efficiency auditor wanted to turn that clog into fuel. The Streets Division has set up facilities to collect cooking oil at the city's recycling centers; and the city plans to use that grease to fuel the machinery that unclogs the sewers.

A City Engineering Department employee said, “It's kind of a nice closed loop. We spend a lot of time cleaning grease out of sewers, so if we can prevent it from going there in the first place, we'll reduce our maintenance and at the same time provide ourselves with an alternative source of fuel.”

Something to Think About



Plans for the world's largest wind farm were on the brink of falling apart when a German-based energy group and a Danish utility bought out Shell's 33% interest in the project. The German and Danish companies are now 50%-50% owners of the mammoth effort off the coast of Britain. Shell withdrew from the London Array project in May when it determined that the project would not bring in sufficient rates of return on investment. Although costs have gone up significantly since the project planning began, what message is sent when an oil company pulls out, and an energy company and a utility decide it is worth the additional investment to keep the project moving forward?

A Good Book

If the Interconnectedness piece above intrigued you, then you will enjoy *The Natural Step Story: Seeding a Quiet Revolution* by Karl-Henrik Robert. The book is inspiring and not only provides insight on the details of

the Natural Step, but relates interesting stories such as the King of Sweden's interest in the author's ideas were so great that they were mailed to every household in all of Sweden.

Energy Shift wants to help you put words into action. Begin your own personal energy shift! If you are already well on your way, share these ideas with others. Sometimes the best way to help someone get started is to give him or her something useful (like a cloth shopping bag or insulated outlet cover) instead of simply talking about making a change.

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