

EEVC NEWSLETTER

Published by the Eastern Electric Vehicle Club

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BACKYARD WIND POWER

On Sunday, August 6 the CBS Evening News ran a story about Carl Beldino, of suburban Mullica Hill, NJ, who has installed a 40-foot wind turbine in his backyard. The unit, he says, supplies about 25 percent of his power needs, and should pay for itself in five to ten years.

Beldino's turbine is a Skystream 3.7 from Southwest Windpower, Flagstaff, AZ, www.win-denergy.com, which quotes a typical installed cost for the unit as \$8000 to \$10,000 and says the unit will produce 4800 to 6600 kWh per year, depending on location. It begins to produce power at a wind speed of 8 mph and reaches full output at 20 mph. Unlike the turbines at commercial wind farms, the blades are just 12 feet long, and rated output is 1.8 kW.



The Skystream 3.7 from Southwest Windpower produces 1.8 kW and needs a tower just 35 feet high. The blades are 12 feet long and the low installed price gives it a reasonable payback.

WHAT NEXT? Oliver Perry

I don't know how much it costs to purchase a full two page ad in *The Wall Street Journal*, but it must cost more than most of us are willing to spend even to sell our house. Only companies like Chevron and British Petroleum (BP) seem to be able to afford them. And what are Chevron and BP trying to sell in such ads?

I saved pages A8 and A9 of the November 10, 2005 *WSJ* for such a time as this. The first of the two full sized "center spread" pages, colored in rich green, has only two statements. At the top, "YOU USE 25 BARRELS OF OIL A YEAR.", followed by "SO ARE YOU READY TO DO SOMETHING ABOUT IT?" in the middle of the page.

The second (right hand) page displays a clipboard with several memos attached. In the upper corner there is a vertical bar graph showing the predicted BTUs of oil that will be used by various sectors of (I assume the U.S. economy) in the coming years. Industrial needs will consume over 50%, followed by the transportation sector which appears to consume about half as much.

The printed portion of the advertisement begins as follows: "Because of surging economies in the developing world and continued growth among the industrialized nations, global energy is soaring. As a result, supplies are tight. Prices are rising. And energy users are calling for viable alternatives."

Do we agree? Most certainly. Such statements could be headlined in this newsletter by our editor himself.

The advertisement continues with some pertinent facts, "The good news is we've got a huge source of alternative energy all around us. It's called conservation, and it's the lowest cost new source of energy we have at hand. Since 1973 alone, improvements in energy efficiency have resulted in a 50% reduction of our daily energy use, which is as much as discovering 25 extra million barrels of oil equivalent every single day."

Further down in the paragraph ... "The use of more fuel efficient vehicles — including hybrids — is encouraging, and if automakers improved fuel economy across the board by just 5 mpg, we'd save over 22 billion gallons of gasoline a year." A diagram of the basic components of a hybrid car appears at the bottom of the clip board to supplement the above statement.

More statements. "The US consumes a million dollars of energy every minute.

"Replacing just one incandescent light bulb with a compact fluorescent lamp would save 500 pounds of coal and over ½ ton of carbon dioxide emissions.

"If just one in 10 homes used Energy Star qualified appliances the environmental benefit would be like planting 1.7 million new acres of trees."

Lastly Chevron takes credit for reducing its own energy consumption by 24% since 1992. They use cogeneration technology at their refineries. Chevron has helped initiate improvements that will lower Northern Cali-

fornia's postal service's electricity spending by 46 %. And, Chevron has helped the US government save taxpayers \$151 million while reducing greenhouse gas emissions by an expected 1.5 million tons.

Can you shout hurray for "Chevron!"? "Hurray for the petroleum companies!"? According to the ad they care! They are doing something about our need for energy. They are our energy providers. Should you trust them? Should we cease being so suspiciously critical? Do they mean well?

Part II

By the time you read this article it will be old news. But today it is a headline. Oil Price Surges as BP shuts off Big Alaskan Field! The *Wall Street Journal* article (Tuesday August 8) states that this news highlights the broader dangers of wear and tear on our nation's aging energy infrastructure. Apparently some sections of the oil line have suffered as much as 70% corrosion from the mixture of natural gas, water, and oil passing through the line today.

BP has relied on anti-corrosion additives to slow down the rusting process but claims that sand in the slurry has clung to the walls of the pipeline and thus has hindered the action of the anti-corrosive additives. Earlier in March of 2006 a dime sized hole in one of the lines allowed 4800 barrels of crude to escape to the tundra in the largest oil spill since production began in 1977. This prompted a Federal investigation.

BP spokesman indicate that they are using the latest ultrasonic and X-ray technology (as well as a "smart pig" probe to check on the condition of the pipe from the inside) in order to investigate the extent of the corrosion. They will shut down the operation until there is absolutely no chance of any more oil leaks polluting the tundra. This could mean the loss of the line for months! But, according to Michael Bolkovatz, a production manager at Prudhoe Bay, "the real goal of our program is to make these pipes last another 50 years."

So What Is My Point?

Does anyone remember the debates that raged many years ago regarding the sanity of drilling for Alaskan oil? Some said it was not worth investing in because what little was

under the tundra would only last a few years. The cry from conservationists then was to seek alternatives rather than invest in short term oil production. Many felt that the small amount of oil we piped to the US would not be worth the environmental risks. Obviously the oil companies thought differently. Even if the amount of oil discovered in any part of the world is small compared to the whole, there is plenty of money to be made in going after it. And right now a little here and a little there is affecting the whole.

Yes, the petroleum infrastructure is old and yes the price of oil jumps around from day to day depending upon how well the total infrastructure (political as well as mechanical) meets the demand. We are learning that our present delivery system just about matches our demand and that any slipup in the delivery system immediately affects all of us. That is why Republican members of congress are pushing for a passage of a bill to open the Arctic National Wildlife Refuge (ANWR) to oil drilling. Opponents of Arctic oil drilling have long argued that Prudhoe Bay only produces a small 8% of our energy needs and therefore is insignificant in the total picture. But, the fact that closing the Alaskan pipeline has immediately affected our gasoline prices at the pump illustrates that 8% of the supply (in the present tight supply vs. demand energy situation) is significant. So rather than reduce the source of our energy from oil to alternative forms, most legislators (with support from the public) will advocate increases in oil development rather than decreases.

You and I may take issue with our representatives over this. Perhaps this is a good time to push for more alternative solutions rather than drilling for more oil?

It is my prediction that with a current energy crisis constantly looming on the horizon, the large petroleum companies will be given more rights to drill and more favorable legislation for building refineries in order to reduce our energy shortages. Rather than take the alternative energy route we will continue to go after the huge amounts of "harder to get" carbon-based energy in the earth's crust. We will continue to spend the money needed for the infrastructure to link the energy sources in the ground to the fuel in the pump. And we will continue to pay more and more

for our energy, but not quite enough to make alternative powered cars more economical.

When the sea faring ships ran out of whales to chase, when the whales were no longer plentiful, the whaling industry died and the petroleum industry began. We have not run out of petroleum yet. The new energy, the alternative, is still down the road. But, who knows for sure just how far down the road it is?

We exist in interesting times. On the one hand we are addicted to big engines with big fuel tanks but on the other hand we are equally addicted to unrealistic low energy prices. Our pocketbooks are not quite big enough to meet the current needs of the SUV. And it does not appear as if we will ever return to the golden days of yesteryear. So what is going to happen next?

That is why we remain optimistically tuned in or "plugged in" as the current buzz phrase prefers to put it. There is more hope today than there was yesterday. Keep informed. Remain mentally a part of the EEVC.

NO WAY TO BREAK THE CARBON HABIT



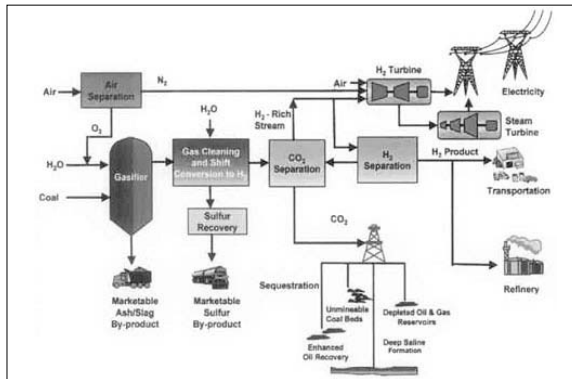
Artist's conception of the proposed plant.

We've recently heard about a group called the FutureGen Alliance, which plans to build a coal-fired power plant without any carbon emissions.

The organization (www.futuregenalliance.org), formed in 2005, is a consortium of some of the largest coal producers and power companies in the world, including American Electric Power, PPL and the Southern Company. Their plan is to build a coal-fired plant that would produce electricity, hydrogen and commercial sulfur (extracted from the coal), but emit little or no carbon

dioxide, which would be sequestered underground.

Plans call for a 275 MW plant (artist's conception above) that would capture and sequester 1 million tons per year of CO₂ and would be on line by 2012.



While many of the proposed plant's features are interesting, the big question is will CO₂ sequestration work? The Alliance has brought on board a group of experts in the field, and they plan to investigate such places to put the stuff as saline-filled rock formations, depleted gas basins, depleting oil fields, and bituminous and subbituminous coal basins. The group has two things to say about carbon sequestration (*italics ours*):

1. "Permanent storage of carbon dioxide in deep geologic formations (also known as geologic sequestration) *may* provide an important pathway to controlling carbon dioxide emissions while simultaneously ensuring affordable power."

2. "Geologic sequestration is part of a broad portfolio of technologies that *may* reduce the carbon intensity of the global economy. This portfolio includes renewables, energy efficiency, clean coal, nuclear, and other technologies."

Which makes us wonder if they really know. And, one wonders: Will they ever run out of places to put the CO₂? Once they run out of places in the earth, will they try pumping it into the depths of the ocean? That might be interesting, and not just because it raises the prospect of fizzy oceans: remember that a water solution of carbon dioxide is called carbonic acid, and reducing the pH of the world's oceans is probably not such a good idea.

Perhaps they'll try another tack. Years ago

China had an unexpected bumper crop of cabbage. There was more than the normal storage facilities could hold, so the government assigned every family so many heads of cabbage to store. Will the government and the carbon companies start giving each of us a tank, and tell us to store so much CO₂?

GEO WONDER: -LOGICAL AND -GRAPHICAL By California Pete



There was a momentary ripple around here on August 2: A mild earthquake (mag 4.4) a few minutes past 8:00 p.m. The epicenter was to the north, about 9 miles from Santa Rosa and 45 miles from our location. It was barely noticeable around

here, just a gentle (and somewhat creepy-feeling) side-to-side motion. Even at the epicenter there were no reports of damage or injuries (most of the calls to the local sheriff were people reporting that they had felt it), but it did bring to mind that The Big One is coming, and local preparatory efforts got a boost. Everyone is supposed to have an earthquake kit ready, plus plans on where to assemble after the temblor.

One of the problems with the San Francisco area can be traced back to the aftermath of the 1906 quake. The city government wanted to rebuild as quickly as possible (that's why they announced that only 478 people had died, and decreed that henceforth all announcements would refer to the Great San Francisco Fire instead of the Great San Francisco Earthquake), but they also wanted to minimize damage to the rebuilt city if there was another quake. Accordingly, they passed a stringent building code: No more unreinforced masonry, a strict standard on the ability of all buildings to withstand side loads — and, of course, all buildings would have to be fireproof.

Soon the builders complained that the new rules were slowing rebuilding efforts and adding to costs, so they were dropped. San Francisco didn't have a real building code until at least 1939, and that one was seriously

deficient. A 1976 change corrected much of that, but by that time thousands of seismically unsound buildings had been erected.

Earthquakes aren't the only disaster waiting to happen. In 1991 a firestorm swept 1520 acres of the hills above Oakland and Berkeley, destroying 2449 single-family dwellings and 437 apartment and condominium units and costing \$1.5 billion. The human toll was 25 killed and 150 injured.

On Sunday the 6th we went for a drive along the aptly-named Skyline Drive, which snakes along the crest of the hills and is lined with expensive homes and, on weekends, heavily travelled by people on mountain bikes who tend to appear just as you're rounding a blind curve with a 15 mph speed limit. The expression "million-dollar view" applies here, with breathtaking vistas of San Francisco Bay with Oakland on the near shore and SF in the distance.

While the houses are almost entirely masonry (no more wood shingle roofs allowed), the streets are lined with big eucalyptus trees with bark that peels off in sheets like cardboard. Both bark and leaves are filled with eucalyptus oil, and the trees basically explode when they catch fire. Areas that don't have eucalyptus trees have dry grass a foot or two high.

The area gets a big fire every ten or fifteen years on average, so maybe the time is getting close.

NEWS UPDATE

The *San Francisco Chronicle* for August 9 has an article that takes note of the latest phenomenon in EVs: High-performance luxury sports models. We've seen things like the



TZero (left) from AC Propulsion of San Dimas, CA, a two-seater that can go from 0 to 60 in 4.1 seconds and do the 1/4 mile in 13.2 seconds, and the Fetish, from Venturi Motors of Monaco, which debuted as a concept car in 2002 and appeared in these pages in December, 2004



following its showing at the Paris Auto Show. Like the TZero, the Fetish had a drivetrain

from AC Propulsion and claimed a top speed of 170 kph (106 mph) and acceleration from 0 to 100 kph (62.5 mph) in 4.5 seconds. Power came from a 180 kW (241 hp) electric motor fed by a bank of 100 Li-ion batteries with a capacity of 58 kWh. With a carbon fiber body and a weight of 350 kg (770 lb), claimed range was 350 km (218 miles). The Fetish shows up at auto shows, but there is no indication that anyone has ever actually bought one — possibly because the list price is 450,000 euros (before tax).



The newest of the high-performance, high-price models is the Tesla, from Tesla Motors of San Carlos, CA (www.teslamotors.com) and funded by a bunch of Silicon Valley entrepreneurs (rich guys). Based on the Lotus Elise and built on the same production line, the car has one unusual feature: the company plans to actually manufacture and sell it in quantity. A bare-bones model will go for \$89,000 and a more complete and luxurious one for about \$100,000 — which isn't all that much for people who move in the right circles. According to the *Chronicle*, "Tesla wants to sell 500 to 800 cars the first year and then ramp up to maybe 2,000 cars a year." You can get your change to order one on the company's Web site. Customer care centers will open around the country through 2007.

More on power from the sea

In February we discussed some proposals for wave power along the West Coast. An item by Heather Timmons in *The New York Times* for August 3 reported on progress around the world in commercializing tidal power, and an more recently an op-ed piece by San Francisco Assemblyman Mark Leno in the *San Francisco Chronicle* for August 9 strongly advocated the use of both wave and tidal energy. The Golden Gate itself is a channel several hundred feet deep, and an enormous amount of water rushes through with every change in the tides. Unfortunately, the California Energy Commission had put a moratorium on considering ocean power projects for grants because “they were being inundated with largely meritless requests to fund ocean-power projects and lacked the staffing to properly review them.”

Leno quotes the Electric Power Research Institute that “a wave plant a few miles off Ocean Beach and a tidal plant submerged in the Golden Gate ... together, would power more than 50,000 homes.” He has, he reports, been able to get the Commission to agree to accept proposals for a tidal-power demonstration project near the Golden Gate, so perhaps we’ll actually get something done.

Hydraulic hybrid?

Automotive Industries for August has a story by Nick Palmen about the recent unveiling of what the EPA and UPS billed as “the most fuel-efficient and cost effective delivery vehicle in the world.” The vehicle, says the article, uses a hydraulic hybrid propulsion system “developed in concert with leading automotive engineering firm, FEV Engine Technology, Inc. (FEV), whose U.S. Technology Center is located in Auburn Hills, Mich.”

The technology, says the article, claims to increase fuel efficiency by 60 to 70 percent in urban driving, and to reduce greenhouse gas emissions by 40 percent.

COMING EVENTS

Hydrogen 2006

Sept 11-13, Vancouver, BC. Contact Doug Sanborn, 207-781-9618, dsanborn@intertechusa.com, www.intertechusa.com

AltWheels — Alternative Transportation Festival

Sept 22-24, Boston, MA. Contact A. Sander, 800-510-6484, sanderalison@aol.com, www.altwheels.org

Southern California Clean Vehicle Technology Expo

Oct 10-11, ONtarion, CA. Contact: Jaime Nack, 310-314-1934, info@cleanvehicleexpo.com, www.cleanvehicleexpo.com

National AFV Day Odyssey

Oct 12, multiple location in the U.S., Canada and Germany. The closest to EEVC territory will be at the Catonsville Campus of the Community College of Baltimore County, 800 South Rolling Road, Baltimore, MD (contact Terry Wolfe, twolfe@ccbcmd.edu, www.cbcmd.edu) and at the U.S. General Services Administration, 490 L’Enfant Plaza, S.W., Suite 8214, Washington, DC (contact Sylvia McMillan, Sylvia.mcmillan@gsa.gov, www.gsa.gov

Convergence 2006

October 16-18, 20, Detroit, MI. Check www.sae.org.

The Solar Power Conference and Expo

Oct. 16-19, San Jose, CA. Contact Michelle Brownstein, 202-682-0556, www.solarpowerconference.com

Hybrid Vehicle Technologies Symposium — 2007

February 7-8, 2007, San Diego. Check SAE at www.sae.org.

MEETING SCHEDULE

Meetings are held in Room 35, Plymouth-Whitmarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

September 13

October 11

November 8

December 13