

Baltimore Unplugged **Urbanite #51, September 2008**

By: Greg Hanscom

Galen Frazer was seeing windmills again. Frazer, a laid-back 31-year-old Web designer, works on the tenth floor of the Behringer Harvard building, just across Pratt Street from the National Aquarium. It was early spring 2008, and he was driving to work from his home in Odenton. The trip gave him plenty of time to think. Among other things, he thought guiltily about the environmental impact of his commute and the growing concern over oil prices, global warming, and food shortages. The birth of his daughter, Ava, the previous summer had him worried about the future.

“What is this place going to be like in ten years?” he wondered. “Is it going to be like *Mad Max*? Are we all going to be out in the streets, fighting each other over water?”

Frazer is a biologist by training, and he brings a green consciousness to his current work at Planit, an advertising and Web design agency. (The office is a scene out of circa-1998 Seattle, replete with beanbag chairs, pool table, and cooler full of free Vitamin Water.) He started an office recycling program and convinced management to buy “carbon offsets” to make up for the firm’s energy use. “I always get teased,” he says: “I’m the resident treehugger.”

The previous spring, on his drive to work, Frazer had looked up at the buildings rising downtown and wondered, not for the first time, “Why aren’t the roofs of these buildings covered with windmills and solar panels?” Then he wondered what he could do to make that vision come to life, at least in the virtual world. At Planit, he and his colleagues had been using computer graphics software to add special effects to videos, he says. “We got talking about it: How neat would it be to create an image of a utopian city?”

They let the idea stew for about a year, and then Frazer and a couple of co-conspirators made their move. Interactive designer Nicholas Elizaga collected video footage while walking downtown. Alex Dippel, a 3-D animator, created a computer model of a wind turbine based on pictures he found on the Internet. Elizaga combined the two using a program called boujou that is a mainstay in the animated film industry.

On May 6, Baltimore *Sun* columnist Laura Vozzella got an e-mail from Ryan Smith—Planit’s interactive-art director, though he didn’t identify himself as such—asking if she’d “heard anything about these new inner harbor wind turbines.” The message contained a link to a site called Visit My Baltimore, which featured a thirty-three-second video showing four glimmering turbines spinning above the black smokestacks of the Power Plant. The video was so realistic that Vozzella rushed to the harbor to see for herself.

Frazer and company had a good laugh and went back to their jobs, wondering if anything would ever come of it. “Maybe by putting this video up there, maybe somebody at City Hall sees it and that starts something,” says Frazer. “Sometimes that’s what it takes.”

To date, the video seems to have amounted to nothing more than a “high-minded hoax,” as Vozzella dubbed it. But Frazer’s phantom wind farm posed some serious questions about the non-virtual world. Energy prices are exploding; experts are forecasting rolling blackouts in the near future. So why *isn’t* the Baltimore skyline bristling with windmills? Why are Marylanders still getting two-thirds of our electricity from burning fossil fuels, and less than 2 percent from the wind and the sun?

The answer to the first question is fairly simple: “Baltimore is where wind isn’t,” says Jeff Gilbert, one of the founding partners of Chesapeake Solar, formerly Chesapeake Wind & Solar. The metropolitan region is a black hole for economically meaningful breezes.

The answer to the second question is more complicated and stretches back to the 1970s—the last time Americans were freaking out about energy. Those were the days when President Jimmy Carter called the struggle for energy independence “the moral equivalent of war” and had solar panels installed on the White House roof.

But OPEC opened back up for business, energy prices plunged, and Ronald Reagan took the solar panels down in 1986. (One of the panels, the star of the new documentary *A Road Not Taken*, is now on display at the Carter Library in Atlanta.) Since then, spotty government support and cheap coal, oil, and gas have made it impossible for solar or wind to compete in the United States. Carter’s goal of supplying 20 percent of the nation’s power from the sun is still a distant dream: Today, renewables produce less than 10 percent of the nation’s energy; solar and wind combined amount to just 1.2 percent.

The failure to move toward renewables has put the country in a tight spot: With growing alarm over global warming, pressure is building to turn away from fossil fuels, but green power, real as it may seem, is still largely the stuff of dreams. No place is this dilemma more pronounced—or as potentially devastating—than Maryland. Last December, the Maryland Public Service Commission delivered a harsh wake-up call. With population expected to grow, the state’s aging electrical grid will be stretched to the breaking point during times of “peak demand”—sizzling summer days when we all have the AC cranked. Without immediate action, the commission wrote, we could face rolling blackouts as soon as 2011.

For a taste of what havoc power outages can wreak, think back to California in

2000 and 2001, when the state instigated rolling blackouts to compensate for energy shortages brought on by deregulation and market manipulation. Or recall the Northeast blackout of 2003. “Terrifying” is the word that Maryland Chamber of Commerce President Kathleen Snyder used to describe the prospect. “If we don’t have reliable power, we’re not going to be able to grow or retain jobs in Maryland,” she told the Associated Press this spring.

One solution: Import more power from afar. Affiliates of PJM Interconnection, the organization that coordinates electricity transmission across the Mid-Atlantic, have proposed building several new high-voltage power lines into the state. The first of them, the Trans-Allegheny Interstate Line, or TrAIL, would connect Maryland to power plants in southwest Pennsylvania, Virginia, and West Virginia. But the proposal has kicked up fierce opposition from environmentalists and rural residents who say it would carve through forests and across private property.

A second solution: Build more power plants. Constellation Energy, parent company of Baltimore Gas and Electric (BGE), wants to build a third reactor at the Calvert Cliffs Nuclear Power Plant in Calvert County. Acquiring the mountain of permits—to say nothing of the up to \$10 billion—required to build a reactor can take years, however. And while nuclear has come into green vogue because it produces no globe-roasting greenhouse gases, the federal government has yet to approve a place to permanently dump the tons of radioactive waste the plants produce.

Silver Spring-based Competitive Power Ventures wants to build a natural-gas-fired power plant near Waldorf. Burning gas is relatively clean, but extracting it can be environmentally destructive, and prices are on the rise. (In May, Sempra Energy shelved plans for a gas-powered plant in Frederick County.) There is no shortage of coal in these parts, but the Regional Greenhouse Gas Initiative, an agreement between Maryland and nine other Eastern states, requires any new coal plant to capture, or “sequester,” carbon to make up for greenhouse emissions—a largely untested, and potentially very expensive, undertaking.

A few idled plants could be jump-started. In June, for example, Constellation recommissioned the gas-fired Gould Street plant in South Baltimore. But these amount to only a few shovels full of dirt tossed into a massive hole. According to the Public Service Commission, if Maryland wanted to create enough electricity to provide for the coming population surge and make up for the quarter of its electricity that it already imports, it would have to add an additional four thousand megawatts to its generating capacity—equivalent to roughly forty Gould Street plants, or two-and-a-half new Calvert Cliffs reactors.

At last, you’re thinking: a window for renewable energy. Nuclear and coal are yesterday’s solutions. Roll in the windmills! Prop up the solar panels!

Try telling that to Wayne Rogers. Like Galen Frazer, Rogers has dreams of

windmills—and he has spent much of the past six years chasing them. Rogers is the president of Synergics, an Annapolis-based company that has been developing renewable power projects worldwide since 1980. In 2002, the company began planning a wind farm on Backbone Mountain, a remote Appalachian ridge in Western Maryland. Twenty-four giant turbines built there could generate forty megawatts.

Rogers ran head-on into a determined group of anti-wind activists who argued that the turbines would spoil views and kill birds and bats. He also, somewhat ironically, ran afoul of state environmental agencies, where biologists worried that the farm would disturb forest habitat. Rogers argued that the land had already been logged, and that concerns about birds and bats were overstated. Former chairman of the state Democratic party, Rogers helped convince the General Assembly to streamline the permit process for wind projects under seventy megawatts in summer 2007. Nonetheless, it will likely be the end of 2009 before turbines are spinning atop Backbone Mountain. And in June, Synergics announced that it had signed a twenty-year contract to sell its wind power—to Delmarva Power & Light. Constellation Energy did not pursue the opportunity to buy the electricity.

Solar energy, too, has been slow to take in Maryland, though the state is home to one of the industry's most promising upstarts: SunEdison. Started by Jigar Shah, 34, the Beltsville company has managed to shed one of solar power's greatest burdens: its upfront costs. Few homeowners can afford to lay down the \$20,000 to \$30,000 for photovoltaic panels. SunEdison sells its corporate clients the power, not the power plant. It has erected more than a hundred solar panel "power plants" on the roofs of Staples, Costco, and Whole Foods stores around the country. The only one in Maryland is on the company's roof.

What is working elsewhere that isn't here? Public policy backed by money, says Wayne Rogers. States such as Pennsylvania and Delaware have passed laws backing renewable energy and put substantial public funds behind them, he says: "You need foresight and long-term planning, and you need to invest in the long-term also." California is pouring \$3.2 billion into an effort to subsidize solar panels, and Texas utility officials recently announced a massive \$4.9 billion plan to build new transmission lines for wind-generated power.

Gov. Martin O'Malley has vowed to get Maryland into the renewable energy game, and he and the legislature made strides this year, setting a statewide mandate that utilities get 20 percent of their electricity from renewable energy by 2020, and increasing grant amounts for solar and geothermal energy. Michael Li, chief of staff for the Maryland Energy Administration, says that the grant money was snapped up by mid-year.

Excitement is building, but development is incremental. Renewables are still tomorrow's technology in Maryland, at least on a meaningful scale. "We're making progress," says Rogers, who was a member of Governor O'Malley's

transition team. “But you can’t turn the ship on a dime. It’s going to take a while.”

So the old solutions are off the table, and the new solutions are still out of reach. What do we do now?

This question, not surprisingly, is the topic of conversations in government offices, meeting rooms, and community centers around the state. A latticework of solutions is beginning to emerge that could create a bridge across the chasm at our feet.

That bridge will certainly include some new electrical generation, but in the near term, it will likely be from small-scale, localized or “distributed” facilities. A few of these will burn things we now consider “waste”—landfill and wastewater gas, as well as garbage and dead trees (see [“Deadwood,”](#) *Urbanite* April ’08).

But our best hope for bridging the divide, according to most experts, is a well-worn mantra that will sound familiar to those who were around when Jimmy Carter admonished citizens to turn down their thermostats and don sweaters. In a word: efficiency.

One of Baltimore’s most ardent champions of efficiency is a plainspoken 33-year-old named Earl Millett, who grew up in a trailer in Jessup. His father, Earl Sr., was a heavy equipment mechanic who fixed bulldozers and cranes—as well as his friends’ and neighbors’ cars. Faced with a problem, Millett is apt to roll up his sleeves and dive in with duct tape and twine. It’s an attitude that serves him well as he spearheads Project Light Bulb, a program of the nonprofit Civic Works that brings free energy and water efficiency gadgets to low-income homes. Workers install compact fluorescent light bulbs, adjust water heaters, air conditioners, and furnaces, and replace old faucets with “water wise” models. Millett’s key to success: He’s not saving the planet; he’s saving people money.

Mark Washington, executive director of the Coldstream Homestead Montebello (CHUM) Community Corporation in East Baltimore, says his group got involved with Project Light Bulb around the time electricity rates in Maryland spiked 72 percent as a result of a state law that deregulated utilities. “I don’t know if we have a green spirit so much as an impoverished community that cannot afford the escalating utility costs,” he says. “Being energy-efficient even on a small scale—replacing light bulbs and showerheads—goes a long way toward reducing costs.”

In its first round of work, funded by the Abell Foundation, Project Light Bulb tuned up 330 homes. On average, it saved homeowners fifty-three kilowatt hours per month. (A kilowatt hour is one thousand watts of electricity—enough to power ten 100-watt light bulbs—used for one hour.) That’s about \$8 a month in savings at today’s rates, or \$98 a year. Project Light Bulb has just started its second round of work, with the goal of servicing another two thousand homes.

When it is finished in two years, it will have retrofitted 1 percent of the houses in Baltimore, saving low-income residents close to a quarter million dollars annually if rates hold steady, which is unlikely.

And it's not just low-income households that need work. Michael Li says that Californians use 42 percent less electricity than Marylanders on average, largely because of the state's tight efficiency programs, as well as efforts to educate residents about how to use less. "If you asked the average Marylander what unit electricity is sold in, they wouldn't be able to tell you," he says. "They know gas is sold by the gallon, but they don't know electricity is sold by the kilowatt hour, or what a kilowatt hour costs."

Davis Bookhart, director of the Sustainability Initiative at Johns Hopkins University, points to a recent study from Oak Ridge National Laboratory that found that Americans could cut our energy consumption 25 to 30 percent using existing, readily available technology. "We're talking about plain old off-the-shelf stuff that's right there at the hardware store: compact fluorescent light bulbs, more insulation," he says.

Tuning your house for maximum efficiency isn't as sexy as installing high-tech green gear, but it's far more cost-effective, says Frank Lee, who does home energy inspections for the local firm TerraLogos (see ["Seal of Approval," Urbanite May '08](#)). "If I was to get the smallest [solar] photovoltaic system on my house"—which would set him back about \$17,000 after all the rebates and incentives—"it's going to take me between ten and fifteen years to pay that off," he says. "I could get the same energy savings with about \$2,000 to \$5,000 of investment in conservation."

If a homeowner can save thousands, imagine what a large corporation, with an electric bill soaring into the millions, can do, says Rafael Coven of GreenSpark Energy Solutions, a Baltimore company that specializes in ratcheting down energy use in supermarkets, hospitals, warehouses, and other buildings. Most companies can whack 30 percent of their energy use with easy, cost-effective fixes, he says.

Joe Postelnick, facility director of the medical supply company Medline, says he was initially skeptical when Coven proposed installing "retrofit controllers" on the heat and air conditioning units in the company's huge warehouses. The gadgets cycle the machinery on and off, maintaining the desired temperature while reducing energy use. A pilot project in an Allentown, Pennsylvania, warehouse made a believer out of him. "In one month alone, we saved close to \$18,000," he says. "The project paid for itself in four months." The company has since installed the controllers in several other facilities, and may soon require them in all new buildings.

The trend is taking off at the institutional and government levels, too. Hopkins University has installed new light bulbs, tightened doors and windows, and

replaced the traps on the university's miles of underground steam pipes. "Dollar for dollar, replacing steam traps versus putting up solar panels—there's just no contest," Bookhart says.

Baltimore City came to the same conclusion several years ago as it contemplated the pending rate hike, says city energy advisor Ted Atwood, who worked for the U.S. Department of Energy for two decades, then for a bank set up by the Carter administration to promote "synfuels" such as gasified coal. He sums up the logic: "The cheapest power is the power you don't use." City crews went to work replacing traffic light bulbs with new, super-efficient light emitting diodes, or LEDs. The upgrade was projected to save \$800,000 a year, he says. As electricity prices have climbed, the annual savings have risen to \$1.1 million.

Atwood says efficiency measures, combined with new small-scale electric generation at city facilities, have already saved the equivalent of ten days' output from a typical coal-fired power plant. "We haven't even scratched the surface," he says. "If we could get [those savings] up to three or four months, we'd have room for growth without the need for additional power generation."

As a part of her Cleaner Greener Baltimore initiative, Mayor Sheila Dixon has created a sustainability commission that has an air and energy work group. The manager of the mayor's sustainability office, Beth Strommen, says she doesn't know what the commission will recommend, but she is enthused about efficiency. "Let's make it so that they've wasted their time applying for those permits for those new power plants," she says. "That would be my battle cry."

Squeezing more out of the existing supply is now backed by a state mandate as well: Gov. O'Malley's EmPOWER Maryland initiative, approved by the legislature during the last session, aims to reduce per capita electricity use by 15 percent by 2015. State agencies are supposed to tighten up existing buildings, and construct all new buildings to meet the U.S. Green Building Council's silver Leadership in Energy and Environmental Design (LEED) standard. The new Maryland Strategic Energy Investment Fund should shovel millions of dollars annually into energy efficiency programs—many targeted at low- and moderate-income residents. The state is also offering training for contractors who want to carve out a niche in the eco-friendly building and remodeling market.

The electric companies, meanwhile, realize that their emphasis on selling as much power as possible has put them in a very precarious position. BGE is testing three thousand "smart meters" that allow it to monitor electricity use remotely and hourly, and reward customers for cutting use during peak hours. The utility is also pushing programmable thermostats that allow resident to turn down heat and air conditioning when they're not at home, and load control switches that allow the company to cycle off air conditioners for short periods during peak hours. Participating homeowners get rebates on their monthly bills.

Cutting back on demand during peak hours is critical: "Ninety-nine percent of the

time we have enough electricity for everybody,” says Michael Li. “It’s [peak demand during] those hot summer days that is generating the push to build new power plants.” If we moved aggressively to increase efficiency and reduce electricity use during those peak hours, Li says, “We would virtually eliminate the need for new power plants in the foreseeable future.”

In other words, we can build a bridge to tomorrow’s technologies by getting serious about the simple mantra of “Less is more.”

And make no mistake: The winds are changing. Texas oilman T. Boone Pickens recently announced that he is laying down \$10 billion to build the biggest wind farm in the world. Closer to home, the Bluewater Wind project, planned for the waters off Rehoboth Beach, Delaware, promises to generate up to two hundred megawatts as soon as 2012. Gov. O’Malley endorsed the project, which could stretch south along the coast to Ocean City. Several companies are now experimenting with “parapet turbines” that capture the updrafts at the tops of tall buildings and spin them into electricity. Galen Frazer’s digital dream of windmills atop Baltimore’s downtown skyline could someday come true.

Still, efficiency is going to be more than a passing fad. In the last five years, venture capitalists have poured some \$885 million into companies that promise to increase efficiency and upgrade the decrepit energy grid, according to Cleantech Indices, which tracks sustainable technology investment.

Down the road someplace, the electric power industry imagines a “smart grid”—a multi-billion-dollar overhaul of the electric grid that will allow utilities to micromanage the flow of electrons between power plants and consumers. Building the smart grid might mean big money for companies such as GE and IBM—that is, if neighborhood “micro-grids” powered by space-age technologies don’t make the whole idea obsolete.

Hopkins’ Bookhart says that in all likelihood, we have no idea what the fuel of the future is going to look like. “In twenty years, we could have this whole city completely powered by renewables like solar and biomass,” he says. “Or we could be powered in ways we have no idea about right now.” He posits a scenario in which we plug our houses into mini power plants under the hoods of our cars.

The future could indeed be wondrous. But meantime, we’re left to tinker and tighten. We’re left to make small changes in our homes and lives, our offices and our factories—the adjustments that will win no compliments, but that offer the best hope of bridging the void that we’re now staring down.

Ultimately, that may be the biggest challenge.

—*Greg Hanscom is Urbanite’s senior editor.*

WHERE DOES ENERGY COME FROM?

Coal is still king in Maryland, and nuclear his trusty atomic sidekick. Together, they generate 84 percent of the electricity that surges through this state, powering our laptops and TVs, our air conditioners and our microwave ovens. But what are the prospects for the future? Here's our best guess.

Coal

Today: Top Dog

Tomorrow: Coal power as we know it is on the way out in the United States, thanks to concerns about global warming (although China and India are building new coal plants at an astronomical rate). Proponents of "clean coal" technology insist there's a future for the black stuff, and it will likely be a player for years to come. But we predict that coal will be a fossil in our lifetimes.

Nuclear

Today: Sleeping Giant

Tomorrow: Nuclear has new legs right now, because it creates virtually no greenhouse gases. But it will continue to be dogged by safety concerns—and of course, the burning question: Where are we going to dump all the radioactive waste? (For the record, Nevada doesn't want it.)

Natural Gas

Today: Small Fry

Tomorrow: Experts agree that burning natural gas to produce electricity, while relatively clean, is not the best use for the stuff. It will no doubt continue to be a player—especially where it can be siphoned off from decomposing garbage and sewage sludge—but will be increasingly relegated for the jobs it does better, such as heating homes and fueling vehicles.

Wind

Today: Not Even the Time of Day

Tomorrow: Maryland is tied for last place in wind: There is currently not a single utility-scale wind farm spinning out electricity in the state. But there's potential. The wind blows strong on the high Appalachian ridges in Western Maryland, and there's a gold mine offshore, where windmills will soon be marching south from Delaware.

Solar

Today: An Interesting Hobby

Tomorrow: Solar power packs tremendous potential in Maryland, especially in Baltimore where a sea of tar rooftops just begs to be lined with photovoltaic

panels. Solar technology is presently doing the leaps-and-bounds that computer chips are known for, and new technology and innovative business models are finally bringing it within reach for everyday folks.

—G.H.

EFFICIENCY STARTS AT HOME

Greening your house can be an expensive undertaking. A rack of solar panels will set you back \$20,000 or \$30,000. Replacing those leaky single-pane windows might run another \$20,000. Then you've got to upgrade that old refrigerator and the decrepit hot water heater. Hmmm. Maybe next year.

Good news: Going green can be as cheap as a \$4 tube of caulk and a Saturday afternoon. Chances are your house is like a car with a leaky gas tank, says Frank Lee of TerraLogos. "Take a wad of chewing gum and stick it into the hole in your gas tank. That will cost ten cents," he says. Once you've patched the holes—and you'll find them in surprising places—then you can dream of solar panels. Here's a list of home-tightening projects that we've gleaned from Lee and a handful of others in the business:

1 Audit your house. Do a home energy inspection to identify leaks and figure out where your money is best spent. See www.mdhomeperformance.org for a list of certified contractors. If you don't have the \$350 to \$500 for a professional audit, download do-it-yourself guidelines from the U.S. Department of Energy (www.eere.energy.gov), or contact the city's Weatherization Assistance Program (410-396-3584).

2 Patch the holes. There's no point in upgrading to a new air conditioner if you're just pumping all the cool air out. Poke around in the basement and attic to inspect where pipes, wires, and ductwork punch through floors and ceilings. A little spray foam in the gaps will go a long way toward reducing drafts. Squeeze silicone caulk into the seams where your stairs meet the wall, which often provide a conduit through the wall to the basement. Weathersealing windows and doors helps, too.

3 Change your light bulbs. Yes, energy efficient compact fluorescent bulbs contain mercury, so handle with care. But experts say the bulbs are no more hazardous than the old fluorescents that have long been commonplace in schools and offices.

4 Pimp your appliances. Now is the time to look at replacing the AC, furnace, water heater, refrigerator, and washer and dryer. Technology has come a long way in the past decade; new Energy-Star-rated appliances suck significantly less

juice than the old ones. The power company can help by installing programmable thermostats, switches, and “smart meters” that cycle the heat or AC off during hours of peak demand.

5 Sweat the little things. Turn lights off and the heating and AC down when you don't need them. Unplug appliances or switch off power supplies when not in use; you'd be surprised how much current your TV and VCR suck even when turned off. Use a laundry line rather than your dryer. All these little things add up.

—*G.H.*