

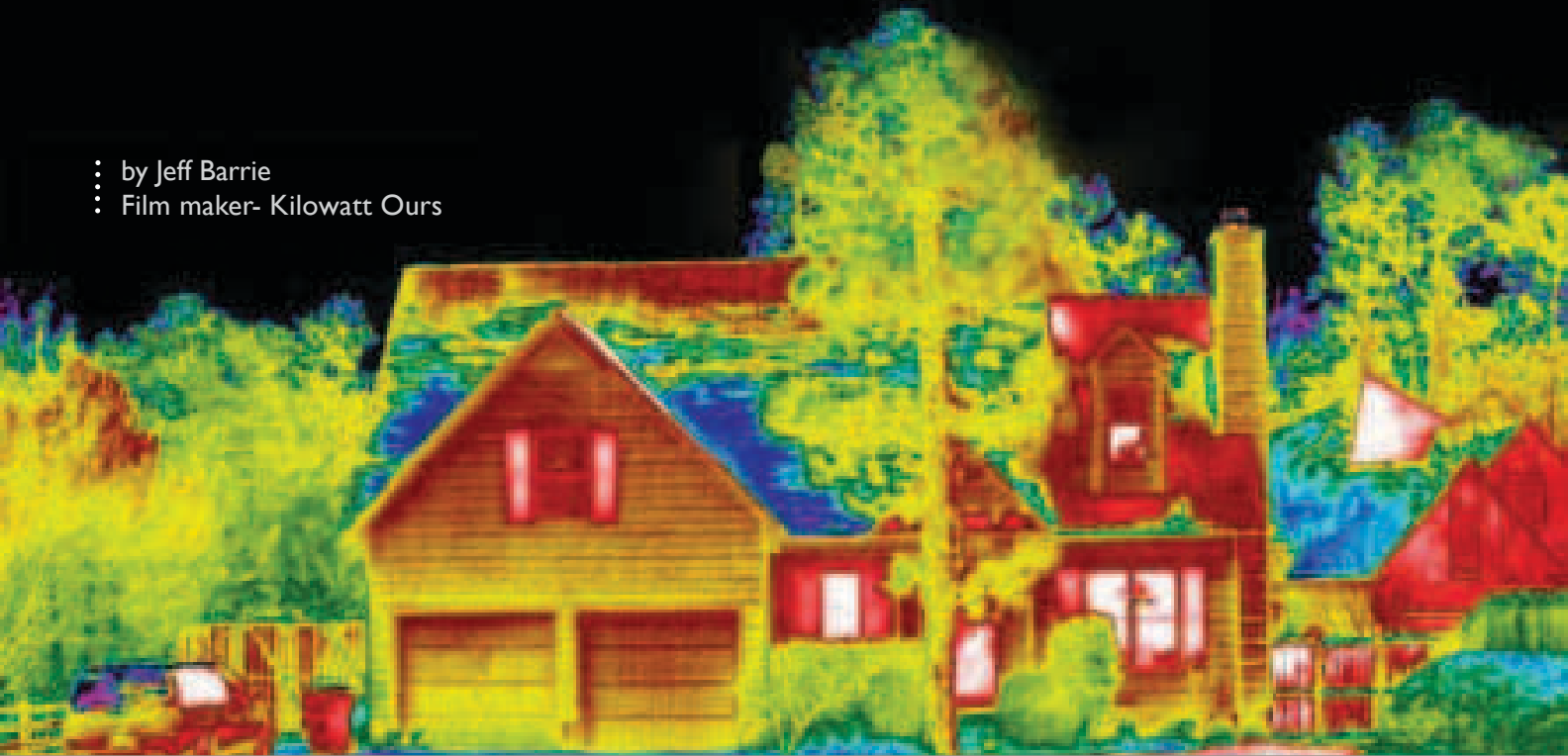
Building a Conservation Nation

What is the real potential of saving energy?

I love electricity. This may come as a surprise to those who have seen my documentary film *Kilowatt Ours*. But it's true. Electricity provides a powerful service to me, my family, and my work. This medium, as we experience it, is very clean. Its delivery to our light switches and outlets and appliances and electronics and toys is silent, instantaneous, seemingly magical.

The ostensibly clean, silent nature of electricity also contributes to the myth that it is free of negative consequences. So when people learn that mountains are being destroyed in the Appalachian region to generate power or that the 5.4-million-cubic-yard coal ash spill in Tennessee in 2008 was a direct consequence of generating electricity, the usual response is dismay, surprise, shock, and concern.

• by Jeff Barrie
• Film maker- *Kilowatt Ours*



Thermal imaging shows the loss of heat and energy from a poorly insulated house. Insufficient insulation is one of the biggest wastes of energy in the home.

Coal, Community Impacts, and Vanishing Mountains

There are two methods of mining coal: underground and surface mining (aka strip mining). Today, in the Appalachian region, more than 450 mountains encompassing an area estimated to be larger than 800 square miles, have been destroyed in an extreme form of strip mining. More than 7 percent of Appalachian forests have been cut down and more than 1,200 miles of streams across the region have been buried or polluted. Mountaintop removal mining, if it continues unabated, is projected to destroy more than 1.4 million acres by the end of the decade.

The process of mountain top removal causes extreme flooding events, air and water pollution, a loss of biodiversity and disruption for impoverished communities in the valleys. Julia "Judy" Bonds, coal activist, Goldman Environmental Prize winner and daughter of a coal miner, calls her communities of Southern Appalachia "America's sacrifice zone for cheap electricity." She and others have dedicated their life work to ending the destructive practice of mountain top removal.

America consumes more than 1 billion tons of coal annually, primarily for electric power. A single train carrying this much coal, would stretch across the U.S. from coast to coast and back, then around the world three times. The burning of coal for electricity is linked to acid rain, smog, global warming and toxic heavy metals circulating in the air we breathe. Furthermore, coal-burning power plants are one of the largest users of water worldwide. Water withdrawals to produce electricity make up approximately 48 percent of total water use annually.

Health Impacts of Burning Coal

Respiratory diseases in children and elderly are worsened by the pollution from coal-burning power plants.



Top: An expanse of the Appalachian Mountains untouched by mining companies.
Bottom: Another area of the mountains after being strip mined.

In recent years, scientists have shown that pollution from power plants is a major cause of asthma attacks and one in five Americans lives within 10 miles of a coal-fired power plant.

Mercury emissions from coal plants contaminate lakes and rivers. A recent U.S. Environmental Protection Agency study examined fish from more than 200 streams, rivers and lakes nationwide and found 100 percent of the fish were contaminated by unsafe levels.

of mercury. The consumption of fish with high-levels of mercury can cause brain damage and developmental disorders in unborn children.

Conserving Energy – Ways to Save

My definition of “energy conservation” is any act that reduces the amount of conventional energy used to maintain our lifestyles, conveniences and economic well-being. Conservation includes using energy-efficient technologies along with changing our behaviors and choices. I believe conservation is our greatest untapped, and readily available domestic energy supply. Today, we waste about the same amount of energy as we use so, we produce twice the amount that we actually use.

We made small changes. Our upfront investment was less than \$300. Our electricity bills dropped by half almost immediately.

Can power strips, efficient light bulbs and seemingly tiny choices such as turning off a light switch make a difference in solving the great energy challenges of our day? The evidence I found says “absolutely!” Our individual choices make all the difference. In the U.S., residential and commercial buildings consume 48 percent of all the energy used each day. This is a major source of the problem and, at the same time, a clear starting point for a workable solution. To confirm this, I needed proof. So, I made a documentary film about it.

Conservation in the Home

I started in my home. My wife and I changed all of our light bulbs to energy-saving compact fluorescents. We replaced our 1970s model energy-hogging fridge with a used energy-efficient model we found at a local appliance store. We turned off lights and electronics when not using them. We made small changes. Our upfront investment was less than \$300. Our electricity bills dropped by half immediately, begging the question, “What if every home in America were to implement these simple changes?” In my search for the answer, I discovered that I wasn’t the only one striving to conserve.

Energy-Efficient Renovations in Buildings: A Look at Schools

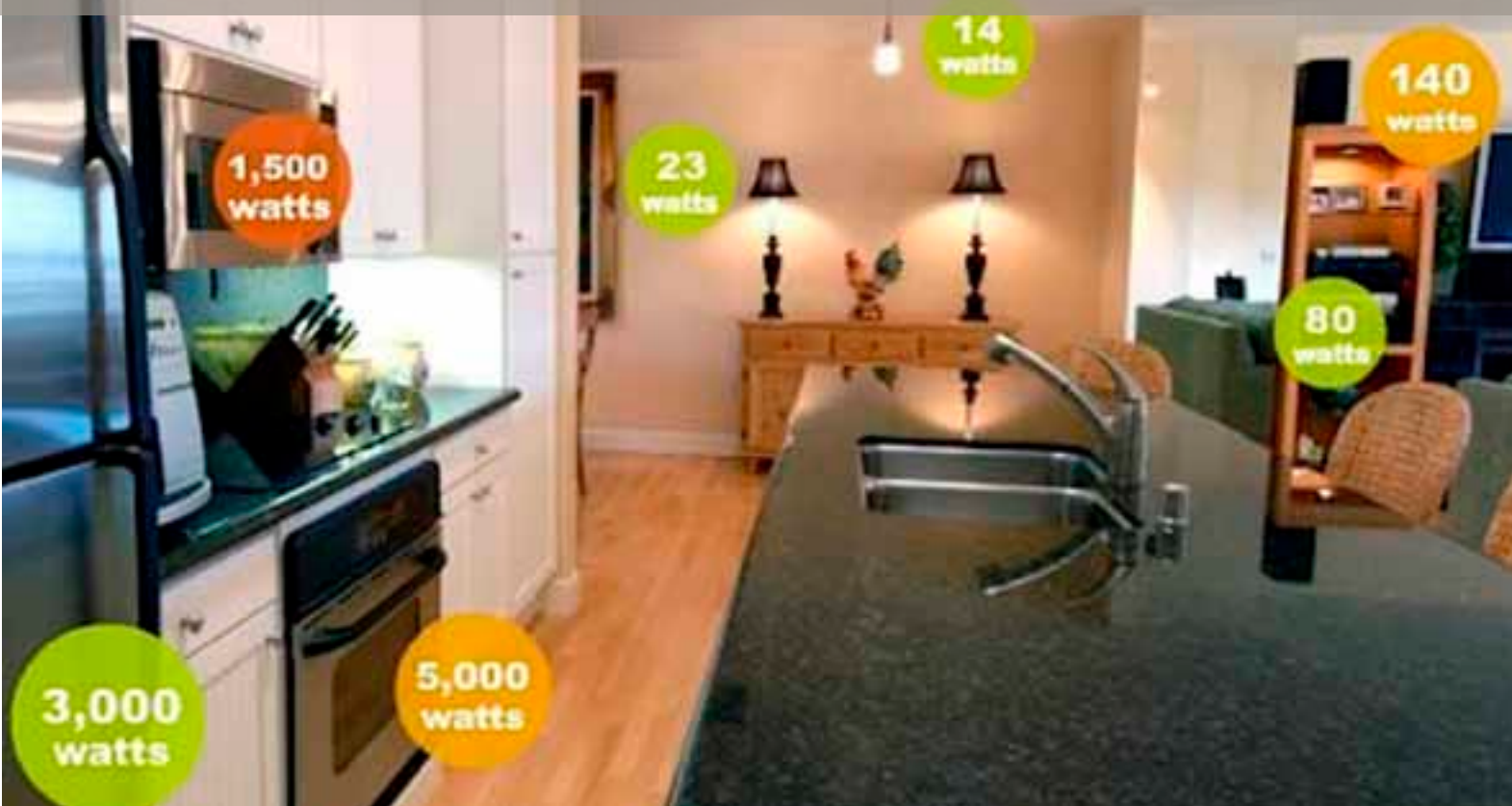
I canvassed our nation to find the true potential of energy conservation. One of the greatest examples I found was Sullivan County School District in rural East Tennessee. Beginning in 2001, school officials spent \$24 million to upgrade each of its 24 school and administration buildings with energy-saving measures and technologies. The magic of their program is that the hefty price tag was paid for over time with the savings from reduced operating costs, rather than paying for the project up front. In other words, instead of paying for wasted energy, Sullivan County is now using that money to pay for its new windows, lighting, boilers and chillers, and energy management systems.



Sullivan County School District in Tennessee spent \$24 million to upgrade its school and administration buildings with energy-saving measures and technologies, such as the solar panels above.

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Making small changes around the house, such as switching lightbulbs to compact fluorescents, turning off lights and electronics when not in use, and replacing energy wasting appliances are big steps toward conservation.



Currently Sullivan County School District is realizing a savings of 40 percent on power usage and costs, and nearly half of the up-front investment has been recouped. If one school district can do this, our entire nation of school buildings could do the same.

In addition to recovering project costs and reduced utility bills, investments in energy efficiency have other benefits as well. The non-profit Apollo Alliance estimates that a \$10 billion federal investment in energy-efficient retrofit and conservation programs would result, hundreds of thousands of jobs and fortunately this investment is part of the American Recovery and Reinvestment Act. and can reduce energy use in new and existing buildings by 30 percent .

City-wide Conservation

It’s one thing to see a small-scale example, but if we are to build a conservation nation, it must work on a large scale. My search for bigger examples of energy savings took me to Austin, Texas. Instead of building a new \$500 million coal-burning plant, the City created a “conservation power plant.” Implemented since the 1980s, the the energy conservation programs implemented by the City of Austin have eliminated more wasted energy than new demand, helped to create jobs, reduced energy costs, increased comfort in the built environment and all that coal remains in the mountains.



The Seaholm Power Plant, on the north side of Austin, Texas no longer generates power for the City. The city of Austin, instead of building another power plant, used money to improve efficiency of businesses, schools, apartment units and homes. The resulting savings exceeds the amount of power the new powerplant would have produced.

Austin Energy, the city-owned power company, used a portion of the money that was slated for the new coal plant to hire and train teams of inspectors to evaluate energy usage in businesses, schools, apartment units and homes. The energy inspectors found and repaired a wide variety of energy problems, including leaking duct work, inefficient lighting and appliances, poor insulation, and much more. Austin Energy provided rebates to its customers who upgraded their inefficient technologies (refrigerators, lighting, etc). Today, the city of Austin saves more than 700 megawatts of power each day, more than the output of one power plant. This exceeds the original power plant which would have provided 500 megawatts daily at best. They actually built a “conservation power-plant!” Imagine if the Austin model was repeated in every city, town and community so that there was a “conservation power-plant” worth of energy savings in every American city.

demands of a booming population and economy. The state’s leaders had a choice: Build new power plants or cut energy usage. The state government chose to conserve its way out of the crisis calling upon all citizens and businesses to do their part to reduce energy use. Through little more than widespread public education and incentives for energy conservation choices and behaviors, the state saved more than 5,500 megawatts of power that summer, or the equivalent of 10 power plants. Exemplifying the power of our small acts, 84 percent of the energy saved in California came from simple behavioral modifications such as turning off lights, unplugging electronics, and adjusting thermostats. This offers more proof that conservation is a powerful resource, and abundant. The crisis was avoided without a single new power plant. I believe that a sustained education campaign on a national level can have similar results for America, and our globe, much faster than many would believe possible.

A law of action states “in crafting a solution to any problem, the simplest answer of least expense is the best one to adopt first.” Conservation ought to be the

California Averts Energy Crisis with Conservation

In 2001, California faced massive power shortages, The supply of new energy had not kept pace with the

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top priority, and when we’ve exhausted all energy-saving opportunities, eliminated all the wasted energy we can reach, then, and only then it is time to invest in risky, capital-intensive new power plants. When we all dream, believe, then act, the world can change with the flip of a switch, to a degree greater than many believe is possible in the current reality. My dream is a nation where energy conservation is the centerpiece of our energy policy, all the way down to the individual choices each of us makes. If one household can, then all households can. If one school district can, then all schools can. If one city can, then every city can. If one state can, then so can a nation. Our nation will be strengthened as we become responsible stewards of the abundant energy resources available to us.

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TOP 6 steps to conserve

- 1 Replace the 5 most used lightbulbs with compact fluorescent bulbs **SAVE \$ 90/yr** **Lbs coal 662 lbs**
- 2 Plug into power strips and turn them off when not in use **\$95/yr** **720 lbs**
- 3 Set hot water heater to 120° and use low-flow showerhead **\$40/yr** **225 lbs**
- 4 Adjust the thermostat to 68° in winter and 78° in summer **\$115/yr** **864 lbs**
- 5 Weatherize and seal windows, doors, air ducts, etc **\$260/yr** **1,872 lbs**
- 6 Use a portion of your savings to pay for green power **\$\$\$\$\$\$** **1,800 lbs**

Jeff Barrie has been producing independent documentary films since 1993, films that show how we are all part of the solution to environmental challenges. His latest film and non-profit project Kilowatt Ours features an award-winning documentary film, a curriculum for K-12 schools, and a new energy savings workshop series for low-income communities in partnership with NES (Nashville Electric Service). Jeff is working on a new film project called “Pedaling a Dream” which he hopes will motivate more people to become involved in creating the clean, green world of our dreams. Jeff lives in Nashville with his wife and co-star of Kilowatt Ours, Heather, and their four year old daughter Lily.

