

TVA Testimony,

Good afternoon Mr. Chairman and members of the board. I am Jeff Barrie, creator of the documentary film Kilowatt Ours (that's "hours" without the "h"), and founder of the Kilowatt Ours non-profit initiative based in Nashville. I am honored and thrilled to be here. Thank you for the opportunity to share a vision with you; a vision for TVA and for the economy and the people of the Tennessee Valley. And thank you for taking leadership towards energy conservation.

The title of my talk is "take a load off."

As you know, the Tennessee Valley ranks among the nation's top consumers of electricity. Per capita residential usage in this region is highest in the nation, as is the usage of coal to generate that electricity. I believe we can go from leaders in consumption to leaders in conservation. TVA's target of 1200 MW of conservation by 2013 is a wonderful step in that direction. Once this pilot period has resulted in success, I look forward to ramping up conservation programs to come closer to meeting all future demand growth. One of the best indicators of success in this endeavor is the per capita usage. When that begins to level off instead of growing, we will know we've succeeded.

It takes about 1 pound of coal for TVA to provide a home with 1 kilowatt hour of electricity today.ⁱ The average home in Tennessee consumes more than 1,300 KWH per monthⁱⁱ, or 7.5 tons of coal per year. The environmental side effects include mountain top removal coal mining, haze pollution in the smokies, global warming, respiratory diseases in children and the elderly, mercury contamination in our waters leading to developmental problems in children.

Now, let me talk about solutions. I will use my time to offer several key recommendations for TVA to consider in this conservation plan. I will start with my most challenging notion.

I propose that TVA adopt a policy that phases out the purchase of coal from mountain top removal operations in Southern Appalachia, and replace those BTUs with robust efficiency, conservation and green power programs. I offer to bring a group of coal-field representatives to meet with you to hear their stories, and why this ought to be a priority.

Conserving one kilowatt hour saves one pound of coal, which in turn keeps 1.5 pounds of carbon dioxide out of the air. Every megawatt hour saved prevents 8 pounds of sulfur dioxide and 4 pounds of nitrogen dioxide, and a small amount mercury from going into the air.ⁱⁱⁱ In short, conservation is the quickest, cheapest way to clean up the environment, and to meet future load growth. It out performs all other generation sources and conservation ought to be TVA's highest priority. I don't believe that new nuclear plants are the solution. Those resources would be more effective if invested in demand side programs.

What does it take to save kilowatts? Our organization is most concerned with the millions of existing homes and buildings in this region. Primarily the residential sector.

We hear a lot about these, compact fluorescent light bulbs which consume ¼ the energy of a standard incandescent, and save 547 kilowatt hours or 547 pounds of coal in 5 years of use (assuming 4 hours of use per day, 365 days per year and 75 watts of savings for an equivalent 100 watt replacement bulb). Multiply that by 2.6 million households in Tennessee alone^{iv}, and that is a big impact. It's a good start. Let's not forget to establish a network of bulb recycling centers across the Valley, so the small amount of mercury in these bulbs does not enter the environment.

This is mastik. It is the best compound for sealing air ductwork in homes. According to EPA, the average home leaks about 20% of its heating and cooling energy through leaking duct work.^v In the Tennessee Valley, that adds up to billions of KWH wasted annually. Huge environmental consequences from energy waste that benefits nobody. The workforce is already in place to seal those leaking ducts – name one town that doesn't have a cadre of HVAC service companies listed in their local yellow pages – and with some simple training on how to use this stuff (mastik) to seal ducts, we could cut that waste in half or more. That's \$100 a year savings for the average home not to mention billions of pounds of coal saved. Broad duct-sealing efforts ought to be included in your plan.

This is a job-creating program. A boost to our economy. In small towns and big cities. There is a company in Nashville called Metrolight, which produces this smart energy efficient ballast for HID lighting (High Intensity Discharge). For example, street lights. Simply put, this technology cuts energy use in street lighting by 65% and doubles the life expectancy of the bulb.^{vi} How about putting these in all fixtures in the Tennessee Valley? Enormous savings potential. LP corporation in Nashville manufactures this radiant barrier technology that keeps homes cooler in summer and warmer in winter, cutting heating and cooling costs 17%.^{vii}

There are all sorts of companies in the valley that have the skills and expertise to do the work. Home Energy Concepts in McMinnville Tennessee already has a trained network of home energy raters throughout this region.^{viii} Once the home has a rating, the work may be financed by offering energy improvement mortgages every time a home is sold in the Valley. TVA can partner with the Realtors' association to make this happen. Georgia power is piloting a program in Savannah to train home inspectors to conduct energy assessments at point of sale, and offer efficiency improvements, rolling the cost into the mortgage.^{ix} The costs of the improvements may be recouped and then some by the savings on the monthly power bill.

Some other suggestions: Improve the TVA website to become a central clearinghouse to find local contractors, products and services and other resources for consumers. TVA could partner with retailers to offer in-store displays and workshops.

My expertise is in educating the public – how do we craft a message that motivates consumers to care, and participate? To me it is simple. Tell the truth. I am a big believer that when people are aware, they make better choices. Here are a couple examples: In Seattle, the US Energy Department launched a pilot program putting time of day pricing controls in the hands of homeowners and usage dropped 15%.^x Awareness leads to conservation.

A research study by Virginia Tech, demonstrated that simply showing consumers a television program about energy conservation resulted in a 17% reduction in usage in the study group.^{xi} I have seen the same thing happen countless times after screenings of my film Kilowatt Ours.

We have a curriculum that teaches students how to read their electric meters and save energy. Getting programs like this into the schools is a key ingredient of success. There is a company in Chicago called CFLs for Kids that offers energy efficient lights and other products as a fundraiser for schools.^{xii} Let's educate and mobilize our youth to get involved. I believe that technological fixes must be coupled with behavioral changes for long-term results.

My organization is developing a pilot program to make Nashville a model energy efficient community, similar to Austin, Texas. As you know, Austin now saves 600 MW per day city-wide. Having a city-scale success in our region would be a compelling model for other cities.

One of the most cost effective load reducers is solar thermal. It is one of the greatest untapped renewable energy sources in the valley. In your action plan, I urge you to include a solar hot water program for the Tennessee Valley. TVA can become a leader in distributed generation, built on a foundation of efficiency and conservation.

In summary, my key recommendations are to:

- 1) work towards meeting all future load growth with demand side management
- 2) phase out the use of MTR coal and replace with conservation/efficiency/green power
- 3) make conservation highest energy priority
- 4) establish a network of bulb recycling centers
- 5) include duct-sealing program
- 6) Partner with locally-based companies and retailers
- 7) Promote energy improvement mortgages
- 8) TVA website as a clearinghouse
- 9) real time power monitoring and time of day pricing
- 10) use television-based educational programming
- 11) target schools and youth
- 12) create model energy efficient community (Nashville)
- 13) promote solar thermal, distributed generation

TVA has a history of pushing the envelope with a bold mission of economic development in this region. Let's re-invigorate that mission, and continue working together to train a new workforce and build a new economy around re-electrifying the south with the cleanest sources of power available.

ⁱ Interview with physicist David Reister, April 4, 2004: "DOE has estimates of the energy content of coal used by the electric power sector from 1949 to 2003. In 1950, the number was about 24 million BTU/Short Ton. Currently the number is about 20 million BTU/Short Ton. A Short Ton is 2000 pounds. Thus, the national average value of a pound of coal used by the electric power sector is about 10,000 BTU/pound. In 1970, the heat rate for fossil fuel electricity was 10,494 BTU/KWH. In 2003, the heat rate is 10,107 BTU/KWH. Thus, one pound/KWH is a good number. The heat value of electricity is 3412 BTU/KWH. Thus, 10,107 BTU make 3412 BTU of electricity; an efficiency of 34%. If better technology was used and coal had a 50% efficiency, the number would be 0.68 pounds of coal/KWH.

ⁱⁱ Data below was provided by TVA for fiscal years 2006 and 2007: Below are kwh use numbers by state for the TVA service territory for TVA fiscal years 2006 and 2007. This should give you an idea of what residential use is doing. These numbers are not weather-adjusted, meaning this data does not take into account differences in heating and cooling degree days between the two years. Hope this information helps. This data came from the numbers we use to do our state fact sheets. They are based on total residential kwh by state divided by the total number of residential meters by state.

FY 2006	Annual Average (kwh)	Monthly Average (kwh)
Alabama	16,792	1,399
Georgia	15,650	1,304
Kentucky	14,038	1,170
Mississippi	15,886	1,324
North Carolina	11,111	926
Tennessee	15,863	1,322
Virginia	13,986	1,166
FY 2007		
Alabama	16,707	1,392
Georgia	15,933	1,328
Kentucky	14,720	1,227
Mississippi	15,738	1,311
North Carolina	11,241	937
Tennessee	16,096	1,341
Virginia	14,352	1,196

Percent Change (FY07 versus FY06)

Alabama	-0.51%
Georgia	1.81%
Kentucky	4.86%
Mississippi	-0.93%
North Carolina	1.17%
Tennessee	1.47%
Virginia	2.62%
Total	1.41%

ⁱⁱⁱ CO2 per kwh: approximately 2 pounds per kwh (Source: The Cadmus Group, Inc. Regional Electricity Emission Factors Final Report, The Cadmus Group, Inc., 1998, Exhibit 6.); NOX per megawatt hour: 4.28 (round to 4) (Source: Emissions and Generation Integrated database – E-GRID – EPA/Acid Rain Program); SOX per megawatt hour: 7.79 (round to 8) (Source: Emissions and Generation Integrated database – E-GRID – EPA/Acid Rain Program).

^{iv} www.tva.gov

^v http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_ducts

^{vi} conversation with Jason Rappaport, MetroLight Account Director. Contact: 615 261 8841 or jasonr@metrolight.com, www.metrolight.com

^{vii} from LP website: <http://www.lpcorp.com/radiantbarrier/radiantbarrier.aspx> Contact: Bob Palardy, Director of Research and Development, Franklin, TN (615) 656 2210, bob.palardy@lpcorp.com

^{viii} Phone interview with Jerry Lyle, Home Energy Concepts, (931) 668 7277, hec-tn@charter.net, www.homeenergyconcepts.com

^{ix} Email from Leonard Haynes, Southern Company. Contact: Dean Harless, Georgia Power Company, phone: 404-506-1468, fax: 404-506-7589, email: ldharles@southernco.com

^x A yearlong study from the Energy Department, released on Wednesday, shows that giving people the tools to monitor their energy usage turns out to be a powerful way to encourage conservation. After providing 112 households in Seattle with digital thermometers and computer controlled, Internet-based ways to adjust their energy usage, the researchers found that homeowners were inspired to reduce their consumption significantly. Source: <http://www.enn.com/business/article/29089>

^{xi} Winett, R.A. Leckliter, I.N., Chinn, D.E., Stahl, B., and Love, S.Q. (1985). Effects of Television Modeling on Residential Energy Conservation. *Journal of Applied Behavior Analysis*, 18, 33-44. Contact: Richard Winette rswinett@vt.edu.

^{xii} www.cflsforkids.com