

**Testimony to TVA Board of Directors  
Renewable Energy Strategies  
Public Listening Session  
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My name is Mark Downing, and I am Senior Research Scientist and Agricultural Economist at Oak Ridge National Laboratory. The ORNL Bioenergy Program provides support to the U.S. Department of Energy's Office of the Biomass Program. ORNL is managed for the Department of Energy by UT-Battelle.

Mr. Chairman, and members of the Board of the Tennessee Valley Authority, thank you for the opportunity to address your interest in developing renewable energy strategies for the 276 county TVA region. I am honored to be here this morning.

The TVA has a rich and diversified history in the region and has enabled a population to develop and prosper in lifestyle, continued tradition, and in commerce. It is this abundant lifestyle and diversification of opportunity I wish to expand on in the next few minutes.

It is possible that many people see the TVA as a provider of coal-fired, nuclear, hydro, and wind electric power for the Valley. This narrow view fails to describe the potential advantages of TVA as an energy provider in a broader sense, and a recreation provider and steward of land and water resources in a large portion of the southeast U.S. The fact is, TVA, along with many other federal, state, and local entities cooperatively provide a vast array of goods, services, and other benefits to Valley residents. Some of these benefits are clearly measured with value accruing in the marketplace, while bestowing other more hard-to-measure non-market values such as environmental benefits.

The U.S. Department of Energy along with Oak Ridge National Laboratory are exploring many energy options in the U.S. There are energy initiatives in nuclear, renewable energy, clean coal, and renewable fuels, to name a few. These strategies are an attempt to provide secure, agile, flexible, and diverse energy options. Renewable energy is only part of the package, but shows promise in providing environmental benefits and energy security. I make the case that any of a number of renewable energy options are better than none, because these strategies permit TN and surrounding states to diversity their portfolio of energy provision. We have developed a really prosperous economy based on oil, gas, and coal. And there are several strong indications that continued reliance solely on these resources may not let us achieve the long term potential growth, development, and sustained level of prosperity we are accustomed to.

Just as we diversity our personal investment portfolios, TVA has wisely chosen to diversify its energy production sources. Benefits are derived from coal, hydro, wind, and methane production of energy. But there is more. The TVA region is rich with productive land, and many agricultural and forestry resources. To pursue a truly renewable energy strategy in concert with our non-renewable profile, it is valuable for this region to contribute its part of a national renewable energy strategy. There are costs and benefits of

doing so in a dynamic economy. There are costs because it is a misnomer to consider any renewable energy source or strategy to be without cost, or as business as usual. There are benefits as well, and it is the balance of these costs and benefits over the status quo or other alternatives that TVA must evaluate. There are risks, even with hydro, especially noted after a drought in the southeast that continues. Drought will affect renewable energy strategies as it affects agriculture and forestry, so no options are without risk of some degree. It is diversification with an understanding of risk and risk management strategies that will assist TVA to continue providing diverse energy sources to the Valley.

I have been a part of and watched with a great deal of interest the pursuit of renewable energy strategies at the state and federal level. There has been great and heated debate regarding the pros and cons of a renewable portfolio standard, a renewable fuels standard, or a combination of the two. This debate is likely to continue for quite some time with regard to relative costs and benefits and to whom these costs and benefits accrue. Members of commerce enjoying profits in current markets will feel threatened, and others will find opportunities in agricultural, forestry, and other new technological advancements in renewable energy currently being researched, demonstrated, and deployed. This is an opportunity for 276 counties that TVA should take comparative advantage of. I speak specifically of several options for co-firing available biomass resources with coal in existing facilities which may serve to alleviate forest fire threat, increase the value of underutilized forest materials not currently demanded in other markets, and to decrease a level of landfilling of separated municipal solid waste which many find objectionable. It is an opportunity to appropriately evaluate land use options in the Valley to continue to provide food, feed, fiber, and fuel from our rich land resource in a manner that is compatible with appropriate environmental stewardship.

The worldwide energy community is sensing a great deal of excitement in anticipation of exploring many different fuels and power options. The Department of Energy is investing heavily in renewable energy science, research, and technology deployment to support industrial development by buying down the risk of investment in these new technologies. More than a dozen years ago, TVA invested resources to understand the opportunity for procuring biomass feedstocks in the Valley to co-fire in some of their existing coal-fired power plants. Co-firing is no longer research; it is proven technology waiting for adoption and adaptation. Many power plants in this country currently co-fire, or are even dedicated biomass power plants. Even a dozen years ago, TVA saw the wisdom in diversification. But diversification means nuclear, solar, wind, landfill methane, biomass-derived power, and many other options. The Energy Independence and Security Act of 2007, part of H.R. 6, provides for capturing renewable energy benefits from biomass power plants providing energy to biorefinery industries that produce renewable fuels.

Renewable energy is only part of the answer to a diversified energy portfolio. There are two parts of the story. The first is that renewable energy doesn't happen without cooperation and collaboration from other federal, state, and local agencies. It doesn't happen without private industry and private capital investment. In every part of the country where renewable energy solutions are being used, there is multi-jurisdictional and multi-agency cooperation. There is cooperation between federal agricultural and

forestry policy, and there are benefits to landowners, and rate-payers alike. And if you subscribe to some level of understanding of some level of changing local or global climate, there is not time to argue over how fast or how slow things are changing – just a cooperative and collaborative recognition that not only will renewable energy have an effect on this change, and the rate of change, but that global or local climate change will have an effect on agricultural, forestry, and markets for biomass derived material.

But I've still only relayed half the story. The other half is energy efficiency. Energy efficiency is not reduced to a discussion of cost at the gas pump, or cents per kilowatt hour. It's not a discussion about lowering your thermostats in the winter and raising them in the summer. It's about providing energy efficient alternatives in housing design and materials, about efficiency and availability of appliances, and if we think of plugging electric automobiles into the grid, it is about making them more efficient as well.

TVA has spent years thinking about power choices, recreational opportunities for people, land use benefits and opportunities for change. I submit to you that these options and opportunities should be made in concert with both demanders and suppliers of all these goods, services and opportunities. The State of Tennessee is investing heavily in the TN Biofuels Initiative. I believe other neighboring states are paying attention and may follow Tennessee's lead. This is important because not only do Tennesseans benefit, but the environmental choices Tennessee makes affect the environments of these neighboring states. And the commerce of neighboring states will benefit as well. Diversification of energy strategies in other states will also benefit the TVA region. The University of Tennessee, Oak Ridge National Laboratory, and many federal, state and local agencies and organizations are poised to assist you in your endeavors to design several near- mid- and long-term strategies providing multiple benefits to the southeast U.S. through renewable energy options.

Thank you very much for your time.