



STATEMENT BY JEFFREY HARRIS, ALLIANCE TO SAVE ENERGY
TVA Board of Director's Public Listening Session on
Energy Efficiency and Demand Response
Knoxville, TN – March 4, 2008

Thank you for the opportunity to address the TVA Board this afternoon. My name is Jeffrey Harris; I am the Vice President for Programs at the Alliance to Save Energy. Last year, the Alliance celebrated our 30th anniversary as a nonprofit coalition of more than 145 business, government, environmental and consumer leaders. Under the leadership of Senator Mark Pryor as Chair and Duke Energy CEO James Rogers as Co-Chair, the Alliance's mission is to advance energy efficiency worldwide in order to achieve a healthier economy, a cleaner environment, and greater energy security.

The Alliance to Save Energy is also a co-founder of the Southeast Energy Efficiency Alliance (SEEA). SEEA, in less than two years, has brought together more than 25 business, government, utility, and advocacy organizations to support energy efficiency in 11 southeastern states. The Tennessee Valley Authority is represented on the SEEA Board of Directors by Vice President Joe Hoagland. One of the latest SEEA initiatives, co-led by Florida Governor Crist and Tennessee Governor Bredesen, is helping to forge a coalition among the region's governors to advance energy efficiency policies and programs in the Southeast.

Today the Alliance to Save Energy is pleased to provide comments to help TVA develop and implement a new long-term energy efficiency strategy, building on your experience with *energy right*®, load management, and other demand-side programs. My comments will cover 3 topics:

- 1) Setting clear goals and tracking progress;
- 2) Program development; and
- 3) Program measurement and evaluation

My written remarks provide detailed references, websites, and 1-page summaries of several programs I will mention.

Setting Goals and Tracking Progress

Faced with the pressures of rising and increasingly volatile fuel prices, multiple low-hydro years, and regional economic growth that drives the demand for electricity, TVA forecasts a need for 6 to 12 GW of increased system capacity over the next 10-15 years. With an announced emphasis on energy efficiency to help meet demand growth, TVA has adopted an interim goal of saving about 64 MW in 2008 from current efficiency programs and new pilot efforts, and at least 1200 MW or more in the next 5 years. TVA is also conducting a market potential study to help identify opportunities for efficiency, conservation, and peak load management.

Although the results of the market potential study are not yet available, we recommend that TVA set an aggressive planning target for **energy efficiency and demand management to offset at least half of anticipated energy and peak load growth** over a 10-20 year period. Based on last summer's system peak load of 33,480 MW, and a projected growth rate of 1.9-2.0%/year, this would mean a savings goal of about 3500 MW systemwide in 10 years.

Realistically, it will take time to design and ramp up new demand-side management (DSM) programs, so in the early years an annual goal somewhat lower than 1% of sales (i.e., half of the projected 2% annual growth) may be more realistic. On the other hand, if the target after 5 years is 1200 MW, then the pace of savings will have to be doubled in the following 5 years in order to reach 3500 MW of savings by year 10.

While these numbers focus on peak demand, a comparable effort also should be made to cut the growth rate in kWh electricity sales in half, in order to address the affordability and environmental challenges facing the region's ratepayers, as well as the looming challenge of global climate change.

A goal of 1% annual energy efficiency savings is challenging but achievable. It is also the *minimum* goal that will allow TVA to take its place among energy efficiency leaders in the region and nationally. A number of states are already pursuing savings goals of 1%/year or more.¹ Proposed federal legislation for a national "energy efficiency resource standard" (EERS) includes an annual energy efficiency goal of 1% of sales. And the SEEA Board is proposing a goal to offset half of the Southeast region's projected load growth (now growing about 2%/year) through energy efficiency and conservation.

While an effective program must start with clear and aggressive energy savings goals, it is equally important to assign responsibility for tracking progress and provide adequate resources for measurement and evaluation – a topic I will mention later.

Program Development

The current programs described on TVA's website include:

- *energy right*®, offering a free home energy audit and a kit of low-cost retrofit items;
- builder incentives for energy efficient new homes;
- low-interest loans for heat pumps;
- technical advice and ESCO project financing for commercial and industrial customers; and
- direct load control for residential water heating and peak load management for larger customers.

TVA is also pursuing several pilot programs, including:

- in-home energy audits with retrofit incentives;
- residential time-of-use rates;
- commercial and industrial lighting retrofit incentives; and
- demand-response incentives for commercial and small industrial customers.

These are all familiar and well-tested programs which can be expanded and improved based on experience, even as new program ideas emerge from the market potentials study. We urge TVA also to draw on the DSM experience of many other utilities around the country, through your

¹ Pew Center, "[States with Energy Efficiency Resource Standards.](#)" Kushler, M. et al. 2005. "[Five Years In: An Examination of the First Half-Decade of Public Benefits Energy Efficiency Policies.](#)" York and Kushler. 2005. "[ACEEE's 3rd National Scorecard on Utility and Public Benefits Energy Efficiency Programs: A National Review and Update of State-Level Activity.](#)"

involvement in the Consortium for Energy Efficiency, participation in events such as the upcoming [Symposium on Market Transformation](#) (3/30 - 4/1/08), the [International Energy Program Evaluation Conference](#), and the bi-annual [ACEEE summer studies](#) on energy efficiency in buildings and industry – along with ongoing review of the growing literature on best practice utility DSM programs.²

For today’s purposes, I would like to emphasize a few points that TVA might consider as you begin to broaden the program portfolio:

- *New construction, both residential and commercial, is a primary contributor to load growth.* TVA’s customers will have to live for decades – for better or worse – with the decisions made by today’s architects and builders. A priority for TVA and the region is to make sure that every new building is much more energy-efficient than today’s current practice – as well as “peak-load friendly.” Strong building energy codes are a start, and yet several states in the region lag behind in both adoption of current model energy codes and in a commitment of adequate resources for code compliance.³ TVA and its distribution utilities can be outspoken advocates for every state in the region to adopt and enforce the latest IECC and ASHRAE model energy codes, and to automatically update state codes whenever the national model codes change.⁴ In addition, TVA and the other utilities can contribute to effective code compliance by sponsoring energy code training and assistance to builders and code officials. Even better would be to combine code compliance with above-code design assistance and incentives.

For above-code programs, we recommend that TVA continue to coordinate its program with ENERGY STAR Homes, and establish the same minimum efficiency levels (30% beyond current code) that Congress has mandated for TVA’s own construction and renovation as a federal agency.⁵ To meet the compelling needs of peak load growth in the region, TVA should also push for ENERGY STAR compliant designs that reduce the peak electric demand of new homes (and commercial buildings). “Builder option packages” that focus on efficient windows, ducts, insulation, roof, and air sealing will help reduce cooling loads, allowing the air conditioner to be downsized (right-sized!) from 4 kW to 3 kW, for example, while still keeping the home comfortably cool.⁶ This is a much more effective way to achieve *permanent* peak savings, compared with installing a larger air conditioner and then hoping to achieve a diversified average savings of 1 kW/home during peak hours, with AC cycling switches. For new commercial buildings, guidelines for above-code design of high-performance buildings are available from many sources, including the ASHRAE [Advanced Energy Design Guides](#), ASHRAE [Green Building Standard 189](#), and the New Buildings Institute’s [Advanced Core Performance Guide](#).

² For example, see the recent ACEEE report, “[Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S.](#)” (2/08).

³ For more information, see the [Building Codes Assistance Project](#) (BCAP) website.

⁴ See, for example, the proposed changes in the residential model code advocated by the [Energy Efficient Codes Coalition](#) (EECC).

⁵ This would mean dropping the energy right “Gold” level (15% beyond code) in favor of the “Platinum” level (30% beyond code).

⁶ See, for example, the attached Efficient Windows Collaborative fact sheet on “Selecting Energy Efficient Windows in Tennessee.”

Creative use of rate design and new customer hookup fees – perhaps combined with rebates (i.e., “feebates”) – is another way to draw the attention of builders and buyers to low-energy, low-peak, and high-performance design and equipment choices. One way or another, TVA and its distribution utilities should make every effort to avoid connecting a new facility that does not, at a minimum, demonstrate compliance with the energy code.

And effective new construction programs should always include incentives for start-up commissioning and attention to long-term performance assurance through monitoring, benchmarking, and good operating and maintenance (O&M) practices by trained and motivated facility operators.

- While new construction programs are important to avoid the “lost-opportunities” which will last for a third or even a half century, we also need to find new ways to achieve substantial energy savings in the existing building stock. Conventional approaches such as energy audits, financing of energy-saving retrofits, and rebates for ENERGY STAR and other efficient appliances and lighting, are generally worthwhile and should be expanded. Further energy-saving opportunities can be piggybacked on the capital investments made for other reasons. For example, the “Home Remodeling with ENERGY STAR” program works with utilities and local contractors to build in energy efficiency to remodeling projects.

TVA should consider each and every equipment replacement as an opportunity for an efficiency upgrade. The same applies to replacement of windows and roofs, kitchen remodels, office building renovations, and the refurbishing of hotel rooms or a restaurant kitchen.

- As TVA programs evolve in the future, one model to consider is the provision of *comprehensive efficiency services* for homes and small commercial customers. These include not only energy audits and periodic check-ups, but also:
 - o timely equipment replacement with installation quality assurance, strong warranties, and on-bill financing (or leasing);
 - o similar financing for envelope retrofits; and
 - o “bounties” for retirement of second refrigerators and other excess equipment.

For larger commercial and industrial customers, many utilities find it useful to combine specified rebates with an option of custom incentives, and “standard offers” to pay for saved kWh. Finally, there may be opportunities for TVA to collaborate with the US Department of Energy in adding a regional focus to the DOE “Save Energy Now” [industry assessments](#).

- *Utilities and government agencies need to continue and intensify their “leadership by example,” and make their own examples even more visible.* As a federal agency, TVA is already taking steps to improve the energy efficiency of its own facilities and operations, including the Chattanooga Office Complex (COC) showcase described in the 2006 TVA Annual Report on Federal Energy Management – but Congress continues to raise the bar. The 2005 Energy Policy Act called on all new federal buildings to be 30% more energy-efficient than the current model code, and the latest 2007 Energy Independence and Security Act creates a new set of targets for existing federal buildings (3% savings per year) and for

new construction and renovation (beginning with 55% savings in fossil fuel use in 2010, compared with a similar building in 2003).

TVA can build on these efforts, working with state and local government agencies to help them institute similar policies for energy efficiency leadership. Collaborating on energy-efficient purchasing, for example – now mandated for TVA and other federal agencies – has the potential to create a “green buyers’ market” throughout the region, encouraging distributors and retailers to shift their stocking practices so that the inefficient model, not the efficient one, will become a more costly “special order.”

Even beyond making today’s best-practice the standard practice of tomorrow, *continuing to achieve large savings will require TVA to actively pursue new technologies and practices.* Building on its Research and Technology Applications (R&TA) Program, TVA can work with other utilities, universities and research organizations (like Oak Ridge National Laboratory), and public agencies in the region to field-test new technologies, document what works (and what does not), and help create entry-markets for promising new technologies as well as innovative practices like blower-door testing, duct-sealing, and continuous commissioning.

In addition to efficient end-use technologies, increased emphasis on “smart-grid” concepts for both sides of the meter can potentially pay big dividends. For example, imagine if every new fluorescent ballast were dimmable, with a wireless communications chip and its own IP address. This would allow individual employees to adjust their own lighting levels from their keyboard, while also providing a common platform for daylighting and occupancy control, reducing the 10% over-lighting used to compensate for lumen depreciation, and creating a huge resource for demand-response and even a demand-side alternative to spinning reserve.

- As important as it is to measure program performance, many things worth doing are not easy to measure. TVA and utility investments in near-term “DSM resource acquisition” should be complemented by *longer-term investments in the customer knowledge-base, the infrastructure to deliver energy-efficient products and practices, and “upstream” partnering to achieve market transformation.* Examples include:
 - o Broad-based public information campaigns to educate today’s consumers about the energy they use, the economic benefits of energy efficiency, and how their decisions relate to societal issues such as global warming, resource depletion, grid reliability, and energy security.
 - o Use of real-time metering technologies as well as the monthly billing process to provide customers with feedback that helps them track their energy use over time and compare it with suitable benchmarks.
 - o Energy-efficiency workforce development, such as partnering with vocational schools and community colleges to train and certify more home energy auditors, facility operators, commissioning agents, and construction workers and HVAC installers to help them apply best-practice quality assurance.

- Equally important, we need to think about the best way to create a strong energy-efficiency knowledge base for tomorrow’s consumers – in other words, the students now in grades K-12 as well as those enrolled in colleges and universities. As have other organizations, the Alliance to Save Energy has developed and widely tested our own model for K-12 and university level energy efficiency school programs, [Green Schools](#) and [Green Campuses](#).⁷ The Alliance’s model harnesses the enthusiasm and imagination of young people and is specifically designed to *empower students as change agents for energy efficiency*.

The first step is to integrate energy efficiency concepts into a standards-based school curriculum spanning math, science, social studies, language arts, etc. We then take this learning beyond the classroom to achieve measurable energy efficiency improvements in:

- o the home, by getting students involved in home energy audits and follow-on actions to implement low-cost and no-cost measures;
 - o the community, through service projects and fundraising sales of energy-saving products; and
 - o in school facilities themselves, by engaging students, teachers, administrators, and building operators in identifying and implementing energy-saving measures and practices, and then measuring and monitoring the resultant savings.
- *TVA has established the value of collaboration within its own service territory; there is even more to be gained by broadening the base of collaborative efforts.* Among the promising paths for collaboration are:
 - o TVA’s continued involvement with regional energy efficiency initiatives like SEEA
 - o Linkage of energy efficiency with other important policy goals – like water conservation⁸ and indoor environmental quality in schools and workplaces.
 - o Partnering with gas utilities on program design and delivery to customers who use both gas and electricity. Utility cooperation, and even co-funding of efficiency rebates, can make sense to the customer and to both utilities in cases where a measure such as envelope insulation or duct sealing saves both gas in the winter and electricity in the summer.
 - o Participating in new national initiatives like the [Zero Energy Commercial Buildings Initiative](#) (CBI) authorized in the Energy Independence and Security Act of 2007.⁹

Program Measurement and Evaluation

If it is not already common practice in the service territory, TVA and its distribution utilities should follow the “standard practices manual” for DSM program measurement and evaluation. These standard methods were originally developed for use by investor-owned utilities in California, and are now widely adopted by utilities and state DSM programs nationwide.¹⁰ The methods include 4 cost-effectiveness tests, of which the “total resource cost” test is the most

⁷ Also see the two attachments, and the online [newsletter](#).

⁸ See the attachment on “Watergy™” programs that combine water and energy efficiency, and the [Watergy website](#).

⁹ Also see the CBI attachment.

¹⁰ See “[California Standard Practice Manual Economic Analysis of Demand-Side Programs and Projects](#).” Another useful resource is the “[Model Energy Efficiency Program Impact Evaluation Guide](#),” prepared for the National Action Plan for Energy Efficiency.

significant from a policy perspective, to create a level playing field for both demand-side and supply-side resources.

In most cases, utilities contract with experienced third-party evaluators for both process and impact evaluations, allocating between 2% and 10% of program funds for evaluation data collection and analysis. We recommend that all program evaluation results, after an opportunity for review by program managers, be made available to the public.¹¹ Together, these actions will represent a commitment by TVA to pursue best-practice DSM measurement and evaluation.

Finally, we recommend that TVA continue the process exemplified by today's "listening session." In addition to soliciting input from the general public through meetings and other means, TVA should again follow utility best-practice by establishing an advisory committee composed of interested parties within the region and energy efficiency experts from around the country. Broad input from both utility customers and energy efficiency specialists is needed to review the effectiveness of TVA demand-side management programs, progress towards established goals, and periodic re-consideration of these goals with a view to raising the bar for energy efficiency, conservation, and load management whenever possible.

These steps will build on TVA's existing efforts and strategic plan, helping you fulfill your commitment to be a leader in energy efficiency, conservation, and peak demand reduction.

Thank you for your attention.

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Attachments:

- "Commercial Buildings Initiative"
- "Alliance to Save Energy, ACEEE, and the Energy Future Coalition Support for the Duke Energy Save a Watt Initiative" (Fact Sheet, 2/08)
- "Energy Efficiency Codes Collaborative"
- "Green Campus Program"
- "Green Schools Program"
- "Selecting Energy Efficient Windows in Tennessee"
- "Watergy"

¹¹ One good example of this practice is the California Measurement Advisory Council (CalMAC) [website](#).