

**Minutes of the Research, Outreach and Economic Development Committee**

**The University of Tennessee  
Board of Trustees**

**October 8, 2009  
Knoxville, Tennessee**

The Research, Outreach and Economic Development Committee of the Board of Trustees of the University of Tennessee met October 8, 2009, in Room 223-225 of the University Center on the UT Knoxville campus.

**I. Call to Order**

Mr. Don Stansberry, Chair, called the meeting to order at 3:50 p.m. and asked Dr. David Millhorn to call the roll.

**II. Roll Call**

Dr. Millhorn called the roll and the following voting members were present:

Mr. Don Stansberry, Chair  
Mr. Crawford Gallimore  
Mr. Tyler Forrest  
Ms. Monice Moore Hagler  
Mr. Jim Murphy  
Dr. Verbie Prevost  
Ms. Betty Ann Tanner

The following non-voting members were present:

Dean Dick Gourley  
Dr. Karen Johnson  
Ms. Sharon Rollins  
Dr. Jan Simek  
Mr. Glenn Turner  
Mr. Sumeet Vaikunth

Commissioner Ken Givens, Mr. Doug Horne, Dr. Richard Rhoda and Commissioner Tim Webb were absent from the meeting.

Dr. Millhorn declared a quorum present for the meeting.

### **III. Approval of Minutes of the Last Meeting**

Mr. Stansberry stated minutes of the June 17, 2009, meeting in Knoxville had been sent for review and were in meeting notebooks. He asked if there were any corrections to be made. There being none, Mr. Stansberry asked for a motion to approve the minutes. Mr. Gallimore moved the minutes be approved and Ms. Hagler seconded the motion. No discussion took place and there were no dissentions in voting to approve. Mr. Stansberry announced the motion carried.

### **IV. Special Projects Progress Report**

Mr. Stansberry recognized Dr. David Millhorn, UT Executive Vice President, to report on the progress of special projects for the University.

Dr. Millhorn presented a power-point presentation of updates for eleven special projects, beginning with ARRA (stimulus) funding. Data provided by the UT Treasurer's Office indicates a current total of \$90.78M awarded to the University, \$62.5M of which is designated as UT System awards. As these numbers are changing every day, Dr. Millhorn wants to give the Board an idea of what has been thus far been awarded. There is more than \$246M pending in award funding and the University should know very soon about these awards. Dr. Millhorn noted that UT faculty has been extremely diligent in working on these proposals in addition to continuing their regular responsibilities at the University. They are to be congratulated on their excellent work.

The Tennessee Biofuels Initiative will be expanded upon by Dr. Kelly Tiller later in the meeting, Dr. Millhorn noted; however, Dr. Millhorn pointed out that the pilot biorefinery project is on time, on budget, and in scope. The "topping out" ceremony for this facility was held October 7 and commissioning activity is to begin December 14. There are approximately 6,000 switchgrass acres under contract for summer 2010. A new generation cooperative has been formed for biomass production, and a restructuring of Genera Energy, LLC (Genera) has facilitated accommodation of additional business units. Plans are moving ahead with Genera and DuPont Danisco Cellulosic Ethanol, LLC (DDCE) for a 15M-gallon commercial biorefinery facility to be built in Tennessee.

The Volunteer State Solar Initiative is a program created by the Governor with \$62.5M ARRA energy funding received from DOE to UT. \$31M will be used to create a solar farm in Haywood County and \$29M will be used for funding innovation and installation grants. Genera will manage the solar farm construction and UT Research Foundation (UTRF) will manage the grants program. The Tennessee Solar Institute will be created by UT and Oak Ridge National Laboratory. The Governor seems most pleased with the biofuels model. The Solar Institute will provide UT opportunities to do business with

more companies and will allow additional partnerships in teaming for funds competition.

Dr. Millhorn outlined aspects of the Wind Energy Initiative, a \$45M proposal to DOE to construct and manage a test facility for large wind turbine drive trains. If awarded, the project will be located on the UTSI campus in Tullahoma and renovation of an existing building will accommodate the test facility. Tennessee is not a “wind state” in that wind flow is normally not very high within Tennessee; however, UT technology can be used to test and certify new turbines and Dr. Millhorn described this process. Partners in this initiative include UT, UT Space Institute, Jacobs Technology (a division of Jacobs Engineering), whose home office is in Tullahoma, and Arnold Engineering and Development Center (AEDC). There is only one other wind turbine testing facility in the country (the National Renewable Energy Laboratory), located in Golden, Colorado. If successful in receiving this award, two wind turbine test facilities having 15 megawatts capability will be created. AEDC has experience in moving very large rocket boosters and they will use a similar procedure in moving the wind turbines to UTSI. Utility infrastructure upgrading in Tullahoma and the creation of a national customer base, allowing increased collaborations, are among many expected benefits from the award.

Within the Experimental Program to Stimulate Competitive Research (EPSCoR) initiative, Dr. Millhorn illustrated the status of U.S. states, including Tennessee, which had not received a fair share of National Science Foundation (NSF) grants and awards (receiving less than .75 of the NSF budget; UT receives .63). Dr. Millhorn noted that Tennessee had “graduated” as ineligible to submit a proposal a year or so ago but that the state had “flunked” back into eligibility. An application will soon (October 19) be submitted on behalf of UT to the NSF request for proposals for the EPSCoR Research Infrastructure Improvement Program, RII Track 1. Partners in the EPSCoR proposal are UT, Vanderbilt and the Tennessee Board of Regents. The proposed work will leverage the established relationship between UT and ORNL to enhance collaboration across the state. The \$20M EPSCoR funds will be used, among other things, to secure equipment and infrastructure needs that will directly enhance the research efforts outlined in the proposal. A component of the proposal is focused on STEM education and workforce development. The bid results should be known before the year’s end. Dr. Millhorn thanked Dr. Stacey Patterson (UT Director, Research Partnerships) for her most impressive leadership for the EPSCoR proposal effort.

Dr. Millhorn noted that the Cherokee Farm initiative is of most immediate concern on the list of special projects since this project was somewhat vulnerable during the last legislative session. He emphasized making this the University’s top priority and in getting started in moving this project along, especially in terms of funding. State Treasurer David Lillard is coming to UT next week for a briefing on the Cherokee Farm project, the biofuels project, and several other key projects which have state funding. The Cherokee Farm project has had state money for three and a half years now. Dr. Millhorn noted the master plan and guidelines have been approved by the State

Building Commission and the project is in the final stages of design for the infrastructure aspect and the Joint Institute for Advanced Materials (JIAM) building. The bid process on both projects is expected to occur in November. Discussions are taking place concerning lease agreements and potential tenants for the project. Mr. Talbott asked why the project was not moving along. Dr. Millhorn said it was most important to get the RFPs on the street, selecting construction designs, and so forth. There are a large number of elements to the project and it is crucial one element not stall productivity by causing a delay in the overall project and its mission. Mr. Talbott said the project should be overseen by a project developer to be given the full focus it must have to effectuate the success of the project.

Dr. Millhorn described the Governor's Chair program begun at UT approximately five years ago to recruit outstanding scientists to UT and ORNL. UT and ORNL co-recruit and co-hire these individuals. There are now seven Governor's Chairholders, six on the UT Knoxville campus (Drs. Howard Hall, Nuclear Engineering; Yilu Liu, Energy and Engineer Science; Frank Loeffler, Environment Microbiology; Alexei Sokolov, Polymer Science, Thomas Zawodzinski, Electricity Storage) and one at the UT Health Science Center (Dr. Robert Williams, Genomics and Disease Models). Dr. Millhorn thanked those involved in these recruiting efforts, including the search committees, for their successful work this past year. There are currently several additional recruitment efforts underway. Computational Science and Climate Science are emerging focus priorities in this initiative. The Governor's Chair positions, salaries, recruiting efforts, space aspects, and start-up costs are split between UT and ORNL. This initiative attracts top-notch talent for the two institutions and it is a prime example of the benefits of the UT-ORNL partnership. Approximately 15-20 total Governor's Chair positions are anticipated. Individuals appointed to these positions are expected to establish first-class programs and to generate revenues to continue to raise the quality of research at the University.

The UT-ORNL Joint Institutes program was outlined by Dr. Millhorn. There are four Joint Institutes:

- Joint Institute of Biological Sciences (JIBS)
- Joint Institute of Computational Sciences (JICS)
- Joint Institute of Neutron Sciences (JINS)
- Joint Institute of Advanced Materials (JIAM)

Dr. Millhorn noted that JIBS, JICS and JINS (construction is underway and is expected to be complete within the next year) are located at ORNL. JIAM will be located on the Cherokee Farm site. Construction bids are soon to go out for the JIAM building. Each Institute is home to a major program. The Bioenergy Science Center (BESC) operates out of JIBS and is funded over a five-year period for \$135M to create new breakthroughs in transportation fuels. JICS houses the supercomputers recently highlighted in the news media and it is an extremely successful Institute. Ancillary grants to UT and ORNL resulting from the supercomputer have amounted to \$125-130M. JIAM will be home of part of the solar program. JINS will make use of its proximity to the Spallation Neutron Source facility at ORNL.

The UT Research Foundation (UTRF), Dr. Millhorn noted, has been reorganized and restricted under new leadership, as reported at the June Board meeting. Dr. Randy Gentry was introduced to the group by Dr. Millhorn as the new president of UTRF. The new organization features two centers for development and commercialization of intellectual property and a central office. The two centers are:

- Knoxville, with a multidisciplinary emphasis
- Memphis, which will have a biomedical emphasis

An advisory panel for each center is in place, with an overarching Board of Directors headed by former UT Trustee Mr. Waymon Hickmon. The structure now in place should operate more efficiently and should bring in more business to generate new revenue pathways for the University.

The UT-Battelle partnership in managing Oak Ridge National Laboratory for the Department of Energy was noted by Dr. Millhorn as being a major component in the University's list of top initiatives. The UT-Battelle 50-50 partnership was formed in 2000 after the partnership received the DOE contract to manage ORNL. There are seven Core Universities which form an advisory body to UT-Battelle: Virginia, Virginia Tech, Duke, North Carolina State, Georgia Tech, Florida State and Vanderbilt. Funding from DOE has increased from an initial \$800M a year to a current \$1.6B annual budget. This money is used for Lab operations and science and technology. ORNL is an undisputed world leader in computing, neutron science and materials science, with new initiatives in climate science and nanomaterials. Dr. Millhorn has asked Dr. Thomas Zacharia, Deputy for Science and Technology at ORNL, to give a review of things going on at the Lab and this report will immediately follow Dr. Millhorn's report. The University has had interaction with the Lab since 1943 during its involvement with the Manhattan Project, and this involvement has since grown to the current UT-Battelle Lab management partnership. UT continues to look for ways to interface with the Lab to gain even more opportunities for faculty and students. This past week was a monumental time for the Lab. As many people know, ORNL houses UT's high-performance computer that was created with a \$65M NSF grant in 2007 to develop the National Institute for Computational Sciences (NICS). Dr. Zacharia is the Principal Investigator for the award. Originally the high-performance computer was to operate at 250 teraflops. Last week this operation was upgraded to almost four times this size and it became the first academic computer in the world to be over a petaflop in speed. There are now two petaflop computers at ORNL, which puts UT-ORNL in a league all its own. The computers are open to the user community, which allows additional opportunities for networking with top scientists around the world. The number of joint UT-ORNL faculty appointments, of students working at the Lab and of joint programs is growing.

Dr. Millhorn also discussed the UT-Battelle partnership recompetition process. After receiving the five-year lab management contract in 2000, DOE extended the contract for an additional five years in 2005. It is mutual thinking of UT-ORNL leadership that a bid recompetition will take place when the contract expires in spring 2010; however, once

DOE makes this determination, there will be a 1-2 year extension to work through proposal guidelines and bureaucratic procedures to compete for the contract. The UT-Battelle team would prefer not to recomplete. It believes it has done an outstanding job to justify another automatic award, and the belief is also held that DOE leadership concurs with this opinion. Word should be received fairly soon by DOE concerning the rebid status. If a rebid proposal is to be undertaken, the UT-Battelle team feels confident about its success. However, the process is a most expensive and time-consuming one. UT-Battelle would like to put its money and its time towards other efforts.

The final project discussed by Dr. Millhorn was Information Technology. UT's Chief Information Officer (CIO) Scott Studham made a presentation at the Board of Trustees meeting last June. The intent in bringing Mr. Studham to UT as CIO was to fix deficiencies and to elevate IT services across the UT system. A first-class university must have first-class IT. Mr. Studham has gone to the campuses in an effort to look at ways to increase performance and to look at budget efficiencies. He has been working with Chief Research Officers, campus CIOs, and Chief Financial Officers to determine what kind of performance needs to be achieved, the costs involved, and what things can be done together to avoid duplication of services and costs. Mr. Studham is also overseeing the Student Information System (SIS) on all the campuses. UTM has been using this system for a while now and has been the model for UT SIS progress. UTC is close to getting their system up. Another data base at UT is the Tennessee Educational Research Administration (TERA) program. TERA allows tracking of all UT's research components including compliance issues, where the money is, which organizations are funded by how much, trends in funding, who collaborators are, keeping up with the percent efforts assigned to the grants, and keeping UT within the regulations and producing information which provide reporting and so forth. Using the best business practices to better serve customers and performing these services in the most efficient and economical way possible is critical for the University.

These eleven initiatives provide a snapshot of what has been worked on at the University within the past year, Dr. Millhorn said. There are many important initiatives taking place. Despite a world-wide economic downturn, the University is continuing to compete well and it will continue to build programs to elevate the stature of the University.

Dr. Millhorn asked for any questions concerning his presentation. Ms. Loughry asked when the University would be notified about the wind turbine proposal award. Dr. Millhorn gave a brief history of this initiative, saying the University had been given one month to prepare the proposal. The application was submitted with all the criteria asked for within the proposal. Results should be known by the end of October or in early November. Mr. Cates asked who was competing for the award. Dr. Millhorn said this information is not known; however, there are few universities around the country who have partners like AEDC. It is suspected 2-3 other proposals were submitted. Dr.

Millhorn noted that when the University began looking around to compete, two of the largest windmill construction companies were found to be in Chattanooga. TVIG has built windmills all across the country. EMJ Corporation is rated #2 in the nation. Both firms have a great track record and are moving into solar energy and other areas of renewable energy.

In regard to Cherokee Farm, Mr. Talbott noted that a project developer should be named to the project as soon as possible. Until now, Dr. Millhorn said, the project has been progressing to the point of naming an individual to this role. Dr. Simek said the approval and bid process for construction will be carefully monitored and a project manager will be named. Mr. Talbott noted that a construction manager and a developer were separate functions and a project developer was needed to oversee the whole process.

Mr. Stansberry thanked Dr. Millhorn for his report.

## **V. Oak Ridge National Laboratory Update**

Dr. Thomas Zacharia noted that the last time he addressed the group he was part ORNL as Associate Lab Director for Computing and Computational Sciences and part UT as Vice President for Science and Technology. Since that time he has gone to 100 percent with ORNL as Deputy for Science and Technology. As Dr. Millhorn had presented an overall view of what is taking place in Oak Ridge, Dr. Zacharia said he wanted to give an additional sense as to what ORNL is all about. ORNL is DOE's largest science and energy laboratory. It has an annual budget of \$1.7B. Under the management of UT-Battelle, as pointed out by Dr. Millhorn as well, ORNL has added \$1B to its budget in revenue. There are 4,500 employees, 4,000 guests annually from all over the world, and \$500M has been invested in the Lab's modernization. ORNL used to have a WWII atmosphere; however, today it is truly a modern research campus. ORNL has the nation's largest concentration of open source materials research and it is home of the world's most powerful pulsed neutron source and a world-class research reactor. These factors attract the best scientists from all over the world. An example is yesterday's announcement of American Dr. Venkatraman Ramakrishnan receiving the 2009 Nobel Prize for Chemistry. Dr. Ramakrishnan was a staff member at ORNL in the early 80's and did neutron-scattering experiments with biological materials at the High Flux Isotope Reactor. He left to go to Brookhaven because that institution had just brought up the NSF light source and he was offered a unique opportunity to perform science. Similar outcomes are expected for the ORNL Spallation Neutron Source (SNS) in attracting top scientists from all over the world. ORNL has two of the top 3-5 computers in the world--the fastest academic computer and the fastest computer period--with remarkable capabilities. ORNL has the nation's most diverse energy portfolio and it is managing the billion dollar U.S. ITER project (which has a ~\$20B total budget).

Dr. Zacharia showed funding and core capabilities comprising the \$1.7B budget via a pie chart and descriptions adding key sponsors and resources for the core capabilities. Science comprises \$524M, ARRA \$328M, Energy \$205M, National Security, \$158M, and other (Work For Others and capital/construction) \$489M.

In regard to the UT-Battelle rebid of ORNL management, Dr. Zacharia said the partnership is looking at the “second act.” The first act was getting on site and revitalizing the ORNL campus with new and upgraded buildings, initiating programs such as the Governor’s Chairs, creating the Spallation Neutron Source (SNS) and so forth. The second act is the stage of delivering on the promise of these projects and collaborations. One of the key focus areas is reenergizing the culture of the Laboratory. There is at present a remarkable tradition at ORNL, but there is no reason not to aspire to be among the truly elite of scientific research in the world. Enhancing ORNL’s science and technology reputation by creating a talent pipeline, partnering globally, attracting and retaining the most talented researchers in the world, integrating laboratory, university and industry activities, and driving innovation are key priorities to delivering these results.

Another key component is for UT-Battelle/ORNL to pursue an expanded graduate research and education agenda. DOE Secretary Stephen Chu, U.S. Under Secretary of Science Steve Koonin, and U.S. Under Secretary of Energy Kristina Johnson all come from academic backgrounds, thus it is not surprising that the Department of Energy is highly focused on graduate research and education. About 50 percent of the nation’s energy workers can retire in 5-10 years. Here is an opportunity for ORNL to train a work force in a cutting-edge research environment. This enhances not only ORNL and UT employees in the future, but it also is vital for the general national global work force. There are approximately 1,000 Ph.D. employees at ORNL. Thirty-five percent or 350 have been hired within the last five years. ORNL expects to hire 350-400 Ph.D. personnel over the next five years. Roughly 15 percent of ORNL Ph.D.’s are trained by the University of Tennessee. ORNL works very closely with UT in this regard. The UT-Battelle Board of Governors actively pursues this close relationship and focus. The Chair of the UT-Battelle Board of Governors (BOG) is UT President Jan Simek, and other BOG members are UT Executive VP David Millhorn and UTK Chancellor Jimmy Cheek. UT-Battelle/ORNL leadership is working to broaden and strengthen academic partnerships in addressing national priorities. Dr. Zacharia showed graphics of the large variety of ORNL graduate education activities, key faculty fields and focus areas.

ORNL headlines since May 2009 in the areas of neutron sciences, computing and computational sciences, materials and chemical sciences, nuclear physics, biological and environmental sciences, and energy and engineering sciences were shown and described by Dr. Zacharia. Some headlines include the Spallation Neutron Source (SNS) operations were on schedule, upgrade of the UT-ORNL NSF Track 2 computer (Kraken) is on time, two Energy Frontier Research Centers have been established, and Governor’s Chairs were hired.



Dr. Zacharia outlined planned receipt and use of FY09 ARRA funds at ORNL. Directorate awards thus far include:

- Biological and Environmental Sciences Directorate, \$9.1M
- Energy and Engineering Sciences Directorate, \$80M
- Physical Sciences Directorate, \$17.2M
- Computing and Computational Sciences Directorate, \$99.5M

Within the Computing and Computational Sciences Directorate, \$73.4M will enable a National Oceanic and Atmospheric Administration (NOAA) climate research project. This award was made on the basis of the huge computer capacity at ORNL. ORNL is also a partner on 13 DOE ARPA-E (Advanced Research Projects Agency-Energy) projects. These projects could bring almost \$10M to ORNL over the next five years.

A list of FY09 science and technology challenges and outcomes was shown by Dr. Zacharia. Among the S&T challenges was implementation of ORNL's climate strategy. A new Climate Institute has been created aimed at developing new competencies. The Oak Ridge Institute for Climate Change Science was highlighted in this discussion. Dr. Zacharia gave an update on the UT-ORNL Joint Institutes and corresponding achievements and project status within the Institutes. ORNL hopes to build on the Joint Institutes program to expand collaborations with UT. Dr. Zacharia noted there are 68 Joint UT-ORNL faculty members. Dr. Zacharia noted that ORNL has top-notch people driving not only the ORNL agenda but the national science agenda as well.

Dr. Zacharia concluded his presentation with a Jaguar XT5 computer modeling simulation of typhoon and hurricane formations, overlaid on population distributions in India and China, depicting how climate change is impacting or will impact these large regions in terms of food production, water and river changes, population changes and a multitude of other serious environmental and economic issues.

Mr. Stansberry thanked Dr. Zacharia for his presentation and said Dr. Zacharia had certainly demonstrated the outstanding resource of ORNL and said UT is partner in a most significant enterprise. Mr. Stansberry asked what needed to be done for UT to maximize its relationship with ORNL and the benefits of this partnership. Dr. Zacharia said at its core, the University is in the business of training students. A deeper engagement with ORNL in graduate education and research in developing and strengthening programs together will be critical to grow the Laboratory enterprise. Dr. Simek noted that the Joint Institutes are keys to this growth. Dr. Cheek gave examples of such growth in the appointments of five Governor's Chairs in the last several months and the launch of a joint UTK-ORNL graduate fellowship recruitment program that will bring some of the top students in the world to the University. Efforts will be made to push such endeavors to continue building the UT-ORNL relationship and creating more strategic opportunities for the University.

## VI. Update on Biofuels Initiative

Mr. Stansberry recognized Dr. Kelly Tiller (President & CEO, Genera Energy LLC; UT Director of External Operations, Office of Bioenergy Programs) to provide an update on the UT Biofuels Initiative. Dr. Tiller noted the comprehensive approach and complexity of the initiative in going from the farm to a commercial, thriving industry. Strong partnerships are key components to the initiative and these include the UT Institute of Agriculture with both UT AgResearch and UT Extension, on the farm side, and, on the research side, with the Bioenergy Science Center (BESC) at ORNL and DuPont Danisco Cellulosic Ethanol LLC, (DDCE), among others.

Dr. Tiller stated the switchgrass program is on track and is exceeding expectations. Farmers are excited about the opportunities the crop brings. There are now ~2,700 acres in switchgrass production on 40 farms, with an additional ~3,000 acres in process for planting in spring 2010. Transitioning from state subsidies and moving to more market-oriented contracts with Genera Energy for 2010 is in progress. A marketable seed industry is being developed to supply and benefit local farmers. Dr. Tiller showed a map of locations of the contracting farmers involved in the program. The 40 contracting farms represent a wide variety of conditions and they are located within a 50-mile radius of Vonore, Tennessee. The scale of the program can be viewed as a very large research campus, providing ample opportunities for R&D.

An overview of the pilot cellulosic ethanol biorefinery operation was given by Dr. Tiller. Construction of the biorefinery facility, located at the Niles Ferry Industrial Park in Vonore, began with concrete footers poured in late May 2009. The project is on schedule with completion expected in December of this year. The biorefinery is very much a research facility. Collaboration with DuPont Danisco is providing many opportunities to bring research out of UT and ORNL and is bringing commercial benefits as well. The scale of the operation is fairly small: a 32-acre site and a 250,000 GPY pilot plant and Process Development Unit (PDU). Both pilot and PDU will be operational by the end of 2009, operating on cob in the pilot and starting up the PDU with switchgrass. Dr. Tiller presented slides showing the impressive construction progress of the facility and showed a video presentation featuring Jon Walton and Ken Goddard of the UT Extension program who described progress on the biorefinery and the switchgrass program. Dr. Goddard said that farmer-producers are excited to partner with UT in introducing a new alternative crop that has so much unlimited potential for agriculture in the state of Tennessee.

Dr. Tiller noted that steps now are moving beyond the demonstration of the biorefinery to developing an entire portfolio of switchgrass utilization, which is most important in developing opportunities for the longer-term bioenergy market. Switchgrass pelleting, co-firing with coal, switchgrass gasification, switchgrass torrefaction, and fast pyrolysis were highlighted within research emphasis areas of biomass productivity, bioengineering (the handling and logistics of the crop) and the development of co-

products to add additional economic opportunity. Work on building the biomass infrastructure is underway, giving Tennessee a headstart and perhaps the biggest opportunity to attract new investment in this industry. In the long run, biomass drives the location of the investment. This focus includes pilot seed harvest and processing through a joint venture with Bamert Seed Company, the award of a \$4.9M DOE award to look at high tonnage biomass logistics and handling systems, and the formation of the Tennessee Biomass Supply Cooperative, which addresses a huge need in the industry as it matures from infancy to help farmers aggregate the materials and extract value prior to processing and retain this value within the state. Pre-processing, transportation and other services are involved in this supply chain.

Dr. Tiller discussed the restructuring of Genera Energy, LLC to accommodate new opportunities and appropriately manage risks to protect large assets and investments. These aspects have been segregated into separate business units, all still under the umbrella of Genera Energy. Genera Energy is fully owned by the UT Research Foundation (UTRF) and is ultimately participating in not only Biofuels, Biomass and Capital as part of the new generation cooperative, Tennessee Biomass Supply Cooperative, but in Solar Solutions with the Volunteer State Solar Initiative. The Volunteer State Solar Initiative is a \$62.5M investment by the state to make a significant leap forward in advancing the state's position in clean energy technology. There are two parts to the program, the Tennessee Solar Institute Grants Program (to be administered through UTRF, \$29.7M) and the West Tennessee Solar Farm (a large-scale utility demonstration farm near Brownville, \$31M). It is expected the DOE funds coming into the state of Tennessee will flow by contract to UT and then by separate contract into UTRF, which will manage the overall programs, with the solar farm portion going through Genera Energy (development, installation and operation of the solar farm) and the other part to be managed in Installation Grants (\$9M) and an Innovation Grants (\$14.M) programs. Dr. Tiller presented graphic views of the location under consideration for the solar farm. Dr. Tiller said she believes the state can be very proud of this contribution to developing new clean, renewable energy.

Mr. Cates asked Dr. Tiller about the torrefaction process. Dr. Tiller said this is similar to charcoal in that a chemical transformation of the materials in the absence of oxygen and under heat results in a product that can be pulverized and which is appealing for use in the co-firing of coal. Mr. Cates asked about the timeframe of switchgrass harvest. Dr. Tiller said harvest takes place after the first killing frost, which is usually around November. Mr. Wharton asked about the fuel economy of ethanol compared to gasoline. Dr. Tiller noted there is more energy content in ethanol than in gasoline. Internal combustion engines today would need a higher compression ratio to take advantage of all of the energy in ethanol. There is a reduction in gas mileage with high levels of ethanol in a fuel blend (e.g., 85 percent ethanol and 15 percent gasoline or E-85), up to 25-30 percent, and ethanol pricing generally accounts for this difference. Mr. Cates asked if Brazil had addressed the 25 percent aspect with different vehicles on the road. Dr. Tiller noted that Brazil has mandated that all vehicles used within the country

are to be flex-fuel vehicles, allowing interchangeable fuel usage. Price determines which fuel will be used at a particular point in time; however, Brazil has gone almost exclusively to ethanol. Mr. Schledwitz asked, the price of ethanol being what it is, has this delayed the prospect of making ethanol commercially viable. Dr. Tiller noted that in a commercial scale facility, projections indicate ethanol is commercially viable and competitive with oil at \$60/barrel at the point of production. Ethanol production is on track to be a cost-competitive process and there are good indications for even greater commercial outcomes. Mr. Schledwitz asked at what size the plant needs to be commercially viable. Dr. Tiller noted that present models indicate the first commercial-scale facilities would be about 15M gallons per year. The Vonore pilot facility is small-scale (250,000 gallons) and is viewed primarily as a very large research facility with extra bells and whistles for applied research. Mr. Gallimore asked about ethanol deterioration rates. Dr. Tiller responded that, as long as ethanol doesn't come into contact with water, it has a reasonably long shelf life. Dr. Tiller concluded her remarks in reminding members that the present focus of the biofuels initiative is switchgrass to ethanol production; however, long-run plans will most likely include other materials and also other uses. The main process is making sugars out of plant matter/biomass. Once these sugars are accessible, other chemical building blocks and fuels can be produced which may be a better long-run fit and may prove more cost-competitive in the market. Dr. Tiller said the biofuels initiative underway is an excellent start in this process.

Mr. Stansberry thanked Dr. Tiller for her presentation.

## **VII. University of Tennessee Research Foundation**

Dr. Millhorn introduced Dr. Randy Gentry as the new President of the UT Research Foundation. Dr. Gentry is a UT Associate Professor in Civil Engineering and he also heads up the Institute for a Secure and Sustainable Environment (ISSE) program. Dr. Gentry has begun the process of traveling around the state meeting people in his new role as UTRF president. Dr. Millhorn discussed the interview process for the position and said that Dr. Gentry had an impressive vision for the UTRF in making it a viable operation for the University using intellectual property development. Dr. Gentry will focus on developing relationships to increase UTRF activity, to grow UTRF and to be highly involved with UT's science for best use activities.

Dr. Gentry said it was a high honor and opportunity to serve as President of UTRF. Dr. Gentry thanked the leadership of Mr. Stansberry and the ROED Committee, Mr. Wharton, Mr. Schledwitz and others in providing assistance to the UTRF Board in the recent UTRF reorganization process in forming a vision for the future in UTRF activity and in creating a more decentralized organization that allows for greater local input and a stronger level of engagement with the campuses. Dr. Gentry, as Dr. Millhorn had indicated, is traveling to Memphis and other areas in his new role to better get to know faculty members, administrators and business partners such those at GTX. Looking at public-private partnerships to do some highly-targeted IP agreements is an important

part of this path for the future. Dr. Gentry said it is his goal, as president, to press this path forward at an accelerated rate. He will be working with Mr. Waymon Hickman and other UTRF Board members in looking at both near-term and long-term opportunities with directly-targeted IP partnerships. Things are on track and the goal is to gain momentum.

Mr. Stansberry thanked Dr. Gentry for his remarks. Mr. Stansberry recognized the outstanding cooperation and efforts received from both Dean Gourley and Dean Davis, heads of the two UTRF executive committees. Mr. Stansberry believes the organization is working well together and it appears the enterprise is poised to move toward achieving its mission.

### **VIII. Information Technology Report**

Mr. Stansberry introduced Mr. Scott Studham, UT's Chief Information Officer, to give a report on UT Information Technology Strategy. Mr. Studham noted that members had received a copy of the UT IT Roadmap in their Board of Trustees' notebook. This Roadmap report will continue to be updated as developments occur. The essence of the Roadmap is, and the first key component is, to fix the core of IT. During the last ROED Committee IT report, the topic of duplication identification was discussed. Mr. Studham emphasized that the cause of this duplication was almost exclusively due to failure to deliver a quality service on the part of the central IT organization. People were forced to go out and build or look to other systems. It is vital now to rebuild the relationship between the central organization and the distributive organizations.

Other key aspects in the IT Roadmap are:

- Have customers drive the direction of IT so it is what they need
- Reduce duplication and increase value from existing IT expenditures
- Document a customer-driven strategic plan

The strategic plan is not about what technology will be deployed—it's more important to listen to what customers say they need in the way of information technology.

At the last ROED Committee meeting Mr. Studham presented a two-phase strategy. The first phase, reorganization of IT, has been completed and the organization has gone from 40 IT managers (in a 300-person organization) to 20 IT managers. There are people now devoting 100 percent of their time to work with customers to understand what the customers' needs are and to document those into service catalogues. Mr. Studham noted that IT is an incredibly complicated environment. A change made in one area has interdependencies in other areas that will be affected by the change.

Mr. Studham presented a table with pre- and post-reorganization customer data obtained from customer surveys. At the beginning of the reorganization there were 15 different help-desk phone numbers for end users (customers). There is now one number to be called for assistance. Beginning January 2010 the assistance line will be

24/7. The call volume went up by 43 percent (5341 to 7662) and customer satisfaction improved by 24 percent in responsiveness, 30 percent in communication, and 8 percent in ability to deliver. Focus has been on listening to the customer. The next step will be focus on the delivery of service and Mr. Studham is confident this approval rating will increase. These improvements have been accomplished while reducing costs.

Budget bar charts for UT Knoxville (UTK Facilities Fee, UTK Base Budget, UTK Technology Fee), UT System Base Budget and all-UT service centers listing IT projects, IT operations, system services, security services, network services, application services, end user services, and cable TV and telephone services were viewed. UTK comprises approximately 70 percent of the IT service catalog. Mr. Studham noted that UTM has an excellent IT operation and he is very proud of their organization. The Office of Information Technology (OIT) has established a list of central services and OIT is working with each customer to establish their priorities. This effort will result in a change in what OIT does (what each customer wants IT to do) and, in some cases, which customer pays for a particular service. The next step will be to build customer IT plans. There may well be some realization that some System operations can be done better at the campus level and IT will work to transition these changes in a logical, transparent manner.

IT is working to reduce duplication and to increase value from existing IT expenditures. This complex project may take a year or two to phase out more complicated IT systems. Mr. Studham remarked that CIOs at each campus have done an outstanding job working towards increasing the value of IT. FY09 central account ledger numbers are down in a significant amount from FY08. Despite the University's growth, less money is now spent on IT because of the work in duplication reduction taking place at the campus level. Mr. Studham provided a listing of progress areas at each campus showing this progress. One example was a savings of \$200K at UTIA after partnering with UTK. "Working the ground" day to day in checking with the customer on what is needed, what equipment purchases are planned, and so forth is fostering partnerships and liaison communications essential in reducing duplicative services and providing significant savings for these IT customers and for the University. UTC and UTM have demonstrated exceptional use of "server virtualization," reducing the server room footprint which results in reduced energy requirements, increased redundancy and reliability, and increased tools for managing servers.

Mr. Studham showed a project timeline and milestone for the commitment over the next two years in quantifying and justifying IT expenditures and in the delivery of IT services. Key areas within the timeline involve:

- Realign IT with its customers
- State-wide strategic systems
- Improve budget efficiency and value

Within state-wide strategic systems, work is taking place on providing security based on national standards and in securing intra-campus networks. Common user log-in within

shared services across UT, for example, is an incredibly difficult process. To make sure that “Jeff Smith at UTK” can log in to a computer at UTM and not get tangled up in the identification of “Jeff Smith at UTM” is a complex undertaking. Mr. Cates inquired if “Jeff Smith at UTK” could log in at UTM and then log back into the UTK system. Mr. Studham responded that common-user IDs would facilitate the foundation for this collaboration site capability, allowing every user to communicate with all UT campuses. With this capability in place, Dean Gourley asked if he, as a faculty member at UTHSC, would be able to log in on a computer at UTK without first configuring into UTHSC. Mr. Studham said this would be the case if the UTK computer set-up had granted Dean Gourley user approval. At the present time, a “visitor’s ID” must be requested when logging in at another campus.

Mr. Studham highlighted the Banner initiative now up and running at UTC. It has been a decade-long process. Solid work has resulted in building a system which allows information to be moved in a consistent, comparable, reliable process.

Next steps for IT include:

- Quantify central and total IT costs to enable customers to make informed IT decisions
- Create a process for review, not approval, of IT purchases and new hires to ensure managers are aware of existing services
- Focus near-term efforts on UTK/UWA; work with UTK colleges to transition work responsibility of IT staff on stimulus money to ensure function continuity
- Continue to implement performance management in OIT and to consistently improve the quality of IT services.

Mr. Studham summarized key points in his presentation:

- Progress has been made in reducing duplication and increasing value
- Realignment of the IT organization to focus on customer driven IT
- IT Roadmap outlines IT strategy and shows how IT does its work
- IT is now at a point where it can hear what customers want IT to do

Mr. Stansberry noted that discussion at the last ROED Committee meeting indicated potential concern in receiving the necessary cooperation with campus units essential to make changes in the IT organization to achieve significant savings. Campus CIO cooperation and diligence, Mr. Studham said, has been most forthcoming in this process. Dr. Simek is highly engaged in the process to ensure executive support and is having weekly meetings on this focus. Mr. Stansberry asked Dr. Simek if he is confident actions are taking place to achieve the goal of maximizing IT savings for the University. Dr. Simek said the University is committed to this process and the goal is not to simply change the IT organization but to make it far better and more efficient.

Mr. Cates asked Mr. Studham if applications would be from the desktop or if applications would be centrally stored. Mr. Studham noted that the industry trend is web-based applications rather than from the desktop. General industry has significant streaming operations where users go to a website and interface with the application. This concept is being pushed aggressively by UT because of the need for desktop diversity.

Regarding IT security, Dr. Simek noted that UT's engagement with ORNL highlights the critical need for secure IT applications at the University. Good strides have been made in enhancing the security of IT in the last five years but efforts must continue to strengthen this IT issue. Mr. Cates asked if IT was yet able to identify and inventory server storage across the University. Mr. Studham noted that security and protection from hackers and other illegal uses of stored information on these servers is a critical component of the University's IT program.

Mr. Stansberry thanked Mr. Studham for his report.

**IX. Other Business**

Mr. Stansberry asked if there was other business for the committee. There was none.

**X. Adjournment**

Before adjourning the meeting, Mr. Stansberry noted that since becoming Chair of the ROED Committee he had spent a great deal of time in familiarizing himself with the research and economic development mission of the University. He believes the University is making significant progress in these areas and he commends Dr. Millhorn and his staff for their outstanding leadership. Initiatives highlighted at today's meeting are most significant. Mr. Stansberry said he appreciates the tremendous work taking place on these projects. There is significant potential to strength the University's standing with its current peer groups and, moreover, to move the University to even higher peer group levels.

The meeting was adjourned at 5:30 p.m.

Respectfully submitted,

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David E. Millhorn, Ph.D.  
Executive Vice President



