

Minutes of the Research, Outreach and Economic Development Committee

**The University of Tennessee
Board of Trustees**

**February 24, 2011
Chattanooga, Tennessee**

The Research, Outreach and Economic Development Committee of the Board of Trustees of the University of Tennessee met February 24, 2011, in Chattanooga Room A of the University Center on the UT Chattanooga campus.

I. Call to Order

Mr. Don Stansberry, Chair, called the meeting to order at 10:35 a.m. Mr. Stansberry asked Dr. David Millhorn, UT Executive Vice President, 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. Doug Horne
Mr. Jim Murphy
Ms. Betty Ann Tanner
Mr. Sumeet Vaikunth

The following non-voting members were present:

Dr. Joe DiPietro
Dr. Karen Johnson
Ms. Sharon Rollins
Ms. Carey Smith
Mr. Glenn Turner

Dr. Boulet, Dr. Gourley, Ms. Hagler, Commissioner Johnson, Dr. Rhoda and Commissioner Smith were absent from the meeting.

Dr. Millhorn declared a quorum present for the meeting.

III. Approval of Minutes of the Last Meeting

Mr. Stansberry asked for any amendments or corrections to the minutes of the October 21, 2010, meeting in Knoxville. There were none. Mr. Stansberry asked for a motion to approve the minutes. Ms. Tanner moved the minutes be approved and Dr. Johnson seconded the motion. No discussion took place. Mr. Stansberry announced the motion carried.

IV. News and Highlights

Dr. Millhorn began his presentation with updates on the progress of a number of projects taking place at the University. A recent power-point slide was shown of the Cherokee Farm site, UT's research innovation campus located across from the UT Medical Center in Knoxville, depicting earth-moving processes taking place. Substantial progress has been made with infrastructure installation of roads, utilities and communications by the Chattanooga firm EMJ Construction. Approvals of construction plans of the first building should be in hand by the end of March. Once the approvals are received construction should begin around the first of June. This building is the Joint Institute of Advanced Materials (JIAM) and will house both UT and ORNL research investigators. Opportunities for building construction are being sought from the private sector and a marketing plan is being developed to help identify companies which want to locate in the southeast and to help convince them Cherokee Farm in East Tennessee is the place to be.

The next activity Dr. Millhorn reported on was the UT Biofuels Initiative (UTBI) project and he noted it is moving along extremely well. With the escalating price of crude oil now at approximately \$100 a barrel and the price of gasoline continuing to increase, biofuels is a critical resource for our country and a threat to our national security in terms of economic development growth. With increasing gas prices the stock market has begun to decline. Much thought has to be given to alternative energy plans in such times.

Dr. Millhorn noted that in the premier bioenergy publication, *Biofuels Digest*, Genera Energy LLC, UT's biofuels company, won, along with Ceres and SG Biofuels, the Feedstock Development of the Year award. Genera, a young company just now three years old, is already in the forefront of national biofuels development recognition. A Biomass Innovation Park Phase I (receiving and storage) has been constructed in Vonore. When the UTBI began, the biggest risk, it was felt, was technology—did we have the technology to allow us to isolate high-value sugars? At the Vonore biorefinery this process is taking place. Now, the biggest challenge is to supply a large biorefinery that is making 50M gallons of fuel a year with enough biomass to keep it running 365 days a year, 24 hours a day. The Biomass Innovation Park, being constructed in several phases, with funding from the Department of Energy, is dedicated to this biomass quantity challenge. When the biorefinery project began, UT was in a joint venture with

DuPont Danisco Cellulosic Ethanol (DDCE). In January, an announcement was made by DuPont that it was acquiring Danisco. DuPont acquired Danisco for \$6.3B (with approval by the European Union). UT and Genera are also planning the next step, which is building a commercial-scale biorefinery. These facilities are very expensive. The demonstration-scale biorefinery in Vonore was built for approximately \$70M. The commercial-scale biorefinery will be much larger and much more expensive to construct. DuPont will build two such biorefineries, one in Iowa and one in Tennessee (at a location already selected but yet to be announced). Dr. Millhorn said he hoped by the next ROED meeting to share this now-embargoed information. It is hoped, Dr. Millhorn stated, to have in Tennessee by 2014 the first commercial-scale biofuels plant using a dedicated energy crop of cellulosic biomass. To provide enough biomass for a commercial-scale biorefinery of this magnitude will require somewhere around 75,000 acres of dedicated crop.

UT has approached the U.S. Drug Administration (USDA) to participate in their V-Cap program, a bio-crop assistance program. A proposal is being prepared with assistance from the Institute of Agriculture. The proposal should be submitted to the USDA within the next month with a request of \$50-75M and indications are favorable.

At the demonstration-scale biorefinery in Vonore, ethanol is being produced in sufficient quantities for research purposes. Genera worked with DuPont-Danisco to ensure that DDCE gifts all the ethanol produced at the biorefinery to the University. This ethanol is used to run UT's E85 Fleet and amounts to about 8,000 gallons a month and \$250,000 per year.

Dr. Millhorn noted that information had been given previously at ROED meetings concerning the Afghanistan project. The U.S. military is concerned about its future fuel supply, especially JP8 (jet fuel), and UT-Genera was invited to submit a proposal to the Department of Defense to prepare an in-depth analysis of the technology needed to produce JP8 fuel. There is a huge market for this product and our national security is dependent upon having this kind of sustainable fuel source. Current Middle East regime changes and war-like postures are driving the price of oil up. Predictions of \$5/gallon prices in the U.S. by the end of this summer have been made. Energy is one of the President's highest priorities. Mr. Talbot asked if UT had an equity interest in the commercial biorefinery/biofuels plans. Dr. Millhorn said there is an agreement in process on the biomass side with DuPont and royalties will come back to the University. There is a success fee to be distributed after a certain level of productivity and profits are reached. Part of the rationale for forming Genera Energy LLC, a private company, is the need for confidentiality in financial arrangements and in the way its business is conducted with other companies. UT's agreement with DuPont is the one of the most favorable agreements DuPont has with any company and UT is most pleased with the agreement. Mr. Talbot asked if the 75,000 acres of dedicated crop needed for a commercial-scale biorefinery operation had to be within a certain radius of the model. Dr. Millhorn said it did and this range also depends on what part of the state the

operation is in and what the economic model looks like in connection with railways, spurs and so forth. Dr. Millhorn noted that rural counties, in particular, will benefit from such an operation. Biomass producers, it is anticipated, will have a 10-20 year contract. There are significant benefits to all parties in this endeavor.

Dr. Millhorn noted UT is a candidate for a \$45MM EFRI (Energy and Food Research Institute of the U.S. Department of Agriculture) award through the new Center for Renewable Carbon which Dr. DiPietro discussed at the October ROED meeting. Eight finalists have been selected and three awards will be made. Finalists travel to Washington, DC, for a March 10 site visit with the USDA. If successful this award will be the largest received by the UT Institute of Agriculture. The importance of energy, Dr. Millhorn noted, is of strategic value to Tennessee and for our country. Governor Haslam is highly supportive of new jobs development for the state and the best way to attract new jobs is to have affordable energy. Tennessee is out front in energy initiatives due to innovation engaged in early on.

One such energy innovation project is the Volunteer State Solar Initiative. This initiative is funded with a one-time \$62.5MM ARRA Department of Energy award. Former Governor Bredesen chose to invest this award in one large project rather than dispersing it in a multitude of small awards. The project is designed in two general parts. One is a \$31MM Solar Farm being built in West Tennessee near Brownsville off I-40. Work is now underway on this 5MW utility-scale solar farm. Dr. Stacey Patterson (UT Director of Research Partnerships) is coordinating a power-purchase agreement with TVA. Signal Energy, another Chattanooga company and a subsidiary of EMJ, received the project bid and is now beginning work on the Farm site. This is a 25,000 solar-panel project to be completed by the end of the calendar year. Solar Farm site plans also include a combination rest area-welcome center and solar energy education facility to be built by the Tennessee Department of Transportation (TDOT). The Department of Energy (DOE) gave a go-ahead for the Solar Farm plans a month ago and now certain state environmental approvals are being obtained.

The second segment of the Volunteer State Solar Initiative is the Tennessee Solar Institute and within this segment is the \$9MM Solar Installation Grant Program. In this program matching funds are provided for small businesses to install solar devices on or near their facilities. Within this program 109 projects were approved and these awards covered all nine Congressional districts. These devices will generate approximately 5.8MW capacity of electricity, which is slightly more than the Solar Farm will create. Importantly, this program has leveraged an additional \$24MM in private-sector investment money and jobs for the state. Mrs. Blackburn asked what 5MW electrical capacity could provide and Dr. Millhorn said this would generate enough electricity for 500 houses. Dr. Millhorn noted that in Germany approximately 1.4GW of solar panels were installed last June, in one month, which is more than the entirety of U.S. capacity. The U.S. must capitalize on alternative forms of energy to move the country forward.

The \$14.5MM Solar Innovation Grant Program is the second program within the Tennessee Solar Institute. These grants are awarded to businesses to improve existing technologies. In the first round 37 projects were approved totaling just over \$7.25MM. The program is in the midst of the second round with 117 proposals received and \$7.25MM awards to be made. Education and work-force development are being conducted across the state within the Tennessee Solar Initiative project. Approximately 78 technicians have been certified to perform solar installations and workshops have been held in Memphis, Nashville, Chattanooga, the Tri-Cities area, Knoxville and several other cities. Our partners in this endeavor are ORNL, ECD and other state agencies. Mr. Stansberry asked if any of the Innovation grants have been strong enough to see growth results. Dr. Millhorn noted the first grants were awarded about four months ago and it is still early in the process for results. Reports will be filed, however, and progress will be tracked.

The Solar initiative does not have funding for fundamental research, Dr. Millhorn said. UT successfully applied to the National Science Foundation (NSF) last year for a \$20MM over-five-years grant that allows funding for fundamental research and discovery of new technologies for solar energy. This is the TN-Solar Conversion, Outreach, Research and Education (TN-SCORE) program. UT is the lead institution in the award and Dr. Millhorn is the Principal Investigator (PI). Dr. Stacey Patterson was the proposal grant writer and provides oversight for the project. Our partners are Vanderbilt, Oak Ridge National Laboratory, East Tennessee State University, Fisk University, King College, Middle Tennessee State University, Tennessee State University, Tennessee Tech University, the University of Memphis, Tennessee Technology Development Corporation, Genera Energy LLC, Hemlock Semiconductor, Soltility, Eastman Chemical, Wacker and TVA. Two of the program thrust areas are at UT and the third is at Vanderbilt. The thrust areas are looking at new technologies to convert solar energy into electricity. Private-sector organizations in the partnership are providing fellowships and internships for students to be involved in the process. The program is operating and moving forward.

Dr. Millhorn noted there is much concern at Oak Ridge National Laboratory (ORNL) regarding cuts to the federal budget and speculations in how these cuts will impact its programs. The DOE evaluations of ORNL are consistently high and ORNL is DOE's premier and largest national laboratory. Despite the exceptional DOE ratings, several projects are in jeopardy and effort is being directed to protect programs critically important to the country and ORNL. One such program is CASL (Consortium for Advanced Simulation of Light Water Reactors), a DOE energy hub with ORNL as the lead institution and in which UT is a participant, which connects fundamental research and technology development through an integrated partnership of government, academia, and industry that extends across the nuclear energy enterprise. CASL was mentioned by President Obama in his State of the Union address this past January. CASL is creating and manufacturing prototypes of new-generation energy reactors. The CASL team applies existing modeling and simulation capabilities and develops advanced capabilities to create a usable environment for predictive simulation of light water reactions. These

prototypes save tremendous amounts of time and money through the designated virtual reactors. The next-generation computers will be more efficient, will contain less waste material, and will generate more electricity and power.

Also mentioned by the President in his recent State of the Union address is the UT-ORNL supercomputer, now #2 in the world (China has moved ahead to #1 at the current time). Regaining the #1 position will be accomplished by the DOE-approved next-generation supercomputer with a greater-than 2.3 petaflops (2.3 trillion calculations per second) and in line to follow is a new Cray 20PF supercomputer (to be called Titan and which will have peak capability of 20,000 trillion calculations per second). These supercomputers are mainstays in all of UT and ORNL's research programs.

The bioenergy program at ORNL is vulnerable concerning federal cuts. The BioEnergy Science Center (BESC) is funded by the DOE Office of Science. This program interfaces with UT programs to create new technologies in the bioenergy sector.

Dr. Millhorn noted that in the biofuels program a waste material called lignin is created. Lignin can be turned into carbon fibers and used in automobile and aircraft manufacturing and a multitude of other areas. Within the UT Biofuels Initiative is the largest supply of lignin in the world and the DOE-funded UT Center for Renewable Carbon (CRC) is making products using this material. Lignin today is what fiberglass was in the 70s, Dr. Millhorn said, and lignin is replacing many products made of fiberglass. It is a big opportunity for commercialization and in creating new jobs. Lignin is proving to be of higher value as a waste product than ethanol. Mr. Wharton asked if the UT Space Institute was involved in this particular carbon fiber research. Dr. Millhorn said they are not since the technologies are different in that the UTSI product is petroleum-based and the CRC product is from plant material.

In concluding his presentation Dr. Millhorn gave a few remarks regarding the 112th Congress and anticipated 2012 R&D budget outcomes. Dr. Millhorn noted that several UT administrators--including himself, Hank Dye and Buddy Mitchell--had spent time in Washington, DC, over the last month or so and no one knows at this time what budget outcomes will be. A favorable outcome would appear to be "gridlock" to enable continuation of the 2010 budget. There is solid UT coverage in DC but the budget path is not clear, with approximately 701 amendments to the budget at this time. The Office of Science & Technology Policy (OSTP) at the White House put out a letter to indicate 2012 will be a tough year and this revelation did not catch UT by surprise. Agencies are being asked to prepare for a 5 percent budget cut. The OSTP and the Office of Management and Budget (OMB) recently released a memorandum outlining 2012 priorities of the White House. Dr. Millhorn showed a slide which gave some of the Administration R&D priorities: promoting sustainable economic growth and job creation; defeating the most dangerous diseases and achieving better health outcomes; moving toward a clean energy future; understand, adapting to, and mitigating the impacts of global climate change; managing competing demands on natural resources,

based on sustainability and biodiversity; and developing technologies to protect our troops, citizens, and national interests. Dr. Millhorn noted UT participates at some level in each of these endeavors. It will be a difficult year and UT has begun formulating strategic priorities. Funds cannot be spent on projects that will not deliver results.

Mr. Horne asked if it mattered if UT-ORNL had the fastest computer in the world, i.e. dropping to #2 after China. Dr. Millhorn noted the supercomputers perform work essential for future development and to do the job required for modeling and simulating nuclear reactors and other extremely complex activities. It is important ORNL is the “go-to” place in the world to conduct this level of activity.

Mr. Talbot asked when the first building is expected to be out of the ground at Cherokee Farm and Dr. Millhorn stated it should be the first of June if all necessary state approvals are received. Construction will take 30 months to complete and the 145,000 square foot building will house the Joint Institute of Advanced Materials (JIAM).

Mr. Horne noted UT’s federal delegation changed significantly in the last election. In what regard, he asked, has this change affected philosophy, especially in regard to funding. Dr. Millhorn stated UT is always looking for partners with the same concerns and interests and this search involves other states as well as Tennessee. One quest is matching interests and understanding the kinds of activities taking place in other geographical areas and educating these potential partners with our own concerns and interests, i.e., educating them on why it is important to have the largest national laboratory and supercomputer, provide jobs in East Tennessee, have strong biomedical research activities in Memphis and so forth. Developing partners who agree on the importance of these activities is critical to UT and our state. Hank Dye noted more information on this topic will be provided in the Advancement Committee meeting. Mr. Horne stated he believes UT needs a strong presence in DC and this presence might include increasing staff members.

Mr. Stansberry thanked Dr. Millhorn for his presentation.

V. UTC Presentation on Community Partnerships—Outreach and Economic Development

Mr. Stansberry recognized UTC Chancellor Roger Brown to give a presentation on Community Partnerships--Outreach and Economic Development. Dr. Brown welcomed Board members and guests to Chattanooga and said UTC was honored to be host for these meetings. He noted the theme of Dr. Millhorn’s presentation focused on economic development and job creation and this is also the theme of the UTC presentation. Dr. Brown stated contributions in these areas are made through collaborations with great community partners and UTC is fortunate to have outstanding partners with which to make such significant contributions to the state. Dr. Brown introduced panel members who commit themselves to these kinds of contributions: Jim Brexler (President and CEO of Erlanger System), Jim Coppinger (Hamilton County

Mayor), Tom Edd Wilson (President, Chattanooga Chamber of Commerce), Richard Beeland (Assistant Mayor, City of Chattanooga), and Kim White (President & CEO, River City Company). Dr. Brown invited Ms. White to give remarks and noted the River City Company is a Chattanooga not-for-profit economic development corporation with a particular focus on keeping downtown Chattanooga vibrant and thriving. The River City Company had exceptional success in developing the 21st Century Waterfront Project and is diligent in keeping Chattanooga in the forefront of economic development and quality-of-life issues. Dr. Brown noted Ms. White is a recent President of the UTC Alumni Board and UTC is extremely proud of Ms. White as an alumna and of her many outstanding accomplishments.

Ms. White noted it was a privilege to talk to members concerning two things about which she is passionate: the City of Chattanooga and her alma mater of UTC. As President of River City Company she has, she said, the honor of getting up every day to work on issues to move downtown Chattanooga forward. An important strategy to accomplish this goal is the connection between UTC and downtown. UTC is important not only for the city but for the entire region. It is often stated there cannot be a great city without a great university and Chattanooga is indeed fortunate to have UTC. Companies frequently ask Ms. White how downtown Chattanooga rejuvenated itself and what is it that makes Chattanooga so special—what is “the Chattanooga way.” Building and leveraging great partnerships are key, she states, in this accomplishment, and the city and UTC are both successful in developing such partnerships. Ms. White gave an overview of “the Chattanooga story,” describing the city in the early 1960s as having the dubious distinction of being known as the “dirtiest city in the country” and in the 1980s as being in decline and a victim of suburban flight. There was no personality or character present in the downtown area and the city had turned its back on the (Chattanooga) river. Fortunately for Chattanooga, community leaders united in a vision to take an underutilized resource and turn the city into one of the nation’s most talked about success stories. The turn-around began with the Aquarium. The River City Company began as an organization to help make the revitalization plan a reality. In the 1990s building and growth continued and Chattanooga bought the country’s first electric shuttle to transport workers and tourists (and the shuttle is still free and still operating downtown). A downtown baseball field, world-class park, green spaces, movie theaters, and restaurants were built. In 2000 another business plan was formulated and the city was fortunate to have then Mayor Bob Corker seize the plan and run with it. In 2005 the 21st Century Waterfront Project was completed in less than 36 months without using tax dollars. This project is the crown jewel of the city and attracts over 2.3M tourists each year. There is world-class architecture, green spaces and connectivity for not only spaces but people and there are new development projects including downtown housing. Chattanooga is one of only three metropolitan areas that have grown in over four of the last ten years, with a population now of over 500,000 and a diverse economy with healthcare, insurance, transportation and education. As Dr. Brown put it so well, Ms. White said, Chattanooga has proven it is the “can do” city. Ms. White stated Chattanooga also has a “can do” university in UTC. As

the city grew and changed, so did UTC. In the past ten years enrollment at UTC has grown by 27 percent. The campus has over 10,000 students. Despite its phenomenal growth the campus has maintained its charm and its moniker of “jewel on the hill.” UTC students come from every county in Tennessee. In addition to UTC student quantity, UTC quality has also grown. Over the past ten years the average ACT score for entering freshmen has reached an all-time high of 23.8, surpassing the national and Tennessee averages. UTC students have received numerous awards and honors, including one Rhodes Scholar designation. While it is true many UTC alumni live, work and play in the heart of Chattanooga, alumni are found in every county in Tennessee, every state in the Union and in over 50 countries around the world; in addition, 28 percent of UTC graduates receive graduate or professional degrees. UTC is an engaged, metropolitan university committed to excellence and dedicated to meeting the needs of the region, Ms. White noted. These aren’t words—UTC “walks the talk.” As a metropolitan university, UTC students and faculty are integral parts of the Chattanooga community—learning, teaching and working for the betterment of the community. While doing so, UTC is preparing students to address the needs of metropolitan communities around the world. “Metropolitan” is really a philosophy and not a location, said Ms. White. UTC students can take the skills and experiences learned in this region and apply them to careers across Tennessee, the country and the globe.

At this point in the program a video clip was shown with UTC students and administrators and community officials and business leaders giving testimonies and examples of the excellent programs, attributes and experiences provided in the partnerships they share to promote economic development, job creations and the general betterment of the community.

At the conclusion of the video clip, Ms. White provided additional information of UTC’s economic impact in the community. UTC has injected over \$350M in the local economy and helped to create almost 6,000 jobs, she said. And, while the City of Chattanooga has been raking in national and international accolades, so has UTC. UTC’s engagement in the community includes additional learning opportunities for students, assisting faculty and research efforts in the region, and a focused concentration on a university role in economic development. UTC is concentrating on five key areas of community engagement: education, business and industry, public service, health and the environment, and “destination Chattanooga.” UTC has much of which to be proud in the area of education. The UTC School of Education is at the forefront of innovation in the teaching profession, earning recognition from the Carnegie Corporation, the Annenberg Foundation, and the Ford Foundation. UTC has been particularly recognized for its partnerships with the local school system in the establishment of a special math institute which prepares teachers for careers in urban schools and has programs created with an emphasis on science and technology and mathematics education. The doctorate program in Educational Leadership boasts an 80 percent attrition rate. Two examples of UTC’s partnerships with area education institutions are the Principal Leadership Academy, involving UTC, the Chattanooga Chamber of Commerce, local

businesses and Hamilton County schools, and UT's Chattanooga, an innovative program which encourages students majoring in science, engineering, mathematics and technical fields to consider a career in teaching. UTC's involvement in the community extends to a variety of academic programs committed to public service. The UTC Social Work Program received full accreditation status to offer an undergraduate degree and has plans to move toward graduate-level work in the future. This program boasts the 2010 Tennessee Social Work Student of the Year. The Center for Community for Education celebration celebrated its 30th anniversary in 2010. Fully funded by Pell grants, the Center has served displaced homeless, single parent, at-risk youth and others, helping more than 27,000 clients meet their goals in enhanced education and career access. Certainly, UTC is a real metropolitan university, addressing real needs in the community.

Ms. White provided examples of UTC's role in public-service partnerships: a UTC partnership with local law enforcement agencies creating the campus' first online degree in Criminal Justice; UTC's ROTC program, since 2007, providing a home for the U.S. Army's induction services; and UTC hosts a multitude of training and educational classes held in UTC facilities.

A video clip was shown giving accounts by students and community business and civic leaders of the services and assets UTC provides in promoting and enhancing positive economic development growth activities. In the clip Chattanooga Mayor Ron Littlefield describes UTC as a priceless commodity in focusing its resources and attention on the community and in enhancing economic development. Former Hamilton County Mayor and current Deputy to the Governor of Tennessee Claude Ramsey noted UTC as the trainer for future leaders of the community and region and as a source of pride in this development.

The UTC College of Business, Ms. White said, is one of only 6 percent of world-wide business schools to be accredited in both business and accounting by the Association to Advance Leading Schools of Business. For the fourth consecutive year, *Business Week* magazine ranked UTC's Undergraduate Business Program among the best in the nation and *The Princeton Review* listed the UTC College of Business among the top 300 programs in the country. The UTC SimCenter claimed designation as the National Center for Computational Engineering in 2007 and, since that time, the Center has been at the forefront in ground-breaking research revolutionizing and driving energy development. The Construction Management Program is a partnership between UTC and associated general contractors of East Tennessee. This program provides on-site learning opportunities and the association provides scholarships and internships. The Boom Box is a project of the National SimCenter, UTC, ETB and TVA, where a hydrogen fuel cell located atop the ETB building provides power to serve the building. UTC also has a long-standing commitment to area health care and health-care professionals. The UTC Department of Physical Therapy boasts a 100 percent pass rate of licensure exams and career placement. The UTC School of Nursing received a perfect score in its most recent accreditation review. UTC launched a Clinical Doctoral Program in January 2011

aimed at career nurses and critical care needs and it delivers much of its academic content online.

A video clip was shown with community and business leaders and UTC students and administrators testifying to UTC's value in the region, including Tim Walsh, president and CEO of SimCenter Enterprises; Jim Coppinger, Mayor of Hamilton County; Richard Beeland, Assistant Mayor, City of Chattanooga; Jim Brexler, president and CEO of Erlanger System; and Dr. Valerie Rutledge, UTC Director, Teacher Preparation Academy.

Ms. White also commented on "Destination Chattanooga," recognizing the important commitment of UTC to the arts, to the many areas of economic growth and quality of life centers enjoyed in the region, and to the new generation now building upon the heritage of Chattanooga. It is easy to see, Ms. White said, how the city and UTC are intertwined—Chattanooga has a great city and a great university.

Chattanooga Mayor Ron Littlefield, via video clip, noted there are roughly 500,000 people in the area, with three counties in Georgia and three in Tennessee. For planning purposes he tells people to think in terms of a million people; the University has exceeded 10,000 students and he advises UTC to look ahead to when its population will also double. Tom Edd Wilson, president of the Chattanooga Chamber of Commerce, noted UTC was a major factor in attracting Volkswagen and Amazon.com to Chattanooga. Mr. Wilson said Chattanooga now recognizes it can compete for the biggest projects in the world. UTC is helping prepare people for the work force and the future of Chattanooga. There is much investment in the area from the people in Chattanooga, there is an incredible university system, there is a high-performance computing center, and with the grid there is an infrastructure which places Chattanooga #7 in the world. Other people are now noticing what Chattanooga is doing and hoping to take lessons.

Ms. White thanked members for letting her play the role of "cheerleader" and said she hoped she conveyed a few of the things that make the community and the University so successful. Ms. White received a hearty round of applause. Chancellor Brown noted that UTC certainly counted Ms. White among its most valuable resources. Dr. Brown said he is proud of how UTC represents the University of Tennessee in the Valley and across the state, and he hopes members saw and heard a few of the ways UTC performs its core mission of educating Tennesseans and takes very seriously its roles of promoting economic development and jobs creation. Dr. Brown again thanked the panel members attending the meeting and noted these guests are among those who represent UTC's closest friends in efforts to make living in Chattanooga and in Tennessee better every day.

Mr. Stansberry thanked Dr. Brown for the excellent presentation.

VI. Celebrating Forty Years of Public Service

Mr. Stansberry introduced Dr. Mary Jinks, UT Vice President of Public Service, to give a presentation on Celebrating 40 Years of Public Service. Dr. Jinks said it was her pleasure to talk about the Institute for Public Service (IPS) and its role in economic development, jobs creation and helping UT's mission as a land-grant university and to share some of the stories and successes of IPS. When the University-wide Administration (UWA) was formed in the late 1960s there were several units within the University which provided specific public service and outreach activities. Dr. Ed Boling, then president of UT, had the vision to bring these activities together and form an institute to work with governments and industries across the state of Tennessee, much like the UT Institute of Agriculture assisted farmers across the state. His idea was to bring technical assistance, applied research, consulting services, information and training to Tennesseans. "We need to explore ways to achieve effective statewide delivery of the university's full resources, expertise and competencies to the business and governmental sectors of our state and to ensure constant statewide promotion and encouragement of research and service within the university system," Dr. Boling said in recommending formation of IPS. He called a special meeting of the UT Board of Trustees on August 18, 1971, and IPS was created. Former UT president Dr. Joe Johnson, Dr. Jinks noted, was also instrumental in creating the IPS organization. A video clip was shown of Dr. Johnson elaborating on the vision and rationale for the creation of IPS. The UT Municipal Technical Advisory Service (established in 1949), the Center for Government Training (established in 1963) and the Civil Defense Program (also established in 1963) were brought under the IPS umbrella to serve the entire state, providing--among other things--increased prestige and standing with the legislature in Nashville. Both IPS and the Institute of Agriculture were now in place to serve the state of Tennessee.

Dr. Jinks noted the Municipal Technical Advisory Service (MTAS) is the segment of the IPS organization which works with 346 incorporated cities across Tennessee. MTAS was formed in 1949 by state law as a joint partnership with the University, the state of Tennessee, and the Tennessee Municipal League. The Center for Government Training was formed by executive order of the Governor in 1967 to provide training services to state and local governmental organizations. The Center for Industrial Services (CIS) was established in 1963, also by state law, primarily to serve small and medium-sized manufacturing companies in Tennessee.

As the Institute grew over the last 40 years, Dr. Jinks noted, several other organizations came under the IPS umbrella, including the UT County Technical Assistance Center (CTAS) organization formed in 1973 and the Southeastern Community Oriented Policing Education Institute in 1997, later becoming the Law Enforcement Innovation Center (LEIC) in 2010. Leadership programs have existed since 1989, but came together as the Naifeh Center for Effective Leadership officially forming in 2009.

A power-point slide was shown with photos of a number of individuals who served in IPS leadership positions its history, including Sammie Lynn Puett, Tom Ballard and Bob Hutchison, who is considered the founding father of IPS.

In reviewing past IPS annual reports and other documents, Dr. Jinks said, the adage of “the more things change, the more things stay the same” comes to mind. In the 1975-76 annual report was this text: *One of the major thrusts of the Center for Industrial Services’ activities was directed toward energy management. The winter of 1976 imposed severe problems upon a number of firms and CIS responded with a series of energy-related workshops and numerous individualized counseling activities.* In 2010, CIS worked in partnership with the Tennessee Solar Institute to hold workshops around the state to promote the solar energy initiative to businesses and industries.

Dr. Jinks noted IPS is a relatively small organization with 165 full-time staff members; however, IPS uses faculty members all across Tennessee including Board of Regents’ schools as well as UT to help solve problems. The number of requests for assistance has continued to grow. In 1976 IPS agencies had 3,502 requests for assistance; in 2010 there were 25,504 requests. IPS is proud not just of the number of solutions they provide but also in the amount of economic impact of jobs created as a part of the work they perform. In fiscal year 2008 the economic impact of these projects reached \$1B for that year through its work with cities, counties and industries across the state. Dr. Jinks gave an example of how IPS contributes in such a significant way to the state’s economy and described a contract IPS has with the Department of Defense to assist in locating companies across Tennessee who make products in which the federal government is interested in buying. IPS identifies these companies and—through “bid-matching” processes—assists the companies in qualifying for and writing proposals to win government contracts to provide these products. In lean years IPS typically helps small companies across Tennessee win about \$250M in federal contracts; in 2010 this number was \$350M; and, this year, the number will likely be around \$650M, due in part to stimulus funding.

A large segment of the services IPS performs involves training. As noted earlier, Dr. Jinks said, from 1967 to 2001, the Center for Government Training was the mechanism for most of this training. Since 2001 each of the IPS agencies has taken over training functions and this remains a major service provided across the state. There is no mandatory training for elected county officials in the state of Tennessee; however, within the nationally-recognized County Officials Certificate Training Program, elected county officials receive specialized, office-specific, technical, administrative, managerial and leadership training to help them run their offices effectively. This program also offers a comprehensive knowledge of the inner-workings of county government. Since 1989 IPS has partnered with the state of Tennessee, through the Tennessee Government Executive Institute, to provide training for senior-level state government executives. In 2009 the Newly State Legislators Program began where newly-elected state senators and representatives come to Knoxville for an orientation workshop

including discussion about ways to transition from campaign to governing and important issues involved in government leadership roles. This program is conducted, Dr. Jinks noted, in partnership with the UT Baker Center for Public Policy.

The Law Enforcement Innovation Center (LEIC) and the Naifeh Center for Effective Leadership focus on providing professional development training for law enforcement personnel as well as local and state employees. In fiscal year 2010, LEIC served 1,726 training participants from Tennessee and 25 other states. One of the more well-known programs offered by LEIC, Dr. Jinks said, is the 10-week in-residence National Forensic Academy, which trains crime scene investigators on the latest techniques in crime solving. This program began in 2001 and has graduated 471 students representing 47 states and 1 foreign country (Iceland).

Dr. Jinks stated it was no surprise she was highlighting many of the outstanding accomplishments for IPS over the last 40 years. She thought the group might also enjoy hearing a perspective from an actual IPS customer in the private sector. Dr. Jinks introduced Mr. Darrell Edwards, vice president of operations for La-Z-Boy Tennessee. Mr. Edwards received his MBA from the University of Tennessee, Knoxville, and is also an alumnus of the Business School at Columbia University in New York. During his career Mr. Edwards has led various business organizations to achieve national and state awards of distinction in operational excellence, including being an Industry Week Best Plants Finalist for multiple years. Mr. Edwards said it was a privilege to speak about an organization of which he is most passionate, that being the Center for Industrial Services (CIS) at the UT Institute of Public Service. Mr. Edwards said he is both a supporter and a satisfied customer of CIS. He noted the success CIS has consistently enjoyed across the state in the implementation of its core mission to improve quality of life for individuals within Tennessee. Mr. Edwards noted CIS helps Tennessee manufacturers become more productive, more profitable and, ultimately, more competitive. The depth and breadth of the services and expertise of services ICS offers is world-class caliber, Mr. Edwards said. CIS provides important assistance to businesses across the state, including advice on safety and environmental issues, manufacturing technology, production operations, and government and economic development improvements. CIS consultants and advisers have vast real-world experience and the leverage to use other world-class resources such as faculty at the University of Tennessee and Tennessee Board of Regents' schools. CIS sponsors and supports many important programs, Mr. Edwards noted, such as the Small Business Innovation Research (SBIR) and Small Business Technology Transfer programs. These programs are designed to assist companies receive awards and market their technologies to the government at the local, state and federal levels. In 2010 CIS held well-attended SBIR information seminars in each region of the state. CIS also hosts Tennessee's Procurement Technical Assistance Center (PTAC) where experts work with Tennessee businesses to secure contracts to market products and services to local, state and federal government agencies. In 2010 CIS-PTAC helped Tennessee businesses secure government contracts

totaling \$48.3M. CIS is an integral part of the Tennessee Solar Institute, discussed in an earlier presentation, and Mr. Edwards noted the importance of this initiative.

Mr. Edwards gave his personal perspective of CIS in regard to its interaction with La-Z-Boy Tennessee and noted CIS has helped retain jobs in Tennessee and has enabled his company to be more competitive at local and global levels. CIS has supported La-Z-Boy Tennessee by providing lean manufacturing concepts training, resulting in documented savings of over \$562,000 in seven projects alone. Additionally, through CIS ergonomic assessments, his company improved its overall safety and recently celebrated 4M hours without a lost-time accident. In 2009 and 2010 La-Z-Boy Tennessee was named by *Industry Week* magazine as one of the Top 20 Manufacturing Plants in North America, the first upholstering furniture manufacturer to ever receive this designation in over 20 years of that publication. CIS was instrumental in helping La-Z-Boy Tennessee achieve this distinction. Mr. Edwards concluded his remarks by saying he hoped he had conveyed why he and his company are such avid supporters of CIS and he thanked members for the opportunity to address the group. Mr. Edwards received a round of applause and Dr. Jinks thanked him for his presentation.

Dr. Jinks noted--as did Dr. Millhorn, she reminded members--indications are that 2012 will be a challenging year in Washington, DC. IPS' two most successful programs within the Center for Industrial Services are federally funded. IPS is hopeful to maintain the level of its outstanding services under the anticipated funding and program cuts. In closing, Dr. Jinks noted distribution had been made at the meeting of the IPS history brochure created to celebrate its 40 Years of Public Service. Each year IPS provides Board of Trustees members a fact sheet describing specific projects and their impact in the area of the state where each Trustee resides. Dr. Jinks noted IPS partners with the Tennessee Department of Economic and Community Development and its Three-Star program to offer the Tennessee Basic Economic Development Course, designed for those who participate in economic development at local, state and federal levels and focuses on the fundamental concepts, tools, and practices needed to succeed in a complex economic environment. This course has been highly beneficial for cities and counties across Tennessee to improve our communities. Livingston City Mayor Curtis Hayes, a graduate of this course, had planned to speak of the success and benefits of the program but, Dr. Jinks relayed, a death in Mr. Hayes' family prevented him from attending today's meeting.

Mr. Stansberry thanked Dr. Jinks for her outstanding presentation.

VII. Update on Center for Interdisciplinary Research and Education (CIRE) and the Ph.D. Program in Energy Science and Engineering

Mr. Stansberry recognized Dr. Cheek to introduce the agenda item of the Center for Interdisciplinary Research and Education (CIRE) and the Ph.D. Program in Energy Science and Engineering (ESE). Dr. Cheek said it was a pleasure to have the opportunity to

provide an update on CIRE and the Interdisciplinary Ph.D. program. He reminded members, at roughly this time last year, the General Assembly met and Governor Bredesen approved the Compete College Act of Tennessee. Within this Act a challenge was made to the University of Tennessee at Knoxville (UTK) and the Oak Ridge National Laboratory (ORNL) to create a Center for Interdisciplinary Research and Education and its affiliated Ph.D. Program in Energy Science and Engineering.

To meet this challenge, Dr. Cheek stated he and Dr. Thom Mason, Director of ORNL, formed a Task Force chaired by Dr. Jim Roberto of ORNL and Dr. Wayne Davis, UTK's Dean of the College of Engineering. The Task Force worked within specific charges and timelines. The Task Force report was implemented and CIRE was created after state legislation passed in January 2010 authorizing UTK to establish an academic unit for interdisciplinary research and graduate education in collaboration with the Lab. THEC approved the Ph.D. Program in Energy Science and Engineering in January 2011, likely the fastest time in which a Ph.D. program was formulated in UTK and THEC history. Dr. Lee Riedinger, UTK faculty member in physics and former ORNL Deputy for Science and Technology, has been appointed as Director of CIRE. CIRE currently has 38 faculty members, Dr. Cheek noted, and 43 graduate students will arrive in early March to interview for positions in the ESE Ph.D. program. By the end of the first week in March, decisions will be made and graduate fellowship offers will be issued to prospective ESE students. Dr. Cheek introduced Dr. Wes Hines, UTK Interim Vice Chancellor for Research and Professor of Nuclear Engineering, to give an overview of CIRE and ESE.

Dr. Hines described the "you build it, they will come" process in creating CIRE and in developing the ESE Ph.D. program. Specialty areas within ESE are: nuclear energy, bioenergy, energy conservation and storage, renewable energy, distributed energy and grid management, and environmental and climate sciences related to energy. Dr. Hines noted UTK has a Top 10 Nuclear Engineering Department; in fact, UTK ranked #1 with B.S. graduates in the entire country in 2010. Along with an extremely strong program in nuclear engineering, the UT-ORNL Joint Institute for Biological Sciences brings deep leverage to the areas of environmental and climate sciences related to energy. UT has been selected by the National Science Foundation (NSF) for an Education Research Center (ERC), the largest grant NSF awards, if NSF's budget is sufficiently funded this year to accommodate the award.

Dr. Hines noted within the Energy, Science and Engineering (ESE) Ph.D. program a doctorate may be earned either through the new Interdisciplinary ESE program or through a traditional Ph.D. program with a concentration in ESE. Elaborating on Dr. Cheek's introductory remarks, Dr. Hines noted, after the January 2010 legislative charge to UT and ORNL to establish the Center, CIRE program goals were to increase the number of UTK STEM Ph.D. students and particularly the number of STEM graduates, enhance research collaborations between UTK and ORNL, and solve problems of national significance in energy-related areas. By combining the educational resources of the state's largest flagship institution with the research capabilities of DOE's largest

science and energy laboratory, CIRE provides expanded opportunities for graduate students in energy-related sciences and engineering. CIRE aims to add 20 to 40 graduate students each year, moving the university closer to its goal of becoming a Top 25 research institution. Dr. Hines noted UTK's research numbers are below the average for Top 25 institutions, due in large part because the average Top 25 research institution is 50 percent larger than UTK. Growth through strategic partnerships is crucial for UTK to reach its Top 25 goal. CIRE leverages assets of Oak Ridge National Laboratory, including a \$1.4B budget, 4550 employees, \$500M invested in modernization projects, the world's most powerful open scientific computing facility, the nation's largest concentration of open-source materials research, operating the world's most intense pulsed neutron source facility, and managing the billion-dollar U.S. ITER project. ORNL has scientists eager to become faculty at UTK and space and resources at ORNL provide enhanced opportunities for research for UT faculty. The UT-ORNL partnership is a great win-win relationship.

CIRE now has 38 faculty members: 18 from UT, 18 from ORNL and 2 from the UT Institute of Agriculture. Within this group there are many different areas of expertise. Dr. Hines showed a power-point slide depicting photographs of five "star" CIRE nuclear energy scientists, two of which are Governor's Chairs. Other faculty within CIRE includes: 6 in bioenergy and biofuels, 3 in renewable energy, 6 in energy conversion and storage, 6 in distributed energy and grid management, 4 in environmental and climate sciences related to energy and 8 in cross-cutting areas such as materials.

Dr. Hines noted there are two types of fellowship programs within CIRE, the normal Ph.D. Energy Science and Engineering Interdisciplinary Ph.D. program and a UTK-ORNL Distinguished Graduate Fellowship program. Three Distinguished Graduate fellowships were awarded last year and another 20 fellowships are expected to be awarded this year. Dr. Hines described the recruitment process for CIRE students, noting recruitment had taken place at 30 top universities and Dr. Hines showed a slide listing these institutions. As a result of this recruitment and marketing efforts, CIRE received 101 student applications. Forty-five students were selected for interview and 42 students committed to interview for CIRE fellowships. As Dr. Cheek noted, students will arrive February 28 and will spend one day visiting ORNL researchers and seeing facilities and one day will be spent at UTK receiving an overview of the campus and visiting individually with scientists, faculty and department heads. Dr. Hines noted the remaining ~60 applications are under review for possible admittance to UTK departments. Mr. Wharton asked how many interviewed students will be invited to receive CIRE fellowships. Dr. Hines said the initial goal is 20-25 students for CIRE, and he believes the remaining group of interviewed students will likely be absorbed within UTK departments. The quality of students applying for the fellowships is outstanding, Dr. Hines noted, with 10 of the 43 students having a perfect GRE (800) quantitative score and one of these also having a perfect (800) verbal score. After the ORNL and UTK tours and interview sessions, faculty committees will meet and rank students on Thursday (March 3) and fellowship offers will be made on March 4.

Dr. Hines showed a slide listing universities represented by the group of student applicants. He noted it is one thing to recruit from outstanding universities; however, it is quite another thing to actually receive applications from students at these stellar institutions. Among the 30 universities represented by the current CIRE application field are several on the Top 25 target list such as The Ohio State University, Texas A&M, the University of Florida, Purdue University, Clemson University, the University of California-Santa Barbara, and the Universities of Illinois, Maryland, Michigan, North Carolina, Virginia and Washington, as well as four from UTK and two from industry.

Ms. Tanner asked the length of the program, from beginning to end, and Dr. Hines responded the program will take approximately four years (some students will have a year or year and a half of coursework at UTK and will then go to ORNL to finish the last two and a half years there; other students will do their research and coursework exclusively at UTK).

Mr. Stansberry noted it certainly seems UT's Top 25 research institution aspirations will run through the CIRE and ESE Ph.D. programs and Dr. Cheek replied they certainly did. Whenever the University of Tennessee's name is touted among top universities and 43 top-tier graduate students tell their colleagues they plan to go to the University of Tennessee and ORNL to interview for fellowships, Dr. Cheek said, the aspirations of UT are indeed elevated. Additionally, when a 1600-GRE student plans to come to Tennessee to look at its programs, this fact also registers. These prospective students are coming from high-ranking institutions to look at the UT-ORNL joint programs. Many will decide to stay at UT and ORNL to study and receive a Ph.D.; and, after receiving a degree, many of these individuals will decide to stay in Tennessee. The CIRE and ESE programs are major economic development drivers for the state of Tennessee. UTK is excited about these new programs, Dr. Cheek said, and in capturing this kind of intellectual capacity and using it, among other things, to build on the relationship with ORNL. These programs are major elevators for UT's aspirations of becoming a Top 25 research institution.

Dr. DiPietro noted the CIRE and ESE programs were "straight-uphill" kind of work and he commended the leadership of the Knoxville campus for its tremendous support and accomplishment. To create a Ph.D. program in the remarkably short amount of time it was done, he noted, is in the world-record category.

Mr. Stansberry stated the development of these programs speaks highly of the level of leadership reflected in this success.

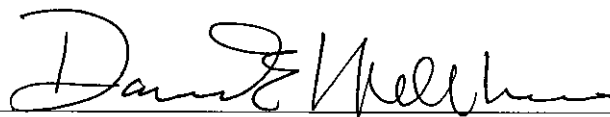
VIII. Other Business

Mr. Stansberry asked if there was any other business before the Committee and there was none.

IX. Adjournment

Mr. Stansberry thanked members for their participation in the meeting. A motion was made by Mr. Murphy to adjourn and Mr. Horne seconded the motion. The meeting adjourned at 12:10 p.m.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "David E. Millhorn". The signature is written in black ink and is positioned above a horizontal line.

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