

Minutes of the Research, Outreach and Economic Development Committee

The University of Tennessee Board of Trustees

June 20, 2008
Knoxville, Tennessee

The Research, Outreach and Economic Development Committee of the Board of Trustees of the University of Tennessee met on June 20, 2008 in the Plant Bio-Technology Building on the Institute of Agriculture campus.

I. Call to Order

Mr. Bucky Wolford, Chair of the Research, Outreach and Economic Development Committee, called the meeting to order at 8:30 a.m., EDT.

II. Roll Call

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

Mr. Bucky Wolford, Chair
Mr. George Cates
Commissioner Ken Givens
Mr. Doug Horne
Mr. Jerry Jackson
Ms. Andrea Loughry
Ms. Brittany McGruder
Mr. Karl Schledwitz
Dr. John Schommer

The following non-voting members were present:

Dr. John Petersen
Ms. Mary Kate Ridgeway
Mr. Paul Hart
Mr. Romeo Morrisey
Mr. Chuck Shoopman

Dr. Richard Rhoda, Commissioner Tim Webb, and Dean Dick Gourley were absent from the meeting.

Dr. Millhorn declared that a quorum was present for the meeting.

III. Approval of Minutes of the Last Meeting

Mr. Wolford asked if there were any corrections or questions in regard to the minutes of the last meeting of the committee which took place on March 12, 2008 in Chattanooga, Tennessee. Hearing no objections to the minutes; the minutes were unanimously approved.

IV. Review of Research Highlights

Dr. Millhorn stated the success of the research program is in the hands of the faculty. We should recognize the hard work they do to win grants, contracts and grow our research program. Our faculty has been very successful and it's our role to provide the capabilities and resources for them to succeed.

Chattanooga

Last March we had a celebration of the SimCenter obtaining its new title of National Center for Computational Engineering. This places the SimCenter in a unique position to compete and win grants of national importance. We are working with them to provide partnership activities with the computing center at the Oak Ridge National Laboratories.

Also in Chattanooga, about one year ago TVA deeded over the test track to UTC and it is available for testing in the area of automotive engineering. They are playing a role in setting up a test site for any automotive industry in the area. Chattanooga has a great opportunity as it comes on line as one of our major research facilities.

Knoxville

Last fall we announced our selection by the National Science Foundation (NSF) as one of four super computer centers. In a recent publication identifying the top 500 computers in the world, we are number 57. In talking with Dr. Thomas Zacharia, he believes that before the end of the year we will be in the top 10 with the UT computer which is part of the NSF super computing system. This computer will give us more research capability and more access to high powered computing that is needed in modern research.

UT Knoxville has been successful in receiving CAREER awards from the NSF and to date we have 12 active CAREER awardees. These are highly competitive awards and again it shows that we are recruiting top-notch young faculty who can compete for and win these awards.

A recent announcement that has not been made public is the intent of NSF to fund a new center under the leadership of Dr. Lou Gross called the Center for Research at the Interface of the Mathematical and Biological Sciences, CIMBS.

This is a \$16 million award and is brought to your attention because only one of these was awarded nationally.

Also, we compete for training opportunities for our students from the federal government. We now have two awards from the Integrative Graduate Education and Research Traineeship Program (IGERT) that is sponsored by the NSF. Cynthia Petersen and David Keefer are leading these programs. These programs will enhance the training opportunities for our graduate students in our science and engineering program.

The Department of Defense has awarded the UT College of Business a major award to assist them with the process management related to lean business principles.

UT also participates in the EPSCoR program. This program is for states whose research is not up to the national level. We are right on the cusp of graduating from that program because of the growth of our research but right now we are still eligible for these awards. An award that will be announced soon is for our Neutron Sciences program at Oak Ridge by investigators here at the university. Takeshi Egami is leading the effort for this \$2 million award to enhance the research by the university with the Spallation Neutron Source in Oak Ridge.

Institute of Agriculture

This institute continues to grow its research and is the component driving the biofuels effort. This is a \$70 million program and additional details will be discussed later. The most recent development is that the university, along with a commercial partner, has been awarded \$26 million from the Department of Energy (DOE) to assist us in developing a bio-refinery for cellulosic ethanol. This award has been announced and we are negotiating with the DOE and the commercial partner to finalize the award.

Also, the US Department of Agriculture has selected the university as one of its Sun Grant Centers. This is for growing biomass and we are the only southeastern center in the Sun Grant program.

Space Institute

Dr. Don Daniel has retired and Dr. Angie Buckley has been named the Interim Assistant Vice President. Dr. Buckley was the Vice Chancellor for Research and is continuing to grow that program. UTSI has an affiliation with NASA and is looking at ways to improve our space vehicle. The Department of Energy and UTSI are also working with atmospheric science, which fits with some other initiatives across the UT system.

Health Science Center

Health Science Center continues to grow their programs and has a great need to continue improvements of the infrastructure. One of our roles is to provide our scientists with the very best facilities. Plans are underway to build buildings,

however, the state's economic crunch has slowed this and we are looking for alternative funding methods.

One program we are trying to compete for is the Clinical Translational Science Institute from the National Institutes of Health (NIH). We feel it is important to win this and we are working to revise an application for resubmission to be one of the universities selected to host one of these institutes.

The Consortium for Integrated and Translational Genomics (the mouse colony) was developed by UTHSC faculty in collaboration with several other universities and is one of three focus areas for the UTHSC. We were able to acquire from the state some funding that was not cut from the budget to allow this program to continue to grow and be a major part of our biological program. This program was started in consortium by the UTHSC, UNC-Chapel Hill, Duke and several others. This mouse colony which is very unique for the study of diseases is housed at the vivarium in Oak Ridge. The money received will be matched by the DOE to keep that vivarium open and available to our investigators.

In September a new Cancer Research Building will be opened. The three finished floors are almost completely full.

Martin

The USDA supports the UT Martin Regional Entrepreneurship and Economic Development (REED) Center which assists small businesses in west Tennessee.

UT Research Foundation

The UT Research Foundation had a record number of disclosures this year, which means our investigators are identifying things that are worthy of protecting and patenting. One of the major functions of the Research Foundation is to work with our scientists on an individual basis to protect their discoveries so they can be turned into intellectual property and patents.

The faculty has worked hard and they have brought in grants under difficult economic circumstances and even in a good year, only 20 percent of applications are normally funded. In the past few years it has been only 10 percent. Cherokee Farms is a top-notch facility that will support our research efforts over the next decade that will be coming on-line, so that we can recruit the best and retain our best scientist.

Biofuels Program

We received an appropriation last year to build a Research and Development facility for cellulosic ethanol. The program we are looking at is in its infancy nationally and worldwide and takes non-food products develops into sugars and then converts it into ethanol. The Department of Energy has a new mandate for 36 million gallons of ethanol by 2015. This past year, Dr. Kelly Tiller and her team put under seed a region of approximately 738 acres around the proposed site in Monroe County near Vonore. The switchgrass is growing as a commercial

energy crop for the first time in Tennessee and on farms for the first time in this country. Next year we plan to put another 3,000 acres under seed, and the year after that another 4,000 acres under seed for a total of just under 8,000 acres that will be used to furnish bio-mass for the research development of cellulosic ethanol as a sustainable fuel alternative.

Last year we based our program on a partnership with a bio-tech company that was evaluated and concluded they had the best next generation technology. When we began this project, the estimated cost of a bio-refinery that could be scaled up to 20 million gallon from a five million gallon R & D capacity was approximately \$140 million. In the fall of 2007, it was determined that market conditions were soft and that the proposed plant needed to be reduced in scale to two to four million gallons per year to fit within budget. To fill in the funding gap, along with Mascoma as the primary applicant, we put in a grant application to the DOE to supplement the building of the bio-energy facility. We have been notified we are one of the winners of that grant and the only switchgrass awardee. In the meantime, we feel we are way out in front with our farmer switchgrass incentive program. We have spent time educating the farmers how to plant, grow, and prepare the fields. We have 16 farms within a 50-mile radius of the proposed bio-refinery site. We have selected farms of various qualities, with areas of 15 – 150 acres.

Recently, in agreement with the Attorney General's office, the UT Research Foundation (UTRF) has formed a company called Genera Energy, LLC. This entity will build and operate the bio-refinery. The money appropriated will pass from the university to the UTRF and then to Genera for the building and operation of the bio-refinery. To develop a private enterprise such as this, the university is not allowed any equity and this was the most flexible format we could have to be an R & D unit. Genera Energy has begun to acquire 32 acres in the Niles Ferry Industrial Park in Vonore, Tennessee, and they continue to negotiate with Mascoma as a technology provider.

Mr. Wolford commented this was an excellent report. Mr. Wolford asked if this type of report was being shared with the state and how is that being handled? Dr. Millhorn responded that he was sharing this information with the constitutional officers of the state last week and they will be updating reports to the State Building Commission in August or September.

Mr. Wolford asked about the acquisition of property and if the option is still open. Dr. Tiller responded that the option was originally open to Mascoma and the option has expired. We are now in the process of negotiating to purchase.

Mr. Wolford asked if we were paying a subsidy to farmers and does this cause any problems in the future. Dr. Millhorn responded that we have entered into agreements with those 16 farmers to pay \$450 per acre and we pay the transportation costs. We currently own the switchgrass and after this year we will

probably move to a per ton subsidy. It was also asked how the subsidy was funded and also about the impact of the federal subsidies at this point in time. The subsidies we have in place now are being paid from the appropriations that were earmarked for that function. Dr. Tiller has been keeping up with the federal subsidies on a daily basis. She stated that the program developed by UT has been used as a model by the USDA. The new bio-mass incentive program by the USDA does all the same things that UT's program is doing. The land being utilized for the switchgrass is under-utilized land and does not take away from food production land.

Ms. Loughry asked about additional counties being involved. Dr. Tiller indicated there are currently seven counties within a 50-mile radius that are being seeded with switchgrass.

Mr. Karl Schledwitz asked where the shortfall was coming from in regard to Mascoma's shortfall in fundraising and does this mean we are renegotiating our deal with Mascoma? Can we access the \$61 million from Mascoma and has Mascoma contributed any money or federal grants at this point? Dr. Millhorn responded that we have downsized the bio-refinery to a \$60 million amount, with \$26 million from DOE and the \$40 million, which is sufficient to build the plant for R & D purposes but is not scalable to the original size projected by Mascoma. Payments from Mascoma going forward would be used to offset some of the operating costs and royalties on products sold.

Mr. Schledwitz asked if Mascoma was no longer contributing to the brick and mortar of the plant. Dr. Millhorn replied that they are in terms of assigning the grant from DOE which would go to Mascoma, then flow through Genera to build the plant. Mr. Schledwitz understood that Mascoma is a conduit for the federal funds to Genera, and Dr. Millhorn replied that was correct. Mr. Schledwitz asked if Mascoma was putting up any money and Dr. Millhorn replied since negotiations are still underway, it can be said that Mascoma is developing the technology.

Mr. Stansberry asked if the involvement of DOE money impedes our efforts to create a revenue stream or if the intellectual property (IP) developed is in the public domain. Dr. Millhorn responded no, that the monies were to support activities to demonstrate nationally we can develop a cellulosic biofuel program. We have no indication that we'll have to sign over any IP to DOE or that they will impair our ability to commercialize.

Mr. Stansberry also asked if the \$450 per acre for switchgrass that you take and sell for fuel, roughly what is the loss? Dr. Tiller indicated we were looking several options to sell the switchgrass to other fuel producing plants, with a range of approximately \$40 - \$70 per ton. At the higher end we would be coming out ahead.

Mr. Horne asked why not limit Mascoma's percentage? Why not UT own the franchise? Dr. Millhorn responded that 100% ownership of the bio-refinery belongs to Genera but couldn't discuss all the details due to on-going negotiations with Mascoma.

Mr. Carroll asked what guarantee do we have regarding the \$40 million from the state. Dr. Millhorn replied this money was not cut from the Governor's budget for the upcoming fiscal year.

V. Cherokee Farm Campus Update

Dr. Millhorn discussed the Cherokee Farm Campus project, located on the old dairy farm across the river from campus, with committee members noting the goal is to develop this property as a state-of-the-art science and technology oriented research campus that will:

Promote interdisciplinary research in areas that are of state and national significance, take advantage of unique resources and partnerships to lead "programmatic" initiatives, and enhance the University's ability to promote economic development within our state.

Dr. Millhorn discussed the feasibility study conducted by EDAW, an architect and engineering consulting firm this spring. We conveyed our vision that this campus would have up to 2 million square feet of office space. We also asked that the land be kept as a point of pride for the community, that all buildings will be LEEDS certified, and that the property would be a gateway into the city and a landmark for our community. We want to change the perception of the university, city and state as a whole, that we are high tech, national leaders, and this campus will help us make this statement.

The summary back from EDAW is very encouraging. UT is in an ideal position to develop the Cherokee Farm Campus as a state-of-the-art, technology-oriented research campus. This campus can take a national leadership position in innovative research, which is very important. The campus can enhance the University's ability to promote economic development and take advantage of unique resources and partnerships. We are still in the intermediate to advance planning stages.

Mr. Schledwitz commented that great steps had been made and applauded the efforts of the University officials.

Mr. Horne asked about the buildings, whether they would be leased, buyback, etc? Dr. Millhorn said that in both cases, Memphis and Cherokee Campus, we were working with state leaders on what was allowable. If you depend on state appropriations totally, it's hard to envision this type of project. We are looking at alternative ways to finance. We have investigated with Cherokee Farms, one

private building proposed and we can do a lease arrangement with them where the building would be built on state property and leased to this company.

Dr. Schommer asked if the Knoxville colleagues and faculty were involved. Dr. Millhorn replied, yes they were. We have three levels of committees and we are getting ready to gather a master plan committee and we will be asking for faculty involvement. We have a community group as well and we are trying to get as many groups involved in this vision as we possibly can because of the impact on the entire community.

Ms. McGruder asked about the recreation field compromise possibility. Dr. Millhorn indicated there would be passive recreation on this land in the green areas. There are no plans for formal, lighted fields due to the community's objection. The university is seeking other alternatives for the recreation field requested by students.

VI. Economic Development Impact of Institute of Public Service (IPS)

Dr. Mary Jinks shared with committee members how UT's economic development work aligns with its mission of teaching, research and service. IPS works with governments across the state, with existing industry across the state on a wide variety of projects, and with entrepreneurs with ideas for start-up companies. With a small staff in IPS they brokered partnerships with the UT family and with organizations across the state to accomplish this mission. Dr. Jinks provided examples of these partnerships citing a report IPS worked on for the UT Institute of Agriculture regarding the impact of retirees moving into the state of Tennessee. Other projects involved partnering with UT Knoxville faculty on a wide range of subjects including the manufacturing in the state and how we can prepare the companies and workforce in Tennessee for future years. IPS has also worked with UT Martin regarding the impact of Reelfoot Lake with regard to a new interstate system and resulting watershed issues. Another program was in the small business innovative research proposal assistance center, where they work with people from Chattanooga and the Research Foundation all across the university, helping those small companies get research funding from the federal government to grow companies in Tennessee.

IPS is also involved with state, regional, and local partnerships including Southern Growth Policies Board, UT-Battelle, Knoxville Oak Ridge Innovation Valley, Tennessee Department of Economic and Community Development, Department of Tourist Development, Tennessee Department of Labor and Workforce Development, Integrated Manufacturing Technology Initiative, Tech 2020, and Mind2Marketplace.

Dr. Jinks told the group about a company, a Bucksport manufacturer, who needed assistance in becoming ISO certified. As a result of IPS' assistance, this company has been able to bring in \$20 million in new business to the area. In

Smithville, they have a company who paints automotive parts and they wanted to grow their company. Their challenge was environmental compliance. The IPS environmental team assisted them in getting compliance and they are now a Tier 1 supplier for Mercedes and have doubled their workforce at that location.

Another focus for assistance is with cities and counties across the state. The City of Gallatin was struggling with the economic development organization. It turned out after a review by IPS that they had a very strong organization, but needed assistance in implementing some of the recommendations. Also, a Seymour inventor with a technology to x-ray the roots of plants needed assistance. IPS worked with him to find federal funding to grow his research, so he could grow his company into a more viable organization in Tennessee.

The economic impact of IPS is shown by an increase of \$403 million in 2005 to \$868 million in 2007 reported by the customers of IPS. Also, another area they look at is the amount of jobs added or retained.

Mr. Wolford thanked Dr. Jinks for the valuable information.

VII. Annual Report of the UT Research Foundation (UTRF)

Dr. Fred Tompkins presented the UT Research Foundation annual report to the committee. He reviewed the four main focuses of UTRF: (1) support the research and development missions of the University, (2) harvest, manage and market intellectual property, (3) encourage and support entrepreneurial ventures and (4) drive economic development, especially technology based ventures.

At the last committee meeting, a change to the makeup of the Board of Directors was discussed. The original board contained 14 voting members, 7 external – nominated by the President and approved by the Board and 7 UT affiliated members from the UT community appointed by the President. The UTRF Board voted to expand the board membership by adding two trustees and two additional external members, to keep a balance on the board. These four new members would be non-voting members.

Also discussed was a change in the UTRF revenue sharing policy adopted by the UTRF board which became effective with invention disclosures received by UTRF after June 30, 2008. As an incentive to faculty involvement in this process, since not every technology is a home-run, the revenue sharing formula gives the first \$5,000 in gross revenue collections to the inventor(s). For revenues generated between \$5,000 - \$1 million net of expenses, a distribution formula will be followed: 40% to the inventor(s), 15% to the campus/institute, 15% to the department/lab and 30% to UTRF. Above \$1million net cumulative the formula would be: 35% to the inventor(s), 20% to the campus/institute, 20% to the department/lab, and 25% to UTRF. Revenues generated from agreements in place prior to July 1, 2008 will be distributed as follows: 50% to the inventor(s),

15% to the campus/institute, 15% to the department/lab and 20% to UTRF. The revenue distribution plan involving disclosures before July 1, 2008, triggers when UTRF has amassed \$2 million in reserves, and if the reserves fall below \$1 million, the distributions would halt until reserves again reach \$2 million.

Dr. Tompkins described several examples of how UTRF has leveraged the intellectual property to create or continue a research stream of funds into the university.

A new initiative for the UTRF this year was the funding of a technology maturation program. Eleven faculty teams were competitively chosen and received funding for their technology programs to position them for licensing. The total maturation investment was \$180,000, and a report should be forthcoming from each recipient about their findings and accomplishments.

Our faculty have performed admirably in FY 2008. UTRF has received 93 invention or creation disclosures this year, and this is a record number. 52 patent actions have been filed and 15 patents have been issued by the US Patent and Trademark Office. UTRF provides legal review for intellectual property clauses in research contracts and regularly negotiates terms of Materials Transfer Agreements. A significant amount of the UTRF's activities support the university's research mission.

Mr. Driver asked about the Space Institute and their role in these disclosures. Dr. Tompkins responded that a portion of their research may happen jointly with the UT Knoxville College of Engineering, and that disclosures may be reflected in statistics of another campus or institute. However, there was not a disclosure in this fiscal year that was specifically identified as being solely from UTSI.

UTRF had a record year in license revenue with \$4.4 million collected. Mr. Stansberry asked about a report they were given that reflected revenues of \$1.9 million and asked the reason for the difference in the numbers. Dr. Tompkins offered to review the items and get an answer back to Mr. Stansberry and the remainder of the committee.

Dr. Tompkins indicated there were three extraordinary events in FY 2008 that contributed to this large amount of revenue collections. Our projections for next year would be more conservative approach. As of this date UTRF has distributed to our faculty inventors, \$1.88 million in this fiscal year. UTRF also had one successful patent infringement action this year.

Two new companies were formed in FY 2008: Computable Genomix based in Memphis and Genera Energy based in the Knoxville area. Mr. Horne asked if UTRF would get pay back from Genera Energy. Dr. Tompkins answered that as new technologies are developed by faculty doing research and those are licensed to Genera, then we will collect revenues and give back to the faculty.

Mr. Horne asked if we were trying to break even or be in the black with the UT Research Foundation. Dr. Tompkins said we are trying to operate in the black and to create a revenue stream to share with the university. If you look at the technology transfer and research foundations around the country, you will find such operations, while built on meeting compliance needs, usually focus first on service to their affiliated universities and then trying to make money.

Mr. Horne asked if the UTRF operated in the black before 2003. Dr. Tompkins responded that UTRF inherited about \$1.5 million debt from the UT Research Corporation.

Mr. Stansberry asked if someone keeps track of revenues and expenses of the UT Research Foundation, and asked for a report, if available. Dr. Tompkins said he would provide this information to Mr. Stansberry. Dr. Tompkins also noted that UTRF finances had been audited annually by a state approved firm and that audit reports from previous year had been filed as required with the State.

Mr. Jackson asked about earlier information received that shows support from the UT of almost \$1.8 million to UTRF in FY 2008. Dr. Tompkins indicated that UTRF staff members are in fact employees of the University of Tennessee on loan to UTRF. Thus, the \$1.8 million UT allocation covers the cost of employee salaries and benefits, plus provides some basic operation funds. UTRF employees provide a menu of research support related services back to the University. UTRF funds its intellectual property and legal work out of funds it finds elsewhere. Last year's legal budget was about \$1million, and FY 2008 was about \$1.6 million.

Mr. Wolford asked that the reports Dr. Tompkins is sending to Mr. Stansberry be sent to not only committee members but the rest of the Board of Trustees as well. Dr. Tompkins indicated he would provide this information.

Mr. Schledwitz said he was glad to see a method to retroactively allocate funds for disclosures prior to July 1, 2008 and inquired how UTRF would achieve a \$2 million reserve if we were subsidizing almost \$2 million a year. Dr. Tompkins said that we would have more than one profitable year and we would have to be cautious and guard our spending. Mr. Schledwitz asked if we have had a profitable year, including the subsidy from the campus. Dr. Tompkins indicated that was correct.

Mr. Horne asked if the formulas for revenue sharing at other foundation are comparable to our formula. Dr. Petersen indicated that yes, this was the case.

Mr. Wolford commented he was concerned about the non-voting status of the two new external members and inquired if the board member appointments were rotating. Dr. Tompkins commented it was a 3-year term. Mr. Wolford inquired if

there was an understanding that UTRF was supposed to be a profit generating entity, if so who's judging the success, and is there a performance evaluation of the President of the Foundation.

Ms. Loughry responded that yesterday she had requested a committee be formed to examine all UT foundations and suggested the voting status of the new UTRF board members be sent to this new committee for review.

Mr. Schledwitz agreed and indicated he needed to understand the rationale for having the new UTRF members be non-voting. He said that although great strides had been made, there were still some serious questions that need answers and asked that the committee postpone approval of the Operating Agreement. Mr. Schledwitz also commented that in reading the agreement, the governance structure was unclear: Is the UTRF board a policy making board or is it accountable for performance? Is the UTRF board responsible for hiring and firing the President of the Board? Also, there is no mention in the document about the accountability to the campuses. Mr. Schledwitz moved to table the vote on the Operating Agreement, and Mr. Jackson seconded the motion.

Dr. Petersen commented on the flexibility with Foundations in regard to governance. Mr. Schledwitz felt that if you had the Foundation at arms length, but it was staffed 100% with UT employees, who were they accountable to?

Mr. Schledwitz moved that the Operating Agreement be deferred until the new committee being formed has a chance to review some of the questions. Mr. Jackson seconded the motion. The motion was approved.

The meeting was adjourned at 11:00 a.m.

Respectfully submitted by:

David E. Millhorn