

Recommendations Resulting from the First KU Summit
on Sustaining the Planet; Powering the World
A Report to the Provost

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Prologue

“Life is like riding a bicycle. To keep your balance, you must keep moving.”
— Albert Einstein

This report is about balance between teaching and research and keeping KU moving toward excellence. Some people concluded that this summit topic is about “climate change” and “energy,” but it is about much more. It is about how to live within our means while also continuing to be productive in a sustainable way as a research university.

One conclusion drawn from discussions before and during the summit is that KU has much to offer in assessing the condition of the planet and developing energy technology and social solutions to the problems we have created in a highly industrialized society. This may involve designing new communities and infrastructure that are supportive of aging populations while also designing new energy sources that are more sustainable and less impacting on our environment. This has to be done in balance, which is why it is important to bring scientists, engineers, social scientists, and faculty in the arts and humanities together in a collaborative environment. This was the purpose of the first strategic planning summit.

This report begins with an executive summary followed by a more detailed discussion of the steps that can be taken to move KU forward in becoming an outstanding and respected university nationally and internationally. Recommendations are provided that, if followed, will lead to significant growth in external research funding across all schools and disciplines and ultimately will result in improving the research status and respect of our faculty and students nationally and internationally. Of course, the overarching theme is sustaining the planet and powering the world, but most if not all of these recommendations will apply to all of the summit themes.

Executive Summary

Recommendations - Recommendations to strengthen the university's critical mass and infrastructure.

- KU should build on its strengths in climate change and environmental impact assessment research as well as its research on energy systems, power production, alternative fuels, ancillary biofuel products, and reducing the impacts of conventional fuels. In addition, the university has valuable historical information and perspectives on biodiversity in its premier Natural History Museum as well as a world-class humanities program that provide a basis of establishing a multidisciplinary sustainability research program. This should be the first multidisciplinary research program established under the overall KU Strategic Planning Initiative. Leadership of this initiative should be carefully selected to assure management bridges the humanities, the natural and physical sciences, business school, law school, and the engineering sciences in an impartial manner. This initiative should be the model for other interdisciplinary collaborations to follow.
- An important recommendation that resonates throughout the results from the first summit is to create a forum that brings faculty members together to form interdisciplinary teams having common research interests. Several suggestions were made as to the nature of this forum: establishing an institute linking sustainability, environment, and society to spotlight KU's disciplinary strengths and connections and support speakers, working groups, and multidisciplinary research and teaching teams; creating a faculty club focused on promoting mutual interests among faculty; hosting monthly faculty social discussions on new funding opportunities; and organizing multiple TGI Friday discussion events with light refreshments to promote interdisciplinary interactions. In addition, participation should be strongly encouraged by all schools and departments as the catalyst to begin cross-disciplinary team forming and as a means for scholarly advancement.
- KU needs to create a liaison support system separate from KUCR that facilitates creation of multidisciplinary teams, identifies opportunities for outside funding, seeks interested faculty, facilitates collaboration among faculty, and has the ability to provide seed money to support development of initial capabilities by freeing up faculty time to develop proposals. In addition, KU needs to identify an individual or group whose full-time responsibilities involve entrepreneurial activities, including identifying and marketing potential sponsors, identifying funding sources, and approaching potential partners with KU, including other universities and industry that strengthen KU's academic and financial standing.
- KU's promotion, tenure, and faculty evaluation systems need to reward multidisciplinary research efforts as much as solitary disciplinary research. This change in policy should include assuring equity among departments in allocating teaching and research loads among junior and senior faculty by reducing teaching loads according to level of research activity. A standard policy on course buy-out should be established. In addition, financial incentives need to be created that allow entrepreneurial faculty to receive additional compensation beyond summer salary for promoting multidisciplinary research. Compensation should be based on the level of responsibility for managing research projects, particularly if the projects involve millions of dollars and many faculty members and students.

- KU needs to develop a faculty training program that introduces new and senior faculty to a variety of potential sponsors beyond NSF and NIH, such as the DOD, DOT, DHS, EPA, USDA, NASA, DOI, DOC, Department of Education, the National Academy, private foundations, private industry, and state economic development agencies, such as the Kansas BioScience Authority. This training should include how to use grant writers, develop research plans, estimate costs, prepare budgets, and conduct marketing. It should also cover the importance of keeping sponsors informed about progress or lack thereof and keeping sponsors happy and willing to provide additional funding.
- KU should develop a new faculty hiring program that focuses upon coaxing outstanding mid-career and distinguished professors to come to KU that will enhance KU's academic standing, research leadership, and boost KU's potential to secure large and important programs in global change and sustainability research. The program might start by inviting distinguished faculty to visit for a semester or a year in the hope that the pleasant living environment of Lawrence will entice them to stay. Free housing should be provided along with other amenities such as free admission to campus events, the Flint Hills Symphony, or other venues such as KU basketball games. Faculty involved in the sustainability and energy research initiative should take the lead in identifying candidates that would be asked to visit KU for at least a semester. These visiting faculty members would be shared across relevant schools and departments.
- KU should consider other investment models to provide new infrastructure and research equipment for research activities. While some infrastructure is adequate for present levels of research, more facilities and equipment will be needed to move to a new level of research funding. The new engineering building will meet part of this need but other schools and departments are struggling with outdated buildings and equipment. Tax credits being offered in the new federal budget could encourage partnerships between KU and industry. These partnerships would allow industry to donate new research equipment that could be used by the industry as well as students and faculty. Also, new privately built and lease arrangements used at other universities for buildings and equipment should be investigated.
- KU should develop a teaching and undergraduate research program that facilitates team teaching across departments and schools focused on introducing students to interdisciplinary research involving global change and energy issues. A fair and equitable credit system must be derived to balance course loads, which are often different in the schools and across disciplines, particularly in the social sciences, arts, and humanities in comparison to the sciences. It is important that KU introduce students to the multidisciplinary nature of today's challenges in global change and sustainable energy systems, and consider offering multidisciplinary degrees and certificates in climate/energy/environment at all levels.
- Finally, taking a page from the Department of Energy's Laboratory Directed Research and Development (LDRD) program, it is recommended that KU develop a similar University Directed Research and Development (UDRD) program that would provide vital research and development funds for university faculty members to support high-risk but potentially high-value initial research. The UDRD fund would be funded using a small portion of the current 47 percent overhead charged on all research conducted at KU. Initially the amount would be 3 percent split proportionally between the Medical Center and the Lawrence campus. It is also recommended that a match to the 3 percent be provided from the annual return on the KU Endowment Fund. Based on current estimates, these combined funds could provide approximately \$6 million to

support the development of new research projects. All of these funds would collect no overhead except for a small administrative charge.

Introduction

On November 18 the first of four Strategic Planning Summits was held in the Commons of Spooner Hall. It was well attended by KU faculty with over 200 people volunteering their time and energy to help make KU a great university. Not to say that KU is not already an excellent university but the collective desire is to make it better and thus, the purpose of the four summits.

The theme for this summit was “Sustaining the Planet, Powering the World,” which subsumed under one heading at least 16 of the 104 strategic initiatives proposed earlier this year. The theme has been construed to be solely about climate change and energy, but it is about much more, including water and land resources, biodiversity, human perceptions of the environment, energy conservation, environmental restoration, energy efficiency and conversion, transportation, and the production of environmentally benign fuels. In short, it is about how to utilize the earth’s finite resources in a sustainable manner.

The first summit was planned and coordinated by:

Bob Honea, Co-Chair, Director, Transportation Research Institute
Joane Nagel, Co-Chair, University Distinguished Professor of Sociology
Judy Wu, Co-Chair, Distinguished Professor of Physics and Astronomy
George Bittlingmayer, Wagnon Distinguished Professor of Finance
Luis González, Professor and Chair of Geology
Craig Lunte, Professor and Chair of Chemistry
Simran Sethi, Associate Professor of Journalism
Joy Ward, Associate Professor of Ecology and Evolutionary Biology
Lawrence Weatherley, Spahr Professor and Chair of Chemical and Petroleum Engineering
Stacy Swearingen White Associate Professor of Urban Planning
Don Worster, Joyce and Elizabeth Hall Distinguished Professor of U.S. History

Assisted by:

Mary Lee Hummert, Vice Provost Faculty Development, Professor of Communication Studies
Mabel Rice, Fred and Virginia Merrill Distinguished Professor of Advanced Studies
Paul Klute, Office of Institutional Research and Planning

The complete agenda for the first summit can be found in the appendix, but basically the summit was divided into two sessions. Short presentations by selected committee members and the leads of several strategic initiatives comprised the morning session. At noon, five of the KU Deans conducted a panel discussion over lunch to explain how they would fund new multidisciplinary initiatives, assure that the initiatives cut across schools and departments, and handle joint hires across schools, departments, and research centers. Three breakout sessions comprised the afternoon session with the purpose being to: (1) review and refine the SWOT analysis, (2) identify potential projects and leaders in “Sustaining the Planet, Powering the World,” and (3) suggest organizational, infrastructure, and human investments to develop new research projects.

The following is a compilation of the results from the breakout and discussion sessions at the summit. All of the revised SWOT analysis and other raw data used in this compilation can be found in the appendix.

Revised SWOT Analysis

Building on Strengths – KU has tremendous capabilities in environmental and ecological assessment both from a historical perspective as well as from current research activities. For example, KU’s remote sensing research program, CReSIS (Center for Remote Sensing of Ice Sheets) builds on a 50-year-old research tradition that began with a NASA research program at KU in the early 1960s. It continues today with unique developments such as the Meridian Unmanned Aerial Vehicle, designed and built by KU students and faculty to use side-looking radar, also designed and built by KU students and faculty, that can penetrate 4 kilometers of ice to detect bedrock and measure ice thickness.



Our paleo-archeological research program housed in KU’s Natural History Museum has unparalleled understanding of past environments and can lead the way in forecasting what future landscapes and ecosystems will look like as climate change progresses. The humanities can also make contributions to our understanding of past environmental histories, lest we forget that as Shakespeare said “what is past is prologue.”

In spite of complaints of too many “stovepipes,” KU faculty have proven many times that diverse disciplines can come together and form interdisciplinary teams to team-teach environmental sustainability and to explore how to produce new fuels and valuable chemical products from renewable feed stocks. For example, the Feedstock to Tailpipe Initiative began as a student driven effort to clean up tailpipe emissions from outdated campus buses by utilizing waste cooking oil to convert to biodiesel that is now used campus-wide. The biodiesel conversion facility is run by volunteer students. We are also exploring how to do more with what we have in prolonging the life of our infrastructure such as roadways and bridges, and we are inventing and testing new materials that provide better energy conservation and durability of our roadways. There are other examples of multi-disciplinary research

and teaching teams on campus funded externally (mainly by NSF): CReSIS, CEBC, IGERT. KU should have many more of these kinds of innovative collaborations, and we need infrastructural and administrative support for faculty leading these efforts.

These research projects have led to new products and patents that have benefited both KU and society. We are committed to economic growth while at the same time valuing human life and seeking to assure that we prolong lifespans and facilitate productive lives. Our reach is even international in that a large number of our students and faculty have international experience in environmental assessment and developing scholarly collaborations. This is a strength we need to promote and expand. It is becoming almost impossible to travel to any part of the world and not have people recognize the Jayhawk logo and comment on some fond memory of KU. It is important to note that more than 40 percent of the world's general aviation aircraft are manufactured in Kansas, and KU has one of the oldest aerospace engineering departments (1917) in the U.S. KU's emerging alternative biofuels research program is critically important to the state's continued domination in aviation, and we were the first in the U.S. to test the viability of bio-diesel as an alternative fuel in a diesel aircraft engine.

In summary, KU has strengths both in the assessment of the health and viability of environmental systems related to global change and sustainability as well developing clean power systems to cope with undesirable consequences. The first strategic planning summit supported our premise that we should continue to highlight the things we do well and build on these strengths. In part, this strengthening also can be achieved by eliminating our weaknesses.

Eliminating Weaknesses – A recommendation that occurs often in the collection of suggestions is the need to regularly assemble faculty of differing disciplines but with similar interests. It is clear that a keen interest in collaboration is shared among a significant number of faculty members given the turnout for the first summit, but the best means to do so remains unspecified. Some have suggested regular events such as a TGIF meeting focused on a particular target or newly emerging research funding opportunity. Others suggest forming a faculty club or meeting facility dedicated to scholarly discussions and multidisciplinary debates. Another suggestion is to repurpose KUCR or create a new organization specifically charged with the responsibility of promoting collaborations on sustainability and energy systems issues. In any case, the fact that such an infrastructure does not exist is a major weakness that needs to be corrected.

Two related issues considered as weaknesses are promotion and tenure concerns and the inequity in course loads across departments and schools. Closely linked are issues concerning cross department appointments that also can be shared with research centers. Historically, promotions and academic tenure issues have depended heavily upon single or lead author publications within the faculty member's academic discipline. In some cases, no allowance is made for collaborative research that results in multiple authorship publications. This attitude of maintaining academic purity within departments puts a damper on the willingness of untenured faculty to become involved in multidisciplinary research efforts. Clearly this situation must be changed if multidisciplinary research on sustainability or energy issues is to increase and become the norm at KU.

The issue of sharing faculty across departments and with research centers is also problematic and could limit KU's ability to muster multidisciplinary teams to address sustainability and energy-related research issues. Sharing new faculty across departments is also complicated by the imbalance that exists in course loads or course release and the opportunity of faculty to participate in joint research ventures on an equal footing. KU needs to find a way to come to grips with these issues and other similar constraints that might inhibit our ability to assemble winning multidisciplinary teams of faculty and students.

Another often cited weakness at KU is the lack of familiarity with the needs of industry. It is unfortunate but true that many academics have no experience beyond the walls of their classroom or their labs. This translates into a lack of connection to public policy and real-world practice. We all know of those whose favorite vacation is a "busman's holiday" and the lack of pragmatism with industry limits our ability to know what industry wants or needs. It also limits KU's ability to prepare students for the real world. This concern has nothing to do with not appreciating basic research. Tuning into the needs of industry, however, does open some windows that will allow us to see the potential benefits of fundamental research. In the course of developing a multidisciplinary research program, we need to find individuals who can help with developing research opportunities with industry.

Many identified weaknesses relate to the lack of communication between researchers and research administration. The perception is that the current research administration has a bureaucratic and gatekeeping mentality and lacks the ability to promote and to provide support for research development. This has resulted in complacency about seeking research grants such that less than half of KU's faculty has outside funding. Furthermore, many researchers have limited knowledge about available funding. It is not enough to have a newsletter or to maintain a funding agency database. What is needed is a proactive research administration that acts as a catalyst to organize and get research collaborations going with seed money or bridge money or other incentives to start or continue research. Overhead monies should be used to perpetuate the seed corn and grow new research activities.

Although there is much evidence that KU has strong capabilities in assessing the impacts of global change and developing green solutions to many of our energy problems, concern exists that there are gaps in our ability to understand many of the dimensions of environmental change and the environmental aspects of energy use. Some even regard energy research and climate change research as adversative, which has resulted in different communities of scholarship. Growing KU's overall research program must accommodate differing views but must not segregate the research activities. There has to be room for disagreement in our collegial setting without sacrificing respect for another's point of view.

Seizing Opportunities - A majority of KU's research funding comes from three federal agencies, the National Science Foundation (NSF), the National Institutes of Health (NIH), and the US Department of Education. Smaller amounts come from the Department of Energy, the Department of Transportation, and other government agencies. KU even gets a small percentage (< 5 percent) from private industry. We do not do that well with other federal sources of funding, and our success from private foundations is even more limited. But even in times of budget shrinkage both at the federal and state level, a survey of the proposed budgets for the coming year indicates that sustainability and energy-related research in many agencies is expected to grow at least by a small amount over the previous year and could loom larger as the economy recovers

As noted before, less than half of our faculty even has outside funding and in the rankings of total research funding among AAU universities, KU is close to the bottom of the list in total research funding.

This situation is of great concern to those of us who care about the wellbeing of the university, but at the same time many believe much can be done to correct the problem by focusing our resources on developing new research projects involving sustainability and energy issues. The turnout for the first two summits indicates a commitment on the part of KU faculty to treat this as a serious threat to the reputation of the university and a willingness to take action to address the issue.

To respond to the variety of opportunities, KU must develop a targeted strategy that focuses on those opportunities where we have the greatest chance for success. The same groups of faculty members that will collectively decide to work together on mutual research interests must also decide on which agencies will be the target for proposals. The approach toward developing new research funding must be multi-focused as well as multi-disciplined. This means that while we will continue to respond to open solicitations for grants, we also need to look at other models that have worked in the past to develop new research programs.

One proven approach to grow new research programs involves one or more faculty members volunteering to take temporary positions in Washington-based agencies to learn how the research funding system works. Many universities actively encourage their faculty to accept these short-term appointments (one to two years) and even provide salary augmentation funds to pay for the added living costs in DC as well as travel funds to return home often should the family elect to maintain two households. In the engineering fields, three universities that have done well in this practice are Carnegie Mellon, Georgia Tech, and Cal Tech. Several KU faculty members have taken this path in the past, but this is an opportunity in our overall research development program that needs to be expanded.

Another path toward developing new funding rarely practiced at KU but well used by other universities and national labs, is called the “congressional education approach.” It is illegal for any faculty member or representative of the university outside of a registered lobbyist to ask for federal funding directly, but it is not illegal to inform congressional staff and congress representatives of important research being conducted at KU. Most congressional staffers are hungry for information about research that is relevant to the committees on which our congressional representatives serve. All federal agencies must testify often before congressional committees that approve their budgets, and our Kansas delegation is no different from other states in wanting to highlight important research under way in their state. Also, congressional staffers can open doors in federal agencies for faculty to talk with the right bureaucrats about unsolicited proposals. KU does a poor job in this area. It should be noted that other large universities maintain a permanent office in DC and have bipartisan lobbying firms to look out for their interests.

Other targets of opportunity include teaming with industry to develop new technology using federal funding as a leverage to establish a new business. Kansas is home to several major corporations, and congress may pass legislation that would encourage industry to develop sustainable systems and use alternative energy by providing tax credits. KU needs to explore the potential of partnering with companies like Garmin, BNSF, Kansas City Southern, or Black and Veatch for technology development research as well as take advantage of private foundation funding based in Kansas.

In summary, KU needs to broaden its horizons in looking for research funding to lesser known federal agencies and to smaller endowed foundations beyond the traditional (and more difficult) targets of NSF and NIH, such as the Agency for International Development (AID) in the State Department or the DOE national laboratories that are required by law to work with universities both in education and research.

Minimizing Threats – In the short term, the biggest threat to KU is the potential of being expelled from the Association of American Universities (AAU), a membership distinction that allows KU to be identified as the “only research university in Kansas.” This threat has been recognized by many of the faculty and the university’s administration as the number one threat that requires changing the research culture at KU. If expulsion from the AAU were to happen, it would be a blot on the university’s reputation and would certainly not be good for attracting top quality faculty and students to KU in the future. KU must address the issue.

With regard to sustaining the planet and powering the world as an important research theme, many people at the summit and the planning committee recognized that there is a danger that the general public and some people in state government would not view sustainability and developing alternative energy sources as a major concern that KU should address. There are many “deniers” of climate change in Kansas. There is a different perspective in Washington and elsewhere in the country, however, where KU is not well-known as a sustainability and energy research university. KU needs to correct this false impression by becoming more aggressive in developing its sustainability and energy research image.

Competition from other universities with established reputations in climate and energy/environment research will be significant, which may mean that KU will need to find a unique niche. This could be related to its geography of being central to the Great Plains and being an ecotone between the eastern forest biome and the grasslands. Having the long-term (1947) ecological experiment station north of Lawrence that does have a national reputation may provide an edge on other universities for certain types of sustainability and energy impact research.

Mitigation of outside threats may also be diminished by doing a much better job of publicizing our strengths and our successes. KU does a pretty poor job of getting the word out to the remainder of the world about the accomplishments of our faculty and our students. Hopefully recent changes in our public relations department will begin to change this perspective. “You have a great university but no one in Washington knows you even exist out here on the Great Plains,” was heard from a recent distinguished Washington visitor. KU needs to change this view.

Recommendations for Funding Opportunities in the Short Term and Long Term

Major US government agencies and foundations have established as funding priorities sustainability research, alternative energy, and understanding and improving the environment. The National Science Foundation’s SEES Initiative (Science, Engineering, and Education for Sustainability) is investing millions of dollars in natural and social sciences and engineering in basic and applied approaches to sustainability. Most major foundations (Ford, Rockefeller, Gates, and MacCarthur) have initiatives on climate, energy, sustainability as they relate to planetary and human health.

KU receives a relatively small amount of funding from DOD, in part due to some faculty members being uncomfortable and unfamiliar with various research organizations in the military. Sustainability and energy conservation, however, are still top priorities in many federal agencies such as NSF, DOE, USDOA, the State Department, EPA, DOC, DOI, and if the policy of allowing DOD organizations to receive credit toward other resource needs (e.g., fuel saved \$ = new aircraft) by demonstrating savings in energy use is continued, then there will be research opportunities for those at KU willing to work with the DOD community. The point is that there are a variety of agencies that do fund sustainability and energy related research and we as a university need to diversify our choices of where we seek outside funding. .

In addition, opportunities for the KU Business School exist to help the DOD community make changes in their business models used in contracting with private industry to handle movement of military personnel, supplies, and equipment could result in energy saving and reduce greenhouse gas emissions. The social sciences and the humanities might also consider research opportunities involving the societal adjustments that must occur as soldiers returning from war zones enter the job market and family life after long absences. Perhaps we can do a better job of integrating our former military people into society than was done in previous wars. In addition, now is the time for our historians to secure valuable data and information related to the evolution of the conflict before memories fade and documents are lost. All of which are opportunities for new and additional research funding.

One opportunity area where KU students and faculty excel is in designing and using energy efficient architectural designs in new buildings. Many federal agencies are slated to be constructing new buildings and research facilities in the coming fiscal year that might provide KU students the opportunity to reduce energy use and emissions with better designs.

As part of the preparations for the first summit, an extensive survey was compiled of differing federal agencies and not-for-profit foundations that might provide funding for education and research related to sustainability and energy. Many reviewers of the information contained in the document marveled at the wide variety of potential sponsors particularly in the education and research foundation section. Funding provided by these potential sponsors is set aside for the humanities and the arts as well as the natural sciences. Funding may not be to the level available for the physical, medical, and engineering sciences but faculty members in the arts and humanities should be encouraged to submit proposals to those foundations that typically support their areas of research.

Another issue related to funding opportunities is the issue of not having equivalent resources in some disciplines to prepare proposals compared to the sciences and engineering. Allowances should be made by KU to augment support services for the arts and humanities in preparing proposals. It is important to have balance across all disciplines, but the most important steps KU needs to take in developing new research funding regardless of the theme is to have someone or some group whose full time responsibility is to find targets of opportunity and muster the right combination of our faculty to respond. This is a first step that needs to happen now.

Recommendations for Infrastructure Investments to Make KU More Competitive in Sustainability and Energy Research

In the course of planning the first summit and preparing the SWOT, considerable angst was voiced about the age, condition, and space adequacy of several buildings, particularly Malott Hall. Concerns about infrastructure or the lack of infrastructure were mentioned at least 20 times during the afternoon sessions of the first summit. Unfortunately, there was little specificity provided in the comments about the nature of the problem, but the desire for a meeting place (perhaps not the Commons because of worry about damaging the floor) was also mentioned quite often. One suggestion that should be strongly considered is providing matching funds for equipment proposals as well as staff support for maintaining such facilities. A follow-up survey should be conducted to get specifics regarding the inadequacy of KU's infrastructure and equipment needs.

During the planning committee sessions, some members suggested that a new interdisciplinary building was needed to break down barriers between disciplines and, as a result, foster innovation and

collaboration. Although KU already has the MRB (Multidisciplinary Research Building), it is viewed as narrowly focused on biological and chemical sciences with no teaching in mind when designed. A true cross-disciplinary state-of-arts user facility should encompass the social, engineering, and physical sciences that combine teaching and research in an open-thinking atmosphere. It is strongly suggested that visits be made to other universities such as Harvard, Stanford, Indiana, and Virginia Tech to see their new multidisciplinary buildings to gain ideas before proceeding with any plans for new buildings.

As already noted, several of the afternoon sessions suggested a faculty club was needed that would have an academic purpose to promote and bring about collaborative discussions. The focus of this summit—sustainability and energy—are of critical concern to the nation and local communities. Most major universities have established institutes to bring together faculty and students in classes and research projects focused on these areas or the intersection between them. The University of Kansas should take its place among major research universities and establish an Institute for Sustainable Energy, Environment and Society or a similar center or institute that builds on KU's strengths in these related areas. Included in the activities of such a center should be the means whereby a history professor can engage a physics professor in an academic discussion, leading to an otherwise improbable collaboration.

Finally, two other infrastructure concerns were mentioned, one having to do with the perceived lack of information technology (IT) resources and the other addressing limited libraries resources. Others were complementary of the same resources, so it is difficult to judge the magnitude of the problem if there is one.

Identification of Gaps in Research Expertise

The results from the afternoon sessions and other discussions at the summit did not clearly identify gaps in research expertise with regard to sustainability and energy research. It was mentioned, however, that KU “lacked expertise in energy policy” and only had “clusters of energy research.” It is hard to disagree with these assessments, but identifying the nature of other gaps is difficult without a campus-wide data base on faculty research interests and experience. Such a data base is sorely needed. In terms of global change or climate change research, no single KU faculty member stands out as being nationally or internationally known or at least no individual was mentioned. The KU geography and ecology departments, as well as the KU Environmental Studies Program, however, have outstanding scientists experienced in forecasting potential climate change impacts, particularly for Kansas. KU also has Professor Don Worster who is known worldwide in the field of environmental history. The KU Museum of Natural History is also known worldwide and has some excellent paleolithic scientists reconstructing past environments as indicators of future environments due to climate change. But KU is not known for its climatic modeling expertise such as found at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado. It would be desirable to attract renowned climate scientists to KU as a complement to existing programs.

KU also has a variety of social scientists and environmental scientists studying potential impacts of climate change on economic systems and landscape dynamics. The Kansas Biological Survey has a well-respected terrestrial ecology research program and maintains a valuable historical ecological test site north of Lawrence but has been unable to add new faculty in recent years despite the fact that many of the current scientists are close to retirement. It is recommended that KU take steps to bolster this expertise to compensate for anticipated retirements.

On the alternative power systems side there are known expertise gaps in power electronics and materials research related to vehicle technologies and smart grid distribution systems. This includes the engineering and computer science disciplines as well as the social sciences, particularly economics. The lack of expertise in hybrid electric power systems is so severe that KU has a mechanical engineer leading a graduate student staffed research project evaluating the use of ultra-capacitors as a short-term power boost to allow electric buses to climb hills in Lawrence.

Given that transportation accounts for nearly 30 percent of all greenhouse gases (GHG), it is important that KU attract outstanding new engineering faculty members that can develop multidiscipline research projects in these areas. If electric power production and distribution are treated as just forms of transportation, GHG emissions from fossil fuels in the US amount to nearly 70 percent total annual emissions. Power production, distribution, and consumption (energy efficiency) are other areas where KU lacks research faculty. This also is an opportunity to grow research funding significantly. It is anticipated that over the next five years or so, at least 30 faculty members in engineering may be retiring. However, to meet the requirements expected by the state legislature of increasing the number of engineering graduates by 50 percent in the next decade, at least 30 new faculty members must be hired. This provides a tremendous opportunity to sculpture a multidiscipline program designed to focus on sustainability and energy issues.

Determining Leadership for Grants and Projects in Sustainability and Energy Systems

Determining who should be chosen to lead new multidisciplinary projects in sustainability and new power systems should be carefully considered. It is doubtful that young faculty members have the experience and maturity that comes with years of practice to manage large projects involving many faculty and graduate students of differing disciplines. On the other hand, some senior faculty members lack the inclination to act as mentors to others working collaboratively on a project and are more interested in furthering their professional career, which also benefits the university. In no way does this singular path need to be discouraged.

Experienced individuals must be found who derive satisfaction in seeing other faculty members and graduate students succeed and are willing to sacrifice further professional development in favor of the overall success of a multidisciplinary research project. This requirement does not preclude solitary academic pursuits but recognizes that addressing most of today's sustainability and power production problems will require a diverse mix of expertise led by individuals who can blend the correct mix of disciplines. One hunting ground for these types of project leaders might be the ten multi-purpose national laboratories in which cross disciplinary projects tend to be the norm. Most national laboratories have disciplinary programs that bridge the environmental, biological, social, economic, and in particular the physical, computing, and engineering sciences. All national laboratories are trying to readjust the age distribution of staff to bring in young scientists and engineers. Some of the more experienced senior managers may be looking for second careers in academia.

Potential for Curriculum Development and Scholarship

Considerable concern exists among many faculty members that the current desire for increasing the amount of research funding at KU will be done at the expense of teaching. In other words the emphasis will be predominantly on research, and teaching will take a back seat as KU moves forward. Others have stressed that teaching and research go hand in hand as it should and that research cannot be accomplished without both undergraduate and graduate student participation. As KU moves forward

with growing its research budget in sustainability and power systems research, a balance between teaching and research must be maintained and supported by all concerned.

Perhaps one way to achieve a balance would be to team teach some courses that are developed around multidisciplinary issues related to global change or new power systems. An example might be the EcoHawks (A Sustainable Approach to Automobiles and Energy Infrastructure) being taught in Mechanical Engineering by Chris Depcik, who has expressed the need for electrical and power systems assistance in teaching this design and build graduate class. Right now the design class is being taught in a partially restored old barn on the west campus that KU DCM is hoping to tear down soon. Hopefully, alternative accommodations for this multidiscipline design class can be found as it represents a multidiscipline model for others to follow.

The idea of team teaching was mentioned many times in the breakout sessions during the summit and warrants careful consideration. The fundamental question asked is how to maintain a balance among departments or schools involved and how to give credit and pay for it. The benefits that can be derived from team teaching a course are recognized as significant and fit appropriately with the multidisciplinary theme being emphasized in all the summits as well as the overall KU strategic planning process. KU needs to find a way to make team teaching more common and work through the equity problems. Team teaching works well with design classes where there are stages of development involved as a student moves through the process much like architect designs a building or an aerospace engineer designs and builds an aircraft. Providing this type of curriculum will benefit KU students at all levels and better prepares them for the real world after they graduate, particularly if industry can be integrated into the training process.

Conclusions

Many commented that the first summit was a great success and that we needed to find a way to continue the process. In fact, one of the greatest concerns expressed by faculty and participants in the planning exercise for the summit was how do we continue building relationships that form the beginnings of the multidisciplinary research teams we so desire. It is reasonable to bring interested faculty and staff together to explore ways of collaboration at a summit, but if there is not a forum for continuing the dialogue needed to breathe life into multidisciplinary teams, it will soon fail. A long term commitment and strategic plan in pursuing excellence and achieving leadership in both research and teaching is essential. Motivating faculty through revision of the tenure/promotion/evaluation and providing essential support, such as the two-way information of funding opportunities and KU expertise, recruiting leaders in key research areas, improving research infrastructure, and mechanisms for interdisciplinary communications, are the key towards this goal.

Likewise, there has to be sustainment once the process begins and that most likely will mean startup funding to perform the preparatory research and exploration of options before willing sponsors are found. We believe that creating this forum with sufficient startup funding is our most important next step.

Some have suggested the creation of an energy and sustainability center similar to centers already in existence at other universities. Others have suggested beginning with a more informal and relaxed

setting of bringing interested faculty together to begin the dialogue necessary to form bonds based on mutual interests. One of the side benefits derived from the summit planning committees has been the development of acquaintances among faculty of differing disciplines brought together for a common purpose. A similar process is needed to begin forming multidisciplinary teams.

As noted before, the fact that KU ranks close to bottom in many of the metrics used by the AAU is of great concern to anyone who cares about the prestige of our university and the desire for excellence in our students. The one metric we can do something about improving quickly is our total research funding. It will take the concerted effort of many faculty and administrators to improve our levels of research funding, but it is certainly within our capabilities to do so. If we take steps to develop additional research funding, it is logical that we will also begin to improve our standing in other measurement categories such as refereed citations and academic awards. At this point the system becomes self-feeding and should lead to attracting outstanding faculty and students to continue the process of improving the esteem of KU.

Finally, a considerable amount of information was collected before and during the summit and most is included in the appendix. Scanning these bits and pieces of thoughts captured cryptically on the flip charts provides only a glimpse into the thought or point someone was trying to make in the short time provided, but there appears to a few jewels in the mix that should be mentioned. Some like “streamline red tape,” speak for themselves, but others leave a mystery such as “Seek blue ocean” = good; “red ocean” = bad, leaves people wondering to what does the analogy apply. If you are reading this document, it is suggested that you also might want to scan the jumbled notes at the end of the appendix. Some of the short phrases and statement may have more meaning to you than others.

Appendix

Summit Agenda

8:30 a.m.

Coffee and pastries

9-9:30 a.m.

Welcome and introduction

Jeff Vitter, Provost and Executive Vice Chancellor

Judy Wu, Joane Nagel, Bob Honea — Summit co-chairs

9:30-9:45 a.m.

Questions

9:45 – 10:15 a.m.

Faculty presentations

- **Don Worster**, Joyce and Elizabeth Hall Distinguished Professor of U.S. History, History
- **Joy Ward**, Associate Professor, Ecology and Evolutionary Biology
- **Town Peterson**, University Distinguished Professor, Biodiversity Institute & Ecology and Evolutionary Biology

10:15 – 10:30 a.m.

Break

10:30 – 11:45 a.m.

Faculty presentations

- **Stacey Swearingen White**, Associate Professor, Urban Planning
- **Susan Williams**, Associate Professor, Chemical and Petroleum Engineering
- **George Bittlingmayer**, Wagon Distinguished Professor of Finance, Business
- **Bala Subramaniam**, Dan F. Servey Distinguished Professor of Chemical and Petroleum Engineering and Director, Center for Environmentally Beneficial Catalysis
- **Judy Wu**, University Distinguished Professor, Physics and Astronomy

11:45 a.m.-1 p.m.

Lunch and Deans' Panel Discussion

Danny Anderson, Liberal Arts and Sciences

Stuart Bell, Engineering

Neeli Bendapudi, Business

Ann Brill, Journalism

John Gaunt, Architecture, Design and Planning

1 p.m.

Introduction to afternoon sessions

1:15-2:15 p.m.

Small Group Discussions on Key Issues

Table 1:

Strengths, Weaknesses, Opportunities and Threats to Improving KU's Standing among Research Universities as They Relate to Sustaining the Planet, Powering the World

Table 2:

Supporting Future KU Research Projects and Leaders in Sustaining the Planet, Powering the World

Table 3:

Critically Needed Organizational, Infrastructure, and Human Investments at KU in Sustaining the Planet, Powering the World Research

2:15-2:30 p.m.

Break

2:30-3:15 p.m.

Group Reports

3:15-4 p.m.

Summary and adjournment

4-5 p.m.

Reception, Natural History Museum

Materials used in preparing the report

Colors relate to topics discussed by planning committee and the summit:

- **COLLABORATION**
- **INFRASTRUCTURE**
- **TEACHING**
- **SUSTAINABILITY/ ALTERNATIVE ENERGY**
- **ADMINISTRATION ISSUES**
- **NOT CLASSIFIED**

Revised SWOT

Strengths

- Strong paleo-climate research programs in geo, bio, & social sciences
- Strong niche modeling research program in bio and geosciences with social science potential
- Strong clusters of energy research
- Strong leadership in sustainability research
- Strong climate change modeling capacity
- CRESIS
- CEBC
- KU TRI Feedstock to Tailpipe Initiative
- Biodiversity data in Natural History Museum
- IGERT Program
- Strong water resources research, assessment, & conservation
- Proven research centers in solar, transportation, bio-refining, petroleum, KBS, KGS, climate change
- Good but limited infrastructure (MRB, NIST Building, Library)
- Strong sustaining life of existing infrastructure research program
- Good infrastructure in some key areas
- Commitment from KU leadership
- Strong research expertise in conventional and unconventional hydrocarbons
- Strong health-related research programs
- Dynamic faculty in some key areas
- Commitment to economic growth in State
- Commitment to economic growth
- Lifespan Institute
- Long history of collaborative & interdisciplinary research

Additional Strengths

- Museum/libraries
- International reach at KU – strong international programs, research, focus, and environmental studies (explicitly mentioned in external review)

- Community outreach
- Students
- Dedicated staff – strength
- Highlighting things we are already doing well – strength
- Regionally specific opportunities and challenges relating to the institutions itself. Other things about location regarding a mature energy industry – tertiary oil recovery programs
- Research centers and institutes

Weaknesses

- Lack space for interdisciplinary collaboration in energy & sustainability research & teaching
- Lack of inter-institutional collaboration
- Lack of communication between researchers, endowment, etc.
- Lack seed/bridge money or incentives to start or continue research
- Lack communication between researchers and research administration
- Poor support for leading interdisciplinary proposals & project management
- Limited understanding of environmental aspects of energy and dimensions of environmental change
- Issues of energy and climate change regarded as antithetical leading to different communities of scholarship
- Few people who do energy policy
- Isolated nationally with regard to sustainability/energy theme
- Complacency about research funding—evidence: about to lose AAU membership
- No clear policies on course release for funded research
- Lack of connection to public policy and real-world practice
- Lack of pragmatism with industry – don't know what industry wants & can't meet industry's needs
- Lack staff for development of research opportunities with agencies/industry
- Researchers limited knowledge regarding available funding
- Not all Depts. value research the same
- No institutional framework for coordinating interdisciplinary hires
- Differing teaching loads makes collaboration difficult
- Physical infrastructure
- Research computing support (modeling, large databases, etc.)
- Ineffective research overhead distribution and reinvestment
- Research admin lacks ability to support research infrastructure; has bureaucratic and gatekeeping culture

Additional weaknesses

- Lack of cross cultural platforms for communication collaboration and research – start something right away like an additional TGIF where faculty can talk on the current topics going forward or people uninvolved can bring new topics – need a space to talk across disciplines

- Not telling story more often
- Lack of involving students despite their capabilities and interests
- Poor track record of bringing in establish faculty
- Lack of job security
- People do not own enough of their time to be agile enough to respond to opportunities that come up
- Start research at an undergraduate level to get folks started earlier on and increase support for students to write their own proposals
- P&T issues – certain kinds of research and achievement may not have the same recognition and they should be seen at the same level of rigorousness
- Service load – some faculty have much greater teaching load than others
- Research dollars
- Post-doctoral programs – more programs and robust programs
- Comparative isolation and lack of realism
- Infrastructure
- Lack of a uniform structure of support – not all units have the same opportunities for publicity even if they all have strong research records
- Aging infrastructure

Opportunities

- NSF, NIH, DOE-Energy Res., & NIST received budget increases; NIH slight increase to \$32 B
- Proposed \$556 B reauthorization (DOT) transportation bill spread over 6 years
- NSF increase to \$7.8 B, includes \$998 M for sustainability research & clean energy economy, \$225M research facilities construction, & \$576 M nanotechnology and biotechnology energy research
- New Chancellor and Provost can allocate resources & leadership support to motivate energy & environment collaborations (this is an opportunity even though it's internal)
- Changes in research and experimentation tax credit may make industry potential funding source
- DOE Office of Science \$5.4 B for long-term R&D; \$550 M for ARPA-E; Energy Efficiency & Renewable Energy (\$3.2 B) increased by 44.4 %
- DOE to invest \$588 M in developing advanced vehicles & \$200 M in electric vehicle infrastructure
- Three new DOE Energy Innovation Hubs proposed
- DOE "Race to Green" grants provided to reduce energy use at universities & hospitals
- USDA to invest \$6.5 billion in renewable & clean energy w/ grants \$350 K to \$500 K for regional biofuels production
- Dept. of Commerce budget increased to monitor weather & climate to improve forecasting severe weather events. DOC/NIST/NOAA - \$4.5 B
- DOD to receive \$76.7 B for RDT&E including basic and applied research and for cleaner & more efficient energy use.
- Despite budget decrease EPA to implement Sustainable (green) Water Infrastructure Policy
- Forest Service & Fish and Wildlife to provide \$1.4 B for forest restoration and wetlands protection

- USDA socioeconomic grants (\$350 K) to assess impacts of biofuels on rural communities
- USDA grants of \$500 K to assess direct & indirect implications of land use change from biofuels feedstock
- HUD to receive \$48 B; includes \$150 M to promote sustainable development, reduce greenhouse gas emissions, & increase transit accessible housing.
- Federal government interest in the issue of climate change – education (including K-12) and research in energy and sustainability
- Kansas is a biomass producing state with good wind resources, and geology for oil, gas and CO2 sequestration
- State Dept. & USAID (\$47 B) promote sustainability & mitigate climate change impacts
- Shortage of qualified scientist supply demands of the environmental, geosciences, and engineering sectors, and many others.
- Increasing interest of the oil & gas industry in supporting research including environmental and alternative fuels research

Additional opportunities

- Partner with Lawrence as a community (i.e. recycling)
- Do a better job of identifying donor worthy projects – make better use of donor interests
- Bridge more centers together between themselves and develop more strengths in the centers to address weaknesses
- Make better use of the expertise we already have – enhance the information we already have available and involve others
- Lead by example in KS
- Education and communication could be emphasized better (for example, with industry)
- Educate the public on relative merits of basic research vs. merits of applied research – they are NOT the same
- Arts and humanities could be more engaged in supporting external sources of funds by helping to attract funding – do more to engage in all aspects, help us showcase what we do

Threats

- KU is in danger of being expelled from the AAU
- KU is not well-known in Washington as a research university
- Lack of respect for higher education and sciences state-wide
- Other institutions conduct more open rank faculty searches which attracts established scholars—we tend to hire Assistant Professor level
- In-state competition and head hunting of faculty talent
- Fragmentation of research strengths
- KU is behind most universities in having a center for research and teaching on global sustainability, climate and energy or energy and environment. Those centers are where the funding will go, not KU

- Our best and brightest faculty & students in energy and environment are being attracted elsewhere because we don't have any synergy or investment in energy/environment collaborations
- Other institutions attract the best faculty and students interested in interdisciplinary energy & environment
- Universities that have already made large investments in campus sustainability (e.g. recent announcement at U of Michigan) likely have a competitive edge over KU when seeking sustainability related external funding

Additional threats

- Political sustainability and the divisiveness it can present
- Political back lash
- Faculty time – lack thereof
- Insufficient respect for different perspectives and narratives on energy and sustainability
- Weakness of physical structures and work space
- More research is going to have to be justified in current political climate

- Supporting Future KU Research projects and leaders in sustaining the planet, powering the world
 - Should be inter-center collaborations that we can assist with forming teams
 - How we can reign the whole campus in to support ideas – we need to pay close attention to what is out there already and not seek to duplicate, we need to find our own niche – don't do what someone else already does well
 - Reorganize KUCR to be more supportive of collaborations and fostering collaborations
 - Newsletters that connect you with others but right now do not – missed opportunity
 - Offering more across department degrees
 - Need a process for connecting the centers to help leverage interdisciplinary aspects
 - Team teaching new courses between departments – true team teaching
 - Need more time, support staff, grant writers, etc.
 - Provide more funding for core initiatives
 - Provide new incentives
 - Need entrepreneurial ways of looking at funding sources
 - Faculty can't keep their finger on the pulse all of the time, need help with that
 - Look at what others are doing, but also do new things – don't always follow
 - Look to corporations for funding and foundations for funding; form and sustain relationships with them.
 - Invest in early and mid-career faculty
 - Invest in graduate and post-docs
 - Streamlining some of the red tape involved in getting a center started
 - Pick directions that we have strength in and pick leaders in those areas and get ahead of the curve
 - Highlight what we are doing well – these are the things that we do well:
 - Centers and those models of leadership
 - Leadership has had the chance to identify grand challenges
 - Had the chance to brand projects
 - Strong network for reaching out through outreach
 - Resource centers for developing new ideas
 - Great ability to recruit new students and inspire them
 - What can we learn from
 - Many initiatives came about because someone actually took the lead and made it happen
 - Funding used appropriately and funding sought and received
 - Institutional support for research projects
 - Being open to new ideas and open to new people

- Recommend to foster and encourage...
 - Interdisciplinary is not taken into account in promotion and tenure – we must make sure people are rewarded for their achievements in the process
 - Providing good communication so that people are aware of opportunities in existing centers and create new centers
- Identifying and obtaining future funding sources
 - Memorandum of Understanding makes it easier to get funding
 - More champions in Washington DC in terms of influencing and making the right contacts
 - Industry funding – we must free up KU’s policy on protecting ideas so that we can engage with industry more easily
 - Foreign language training for faculty and researchers would help to make more globally competitive
- Critically needed org, infrastructure, and human investments at KU in sustaining the planet, powering the world
 - Need more informal opportunities for networking that are supported through some higher administrative structure
 - Can we form an organization that does provide a big tent? Both in terms of space and knowledge.
 - To develop stronger research active faculty across the entire university – responding to a sense of unevenness, some centers really strong and then some departments are not as strong
 - Develop a culture of enablement – try to do more to stimulate opportunities and assist faculty in feeling like they can move forward in some of the initiatives and know best how to move forward with them
 - More responsive to opportunities and look at specific proposals and initiatives and find out better ways to respond to them – examine missed opportunities and what resulted in the missed opportunity
 - Implementation of more interdisciplinary PhDs

Strategic Initiative Summit Notes from Notecards

- **Questions**
 - Will there be an opportunity for participants to contribute to the report of the proceedings?
 - Given the increasing emphasis NSF is investing in third level education and decreasing emphasis in K-12, how will KU sustain its involvement with K-12 outreach and K-12 teacher training?

- Not clear within a department how to “deal” with interdepartmental teaching (who gets “credit”; does one only get 1/3 credit if one teaches collaborative course with 2 other colleagues in another department?)
- **Creation of a Program/Space**
 - One group suggestion is to develop a faculty leadership seminar/workshop/training for how to develop and support a research center. Something like the Self Program for faculty. This can help develop and strengthen high level leadership in research. It would also allow faculty from across disciplines to really get to know each other and share ideas.
 - Need a faculty club to foster socialization across departments and schools connected to a “what’s happening at KU” seminar.
 - Need a place like “The Commons” but it is easy to reserve and it is okay to get the room dirty or move the tables around (ok to scratch the floor).
 - We need a matchmaking environment/sustainability institute to help researchers and existing centers build on success.
 - Implement a Sustainable Development Center at the Edwards Campus with transportation and environmental sciences.
 - Centers to foster collaboration modeled after CTE. Perhaps one for every initiative. Create a Self Program leadership seminar series (or workshops).
- **More Opportunities For Interaction**
 - Communication among centers and among faculty members. TGIF, 2 hours/month, is the only meager opportunity for casual contact and development of interdepartmental conversations.
 - Designate a second TGIF each month for conversations on research collaboration.
- **Kansas**
 - Natural/agricultural interface needs to be focused on and within Kansas and around the world (i.e. can’t focus on wind/biofuel/etc. without also considering influence on remaining natural landscape – wind farms and Flint Hills conservation create tensions).
 - One fledgling program worth mentioning in this answer is a collaborative effort between the Kansas Geological Survey and the Department of Geology to investigate the Ogallala Aquifer in the High Plains of western Kansas. This effort leverages on new technologies and faculty/staff put forward the first effort ever to recover samples of high quality substantive sediments and groundwater at high spatial resolution. A very promising initiative.

- **Campus Sustainability Plan**

- Implement the sustainable campus plan (and leverage its advantages).
- Use campus sustainability plan as a resource – lots of faculty, staff, and students have already addressed research and teaching options.

- **Miscellaneous**

- We need a more proactive KUCR. People who have as primary functions to keep abreast of NSF, USDA, and other agencies and agendas. Proactively contact and counsel faculty, not just proposal prep.
- Create an “innovation incubator” based on the business incubator model to provide seed funds for new high-risk high-reward collaborations.
- There must be a top-down guidance from schools to units that emphasizes the value of collaboration and the products of collaborations. If a unit uses h-index alone, collaboration across disciplines is a disincentive. They take more effort with a lower likelihood of producing products a unit might recognize as valuable.
- Need interdisciplinary PhD programs.
- I would like to see short, intense foreign language training for faculty doing international research.
- Foster an entrepreneurial culture.
- Designate faculty members to serve as funding/grant proposal writers as resources. Have graduate student (RAs?) positions to help other graduate students succeed in proposals.
- Dollar for dollar, having more people in the beltway to help identify opportunities is our best investment.
- Develop a way of instilling a culture of sustainability in students... every student!
 - Required freshman class?
 - Partnerships with Greens to not use plastic cups?
 - Other ideas that speak to and shape students’ daily activities?

SPWW

What have we learned?

- Leverage external funding & seed funding
 - Diversify funding base
- Investing in early-mid career faculty, grad. students—post docs
- Get into funding loop—Washington DC
 - Identify future – get in early (not “catchup”)
 - Joint appointments and incentives for it

Recommendations

- Streamline “Redtape”
 - Decide on our actions
 - Process of connecting research centers (Interdisciplinary)
 - Team teach between depts.—ID courses
 - More cross dept. degrees
 - Industry funding more accessible external partners
-

Strengths

- Existing collaborations
- “brand”

Weaknesses

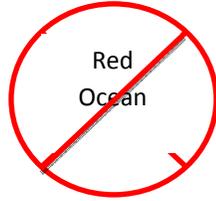
- Unevenness in res.
 - Opportunity—room for improve.
 - Threat—state perception, .UG
-

Single most important Strength/Weakness:

1. Regionally specific opportunities/challenges
 2. Faculty teaching overloads
-

Single most important recommendation:

Seek the blue ocean



Single most important change:

Provide a big tent

(Physically & Organizationally)

Org Changes

- Admin hurdles to bring interdisc courses/wkshps
 - Eg. Grad studs – internships
 - Physical dev needs to be brought into PLNG process
 - Schools must communicate down to unit lvl how valuable interdisciplinary research
 - Don't do interdisciplinary research until tenured
-

II. Infrastructure

- Framework for collaboration
 - Place/Forum
 - Camaraderie opportunities/collaboration
 - Increase # faculty coming into depts. For lectures
 - Better transportation to W. Campus
 - Grants – Expensive to bring in GRAs
 - Physical dev master plan lined up w/ strategic initiatives—academic vision
-

III. Faculty/Staff

KUCR

- More proactive in finding grant opportunities...especially interdis grants
- Mechanism to find interdisc rsch opps
- Often RFPs never go "live" —proximity to D.C. rules

Train faculty on how to manage research project—especially interdisciplinary research. Improve training for PMs.

Single most important

- Communicate w/in depts./schools
 - Relax intellect property
-

Table 1

Internal Strengths Q1

- Interdisciplinary Research Ctrs
 - Ind. – International Area Ctrs
 - Others
-

Table 1

Q1

How...

-more structures

-Incentives

More of:

-Professional Recognition

-Institutional Rewards

Q2

Internal Weaknesses

- Un-engaged fac.
 - Teach/research/balance
 - Insufficient research infrastructure
 - Databases_____
 - Budget cuts
-

Q3

External Opportunities

- Industry opportunities
- Edwards Campus (JoCo)

Q4 External Threats

(2)

-Persistence in face of adversity/commitment

-How best to collaborate—what works well

“Persistent Collaboration”

-Opportunity to incubate—help good ideas get a good start

-Provide seed funding...

- Mentorship, seeding

*Institute/forum to come together

(3)

Fac./Staff 's (changes?)

-Staff to shape & assist w/ marketing strategy

-Integrate support specialties

-Research ‘match-makers’ – establish)

Or channels

-Matching student interests with needs & existing programs

-Engage/Embedded librarians, artists, journalists in research teams

Connective tissue:

-Forum for engaging in discussion, research sharing, seminars

-Central resource(s) for communication

- Make it attractive to participate/workload
- Resources to share information re research/sustainability
- Social Network Forum
- LEED building standards for campus (with metrics)
- Institute/umbrella for sustainability
- Institutional support for collaboration & connectivity including in tenure & promotion

(1) -Museum & library resources

- Community outreach
- Student passion & involvement in initiatives
- Dedicated Staff
- *Existing Programs (doing)
- Tell more stories/KS→ (expand)
- lack of job security for research & academic staff (supported by soft money)
- *lack of realism/Real world concerns
- Partnership with Community for recycling (dual trash,i.e.)
- Lead by example
- political divisions of sustainability
- potential backlash-sensitivity required

Single most important strength, weakness, opportunity, threat not listed:

International outreach

Linkages, research, focus, strength in Env. Studies

Weakness: Lack of a uniform structure of support (publicity, service load, support staff, \$\$\$)

Opportunity: [Education and Communication]:

-Better communication w/ industry

-Educate the public on relative merits of basic and applied research

Threat: Insufficient

Respect for different kinds of narratives and different perspectives on energy exploration, sustainability, growth, and limits

(What is realism?)

3. Support for interdisciplinary opportunities in teaching and research. (Must improve reward structure, especially for junior faculty.)

Support for aligning initiatives with new gen-ed

2e

-Interdisciplinary. Degrees (especially In Transp. Planning)

-Growing/ fostering/Recruiting leaders

Training 

-Scientific and Leadership skills

-Industry contact → societal linkages → as an additional funding basket

-Linkage (fostering) between Societal Needs & core research

-Leadership Incentives & models

#3 Interdisciplinary... Degree Structure

-Reward structure for working across Boundaries

-Quality/Modern Space (Updated/New Buildings)

-Postdoc training

1 -Internal Strength

-Research units & centers form natural linkage between basic & applied fields/problems

-Threats

-Increasingly reduced/scarce resources

-Opportunity

-Using existing centers capacity to build linkages to basic sciences to leverage funds

-Internal Weaknesses

-Infrastructure/student support

Table 3 Questions

Organizational changes

-mechanism for faculty to cross depts..

-opportunities for exchanging info

-language for interacting

-upgrade Center for Sustainability to coordinate these opportunities (see Curriculum & Research section of *Building Sustainability Traditions*, the Campus Sustainability Plan, at <http://www.sustainability.ku.edu/Plan/>)

-wide-public disc.

-space needs for research

-plan ahead for space needs

-equipment/hardware

-inventory of equipment/hardware

-develop concept of campus as living lab

-partnerships with community

-business processes to support collaboration?

-indirect costs?

-how to get people to work together

-knowledge management

-management field for an answer

-how to use indirect costs?

Internal Strengths

- have right size and diversity in departments to be effective
 - people are passionate about KU
 - willingness to collaborate
-

Weaknesses

- knowledge about other programs
 - space/facilities
 - siloed
 - limitations of business processes – restrict ability to carry out work between departments
 - need Keeler professorship for research
 - insufficient dept. funding
 - link basic research to real world
 - looking for right problem
 - established linkages already in place elsewhere
-

Threat

- inconsistency in external funding
 - linking technologies
 - we need to take chances
 - intellectual property returns
-

2-1 Models:

1. Open/regular meeting with outreach posters/presentations
 2. Mixture of fundamental and applied
 3. Leadership w/ stability/skills to ID “grand challenge” & involve many interests
 4. Ability to “brand” the projects
 5. Respect disciplinary contributions
 6. Network to facilitate outreach (internal/external)
 7. Resource center for developing new ideas
 8. Ability to inspire and recruit students (undergrad & graduate)
-

2-2 Foster & Encourage new leaders

1. Provide time
 - a. Release from teaching
 - b. Keeler Fellowships or equivalent
 - c. Connect teaching to research interests
 2. Thoughtful design of courses by team
 3. Provide support staff
 4. Awards/recognition with money
 5. More distinguished professors
 6. Mentor new professors
 7. Hire leaders from outside
-

2-3 Funding Sources

1. Knowledge of funding sources in industry and government
2. Knowledge of needs of industry and other funding sources
3. Partner with industry
4. Encourage internships
5. Build foundations to provide seed money
6. Provide more matching funds
7. Hire professional grant writers

Most Important:

Hire (retain) demonstrated, agile, capable leaders

3-2

1. World class buildings to bring together key players & their students

3-3

1. Broad participation of faculty
2. Tech training for staff
3. Hire staff at a higher skill level & pay
4. Allow more flexibility w/ time allocation for faculty

3-1

1. More joint hires that span depts./centers
2. Team taught across depts.

Most Important:

New interdisciplinary building that breaks down barriers & fosters innovation

1-1

1. Existing key players, people, programs to build one

1-2

1. Crumbling infrastructure

Most Important:

Cement existing programs

Problem-driven Collaboration

Communication Opportunities

Make use of existing

How to enhance/create new ones

Strength: Tech transfer/better use of expertise

Barriers: Risk aversion

Weakness of physical structures

Quality of workspace

Infrastructure, space, IT

Opportunities to improve standings

Industry as a source of funding

Identify donor worthy projects

NSF new creative program

Multi-institutional initiatives

Biggest threat: faculty time, project space time

Opportunity: some groups already work fine

Hire big for success – 2 prong

Best & brightest

Hire for up and coming

Hire at mid & upper level

Table 2

Research center infrastructure

Breeding ground for cross disciplinary ideas

Critical mass of expertise

Seed money

Cluster hires

Joint faculty appointments

Centers/academic unit

Most Important Recommendation for Leadership: Mentoring & Incentives

Organizationally:

Institutional responsiveness to opportunities

Specific proposals/initiatives

Interdisciplinary Ph.D. degrees

Examine recently missed opportunities

Culture of Enablement

Q2 Identify/Support Leaders

- Seed money for “small steps” towards larger collaboration
- “Center” support: (‘The Bala Factor’)—CEDC CRMDA (Todd Little)
 - Merit system for integrative stand outs
 - e.g. summer salary
 - “leadership training” for different roles besides chairs
 - self leadership for faculty
 - seminars widely disseminated

Q3 Organizational Infrastructure

- I. Org
 - a. Community enhancement—Lines of communication to help identify expertise
 - Information of people
 - Face to face
 - Website
 - Faculty club
 - Clearinghouse of info research interests
 - Resources in existence—equipment space/share ability w/ supporting staff—scientific computing, too
 - Communication Skyping
 - Formal venue of introduction
 - University-wide seminar series
 - Rope in KUCR
 - Sigma Xi
 - Ongoing planning—university wide poster sessions
- II. Infrastructure
 - a. Utilize existing structures (e.g. KUCR)
 - Need post award services
 - Institutional support for large multidisciplinary grants esp. unaffiliated w/ centers
 - Broadening mandate of centers
 - Bolster institutional affiliations of ‘soft \$’ folks (“prof” sounds nice)
 - b. University support to connect individuals to money
 - c. Revamp relationships w/ industrial contacts

- d. Student (Ph.D.) recruitment
 - Student language barriers (toefl)
 - AEC not helpful
 - e. Open access for publications AND data
 - f. Up grad support w/in industry
-

W: Hiring Strategies

- Hiring named professorships (distinguished)—super important & cost effective!
- Warped calculus involving start up funds & reputation of recruitment

Idea: named professorship to continue through donors

W: Grad Recruitment, especially Ph.D.

Q1 Strength/Weaknesses

“Lingo Programs” → “expertise”

W: Underestimate student interest

S: Pockets of brilliance

W: Don't cross fertilize

W → Lack of administrative support throughout (in list below)

S: Reputation of university (international reputation)

W: Don't forget chemistry

W: Not enough stars

S: Not too many stars

S: Best connections in China ever!

W: University doesn't exploit this fully

Q1 Saving World

S: Location (sun, wind, food, H2O)

S: Local commitment from lots of people

W: Resources lacking for investment in people

- Money
- Personnel
- Space

Model Threats:

W: Topeka/Phelps

W: Legislature/School Board

Opportunity: High powered hiring opportunities

Funding?

- Hire/contract experts to find common grounds
- Use/develop resources to tap donors/foundations for resources
- Capital Campaign?

Lessons?

1. Hero, entrepreneur
2. Administrative support
3. Name and mission support i & t partners=money success

Recommendations

1. Support time & resources
 2. Site/city to stimulate collaborations & interdisciplinary agents of change
-

GRAND unique idea & cultivate hero with idea & RETAIN THEM

Organizational Changes

RGS needs reform

- Research
- Graduate Studies

Both stumbling blocks

IT → Behind time

- Heterogeneous need campus wide improvements

Improve facilities

- Facilities
- Buildings
- Libraries

Faculty: Retain excellent faculty even when inconvenient

Weakness

- Grumblings & low morale on some units members feeling left out
- Uneven teaching loads leading to lack of time
- Buyout teaching mechanism

Threats

- Administrative inability and lack of continuity
- Lack of “aggressiveness” to hire at mid-career level

Opportunities

- Engagement of arts, media on projects to be agents
 - Internal
 - Opportunity
 - Gen Ed revisions

Existing Models

- Overhead \$ → seed grants
- One size doesn't fit all
- Industry support
- Federal research, state

- IT support, grand dev.
- Core competence
- Time to gather support
- Getting F&A back
- Support for Jr. faculty
- 4% not enough
- Long time to get collaboration
 - Support, bring points of view together
 - Right kind of time & person
 - Commit to interdisciplinary
- Strong admin. Abilities, bring people together
- Full time people to write proposals
- Need to grow Jr. faculty to be PI's-mentoring
- Staff
- Good grant manage writers
- Seed grants
- Team building grants (not teaching)
- Few key people create a "hub"
- Send some of that back
- Sometimes centers can be silos
- Core group-established & Jr. faculty
- Models/data/examples of successful grant proposals
- Seed grants to get data to show granting agencies to bring in outside reviewers
- Meeting a need and sources of funding out there
- Teaching/service load vs. proposal writing > but no time off to write a proposal & then time to manage it
- "Know how" to write grants
- "Selling" a proposal

Leadership

- What's in it for me?
 - Sometimes there's a learning curve
- KU up front commitment & ok if doesn't pay off until years down the road (don't put in level of monies to get long term success)
- We're going up against established centers

Future funding

- Corporation connections
 - "Who you know," relationships are key
 - Alumni advisory boards and one on one interactions

- External advisory boards
- Lots of options, one size doesn't fit all
- Little monies can mean a lot
- State/Federal funding (change quickly & going down)
 - Maybe emphasis corporations
- I.P. issues-takes time (need to be quick)
- Right place/right time

Table 2 Single Most Important

- inter-center collaborations
- Pull all together
 - Re-organize KUCR to do all of the above—on the ground helping

Faculty can't keep "finger on pulse" all the time

University support-time/administrative technicians/seed money to set up centers

Reorganize KUCR to offer a better level of fundamental grant development & administrative support → would encourage reluctant participants worried about administrative burden/greater ability

Excellent support staff in the area of grant development & management

Commit KU resources (positions, money, support staff, etc.) to the most promising initiatives

Willingness of chairs, directors, & upper university admin to foster & maintain relationships w/ synergistic corporation & foundations

Look what others are doing. Understand what & how the leadership will serve. Good vehicle ongoing open forum & input-what happens next

Provide core funding (enough for new initiatives) avoid underfunded programs

Do not support new initiatives that lack a core of committed faculty

Remove academic barriers to collaboration

Recognize & mitigate barriers to applications-especially organizational structure for major collaborations

Leverage alumni network & exchange of innovation & ideas as new funding opportunities, across public-private networks. (Recognize latent potential/interest of the world outside academia.)

The newsletter alerts you but doesn't connect you w/ others (introductions)

Table 3 Single Most Important Change

- Leap out to something new
- Reorganize KUCR-to be agile (not necessarily more money)
- Research & teaching & service merges together into one
- In key areas
 - Hire senior faculty-research, and hire (Jr. faculty to teach & do research & learn from Sr. faculty) someone to teach too (use NSERC chairs program as a guide)
 - Use skills efficiently
 - Need mentorship-mid-level senior people → to help Jr. faculty
 - Undergrads doing research
 - Support

Offer relief for time burden of interdisciplinary projects