PROGRESS ON RECOMMENDATIONS OF 9/24/10
CU-BOULDER ENGINEERING ADVISORY COUNCIL MEETING

The key recommendations of the CU-Boulder Engineering Advisory Council (EAC) at its 9/24/10 meeting are provided below in italics, followed by summaries of the progress and plans made to-date on these recommendations. This summary report, prior reports, and other EAC information is posted at http://engineering.colorado.edu/overview/advisory_boards.htm.

General Discussion
1. Update the EAC Bylaws for approval at the next meeting, with expectations for EAC members including philanthropic support of at least $2,500/yr for each member, with flexibility for special circumstances.

The modified bylaws along with an appendix of expectations have been sent to EAC members as a 30-day motion for approval at the 4/29/2011 meeting.

2. Sustainability is an appropriate emphasis for CU-Boulder and should be pursued with faculty buy-in, branding, partnerships, certificates in engineering for developing communities and leadership, and research on renewable energy.

We are making good progress on research in sustainable energy (see summary for the Research Committee) and have begun conversations with RASEI (Renewable and Sustainable Energy Institute) and NREL (National Renewable Energy Laboratory) on joint hiring of faculty. We also have important research in the areas of air quality and water quality. During this summer and fall, we will begin discussions on how we might make a big impact on water use (and reuse) for energy applications. Finally, a graduate certificate in engineering for developing communities and an undergraduate certificate in engineering leadership have been developed and approved.

Education Committee: Recommendations from the Education Committee on 9/24/10 meeting are

1) Introduce the new Introduction to Engineering course in Fall 2011 and use Center for Engineering Education Research and Assessment (CEERA) Teaching Fellows for this and other interdisciplinary courses.
2) Establish an Advisory Board for the Engineering Honors Program along with a development effort, and form CEERA to help support the Honors curriculum.
3) Continue and grow the E-ship Program along with a priority for fundraising.
4) Include leadership expectations in the Honors and E-ship programs.

Update
1. The GEEN 1500 Introduction to Engineering course is scheduled to be piloted with 180 students in Fall 2011, with all engineering majors contributing 5-week discipline modules. Associate Dean Brian Argrow and BOLD Center Director of Teaching and Learning Initiatives, Beverly Louie, will co-teach the pilot course. The course theme is centered on using the 14 NAE Grand Challenge problems to introduce our engineering disciplines, along with content focused on topics such as the transition to from high school to the University,
campus life, and ethics. The plan to deliver the course in Fall 2012 to 800 first-year students has been prepared and will use CEERA Teaching Fellows.

2. An Honors Advisory Board has not yet been formed, as the focus during the past few months has been to successfully obtain campus funding for the Engineering Honors and GoldShirt Residential Academic Program. A college-wide retreat was held 4-5 February for the formal kickoff of CEERA and discussion of the purpose and content of the new GEEN 1500 course. The CEERA vision is: A College that promotes academic excellence through the study of how students learn, the implementation of evidence-based teaching methods, and the production of recognized engineering education scholars, with a mission to:

- Promote a culture of evidence-based engineering education
- Create a community of scholars who provide excellence in engineering education research and who integrate the science of learning into the teaching craft
- Create a nucleation point for doctoral studies in engineering education
- Support engineering disciplinary research
- Be a leader and partner in the CU STEM initiative and the broader national effort to improve engineering education
- Be a broker for teaching services of the BEST teachers in our college

3. E-ship fundraising has resumed, with over $70,000 raised since the prior meeting. The Dean committed an additional $25,000 per year, and expects to be able to increase this amount when campus funding for growth is obtained.

4. A new Engineering Leadership Program has been approved (see Partnership Committee summary) and will interface with the Honors and E-ship programs.

5. After consultations with the Admissions Office, the new enrollment strategy with a target maximum for each major is currently being implemented for the Fall 2011 class. At this reporting time, the strategy appears to be functioning as planned.

The proposal to the campus to establish CEERA is in preparation. This proposal includes a plan to support the Engineering Honors curriculum with CEERA Teaching Fellows. A proposal was submitted to the campus leadership to officially recognize the Engineering Honors Residential Academic Program (RAP) and to fund it at the level of other RAPs sponsored by the College of A&S.

Inclusive Excellence Subcommittee: Recommendations from the meeting on 9/24/11 are

1) Set access goals of 17% underrepresented minorities and 33% women by the Fall 2013 entering class, on the way to a longer-term goal of parity with state demographics.

2) Set performance and retention goals for underrepresented students of at least 90% of those of the majority population by 2013, on the way to a longer-term goal of parity with majority students.

3) Develop a BOLD fundraising campaign, with an initial goal of raising at least $100,000 in new scholarship funds during this fiscal year, above and beyond current scholarship
support. BOLD Advisory Committee members committed to “give or get” an average of $10,000 each this year.

4) Implement **retention** initiatives based on research-informed, mentoring initiatives with industry. Initial events have included round-table discussions with Joanne Maguire and other Lockheed-Martin executives on 9/21/2010 in the Integrated Teaching and Learning Laboratory and an Industry Night in the BOLD Center on 10/6/2010.

**Fundraising** - With the guidance and partnership of the BOLD Advisory Council (BAC) and CU Development, the BOLD team has developed a five-year, strategic **fundraising campaign** to create a new $5M BOLD scholarship endowment – initially providing 130 BOLD scholarships. A long-time BOLD donor has committed $100K for scholarships towards the $5M endowment. And, the BAC established their own scholarship endowment, with $27K in start-up gifts. A Denver-based foundation donated $400K in March 2011 to continue support of our three school district K-12 TEAMS initiative in three school districts. The National Action Council for Minorities in Engineering (NACME) conducted a BOLD site visit in March 2011; while we await the official report, early indications are that NACME views our engineering college as a model for inclusive-excellence initiatives.

**Access and Recruitment** — As a result of a strengthened and more strategic relationship between engineering **recruitment and admissions**, the college has seen a significant increase in women and minority enrollment since the formation of the BOLD Center two years ago.

- So far for fall 2011, and not yet taking GoldShirt student enrollment into consideration, 24.4% of confirmed first-year students are women and 12.7% are minority students, on track toward our 2013 goals of 33% and 17% respectively.
- To exploit the persuasive power of scholarships to the admission decision process, the College and BOLD changed scholarship award processes to be more financially aggressive and timely. As a result, 284 BOLD scholarships have been offered for fall 2011 first-year students — 166 to women, 83 to minority students, 35 to first-gen majority men and 19 to other majority men.
- With enhanced focus on **access** initiatives, participation in our November and January all-day **Girls Explore Engineering Day** and **Diversity Sampler** events quadrupled. And, participation by prospective BOLD students at the **Admitted Students Day** luncheon more than doubled.
- With a focus on **building capacity** through K-12 partnerships, our College is playing a key role in significant growth of Longmont’s Skyline High School STEM Academy, teaching five different 9th – 11th grade engineering design courses to 184 students this year, of which 35% are girls and 29% are minority students. All 1260 6th – 8th graders at Skyline’s two feeder middle schools explore engineering design through their science courses, and engineering is taught by CU graduate TEAMS Fellows to 400 5th graders at six Longmont elementary schools, accompanied by 10 after-school TEAMS clubs.

**Retention and Performance Initiatives** — The emerging challenge of retaining the interest in engineering studies of well-performing women throughout our college looms ever larger.

- In response to growing understanding of the importance of creating community through collaborative math achievement, BOLD was awarded $30K/yr for two years from the
Dean to offer 13 Math Workgroup sections, expanded to include Calculus III and Differential Equations.

- This year, more than 220 students used BOLD’s Student Success Tutoring Center (SSC) over 1050 times, with most seeking help for Calculus I-III, Chemistry and Physics. Through ~40 hours of weekly support by two tutors simultaneously, approximately 2000 tutoring hours were provided by SSC. User feedback, formally sought following each student visit, as well as quantitative grade analysis, shows significant positive impact for SSC users.
- New in spring 2011 and in concert with the BAC’s retention subcommittee, BOLD initiated peer-to-peer and industry mentoring, two industry site visits and three industry nights for the benefit of ALL undergraduate engineering students, creating networking and career insight opportunities.

What do our students say? BOLD conducted three new surveys during spring 2011 to obtain in-depth student feedback: a BOLD Center user survey, a Native American student experience survey, and a college-wide exit survey for students that did not return to engineering this past year. To-date, over 215 students responded to the BOLD survey, the exit survey received 81 responses, and the Native American survey 10. Action plans and initiatives are being developed to respond to student input.

Operations Committee: The operations committee noted very positive progress on campus decisions to complete the Biotechnology Building and provide the College of Engineering and Applied Science with some space in the old Fleming Law Building. Other discussion items and recommendations include

1) Monitor use of Fleming library space, and write letter requesting it for engineering design projects if it appears underutilized.
2) Visitors have observed that some research labs are messy – clean up is needed to project a safe and professional environment.
3) Sustainability initiative should be led by research, perhaps with an addition to the Office of the Associate Dean for Research.
4) Nuclear energy has more economic viability than other alternative energy sources, and CU should consider its role.
5) Clarity should be provided on EAC member expectations, and an expected annual contribution of $2,500 per member, including $1,000 for the Dean’s Club, is recommended.

In response, our monitoring of Fleming has found that its old library space is still unused, for the most part, but engineering departments have also been slow to occupy the rooms that they have been assigned. During summer 2011, we will undertake a college-wide space re-evaluation and re-assignment process, including the Fleming Space. During the same time, we will initiate lab clean-up as part of the process. The sustainability initiative has research on energy as a primary focus, including biofuels, solar, wind, and smartgrid but not nuclear at this point. Clarity on EAC member expectations is included in the proposed amendments to the by-laws.
Partnership Committee: The recommendations from the partnership committee are
1) **CU Venture Fund**
   - Encourage David Allen to get this fund launched as soon as possible
   - Peter Mannetti will talk to Wayne Hutchens and provide a strong endorsement
   - The CU Foundation should itself invest in this fund
2) **Leadership Certificate**
   - Very strong endorsement of the proposed certificate
   - A rich list of topics to be covered in seminars was developed
   - Strong recommendation that graduate students should also be able to obtain a leadership certificate
   - Did not see a need or driver to develop an umbrella for certificates offered through the College
3) **Potential Next Focus Area**
   - The group believes the College should be doing more to develop deep relationships with targeted corporations, and that these relationships should drive significant financial support to the College, with corresponding value to the corporations through access to our students and faculty

Engineering Leadership Program
The Engineering Leadership Program, leading to an Engineering Leadership Certificate, has been approved by the College and the campus and is being launched in Fall 2011. This program will offer opportunities for students to pursue leadership courses and experiences to prepare them to be leaders in their chosen careers, whether in engineering fields or other fields such as government service, law, medicine, etc. To obtain the Engineering Leadership Certificate, each student will demonstrate leadership through academics as well as practical experience in team-based projects. The student will also demonstrate strong written and verbal communication skills through interaction with a mentor and a production of a portfolio of leadership experiences.

EAC continued support will be required to provide mentors for the students in the program and speakers for the leadership seminars. JoAnn Zelasko, Assistant Dean for Administration, will be the Engineering Leadership Program Director, and she will work with the EAC members to match students with mentors and to determine topics and speakers for the leadership seminars.

The specific requirements for the certificate are:
- 9 credit hours (in most cases, 3 courses of 3 credit hours each) in leadership, project management, and/or global perspectives, with a grade of at least B- in each of these courses. The new Engineering Leadership Gateway course is required, and should be taken in the 1st or 2nd semester of the program.
- A significant extracurricular experience in industry, government, or a non-profit organization that includes a team-based project.
- Participation in at least four college-sponsored seminars on leadership.
- Selection of a mentor in the student’s likely career path (e.g., industry, government, education, non-profit) and interacting with the mentor at least once per semester.
- Development of a leadership portfolio.
More information on the Engineering Leadership Program is available at http://engineering.colorado.edu/leadership.

CU Venture Fund
David Allen, Associate VP for the CU Technology Transfer Office, continues to lead the effort to create a CU Co-Investment Fund. A prospectus has been written and shared with the CU Foundation (CUF) leadership and the University Licensing Equity Holdings, Inc. (ULEHI) Board of Directors. The prospectus would create a capitalized investment fund, based on donations raised by CUF, to provide early capital for high potential, investable start-up and early-stage companies emanating from CU research. The primary use of fund capital would be to invest in convertible debt and equity instruments in companies originating from CU research. These companies will have licensed intellectual property from CU in fields such as medical therapeutics, devices and diagnostics, renewable energy, optics, electronics and mechanical devices, chemicals and materials, and software and informatics. The fund would be a participant in the top venture firms’ financings of CU’s equity portfolio, with an objective of completing investment syndications for these deals.

In early February, the CUF leadership expressed the desire for a financial structure such that CUF raises and holds the funds. In this structure, the ULEHI Board would do the initial investment review and make an investment recommendation, and that recommendation would then go to a small group of people at CUF who would decide whether or not to invest. This structure is a significant change from the original proposal, which had ULEHI managing the investment decisions. ULEHI leadership is not in favor on this structure because they may be unable to invest in an opportunity that they believed warranted an investment, or they may be managing an investment that they did not support. A bonded investment-management team of CUF and ULEHI personnel is currently under consideration.

Potential Next Focus Area
Deepening relationships with targeted companies will be discussed by the partnership committee at the 4/29/2011 meeting, along with next steps on the venture fund and leadership program. EAC members have provided tremendous help in building the partnerships with several key companies, and we are working to add a few other companies but with a focus more on depth than breadth.

Research Committee: The following recommendations were made by the research committee
1) Provide research metrics in comparison to peer/aspirant group.
2) Continue research programs in renewable and sustainable energy, and add natural gas to the research portfolio due to its relative abundance and low cost.
3) Describe how STEM education research fits into the college portfolio.
4) Provide support for proposal preparation – literature review, editing, “red teams” to critically review proposals before submission, etc. – as well as post-mortems on failed proposals to improve for subsequent submissions.
5) Continue communication strategy of research highlights.
6) To sustain recent growth in research funding, there should be targeted growth in the College’s portfolio in DoD and DOE.
In response, the following progress and plans have been made:

1. In addition to tracking research metrics within the college and our departments, we will develop, over the summer, a set of accessible metrics that we can track relative to peers and aspirants. A limited set of data (research funding, Ph.D. enrollments) has been included in our strategic-plan assessment. Some additional data will be obtained and presented at the 4/29/2011 EAC meeting.

2. Research programs are growing in renewable and sustainable energy, with new projects initiated in the last year from the Department of Energy (carbon capture, ~$3M; smart grid security, ~1M) and the National Science Foundation (innovative building materials, ~2M), as well as many other projects. We continue to partner with RASEI to develop research impact areas and programs, and are working together on a cluster-hiring strategy. We have not done anything specific to natural gas, although this will be discussed in the faculty hire strategy sessions with RASEI and CEAS.

3. Engineering education research is being undertaken by a few faculty in various departments. A new center, the Center for Engineering Education Research and Assessment, led by Brian Argrow, is under construction. It will provide an umbrella for engineering education research as well as a direct tie to engineering education practice in the College. This is important in terms rapidly making an impact as well as leveraging investments in challenging economic times.

4. The Office of the Associate Dean for Research will provide proposal support for two STC ($5M/yr for 10 year) proposals selected by the campus for submission to NSF, and are doing a post-mortem of recently-declined ERC and IGERT proposals. We do not have resources to provide broad proposal editing support, but this is a desire. We have provided proposal writing workshops and will continue to do so, improving them at each offering.

5. Our communications strategy for research highlights is continuing. A winter communication was released: [http://engineering.colorado.edu/Spotlight/spotlightwinter10.html](http://engineering.colorado.edu/Spotlight/spotlightwinter10.html), and a Spring 2011 communication will be released soon.

6. We are more aggressively connecting with DOD and submitting more proposals. For example, we created a Research Visions seminar series to bring program directors/leaders to campus to give seminars about their organizations and meet with faculty to discuss opportunities. This program has included two DOD speakers (including the DOD Chief Scientist); this month, another DARPA speaker will visit as well as the NASA Chief Technologist. In the last half year, the Associate Dean for Research (ADR), Marty Dunn, has also strategically met with many DOD program officers and communicated information to our faculty and helped them make connections. Agencies include DARPA, ONR, AFOSR, and ARL. He plans to explore connections with ARO more in the future. We post many of his meeting notes on a password-protected website to make them broadly available, and faculty seem to find this valuable. Our faculty have responded (often successfully) to many DOE FOAs, but the ADR office has not done anything at a larger scale to build DOE connections. We will do so in concert with our evolving RASEI collaborations. A challenge with DOE is that it increasingly require cost-sharing of >20%. We are strategizing about creative ways to meet these requirements and as such make ourselves more valuable partners to national labs in responding to these.
Resource Development Committee: Recommendations and updates from the RDC meeting on 9/24/10 include the following:

1) **Recommendation:** The RDC endorsed changing the bylaws to state that EAC members are expected to provide annual financial support of at least $2,500, including $1,000 annually to the Dean’s Fund for Excellence and $1,500 to any other program of our college.
   **Update:** Expectation of participation by EAC board members, and a recommendation to change the bylaws, was drafted and sent to EAC members more than 30 days prior to the board meeting scheduled for 4/29/11, when a vote on the recommendations will be held.

2) **Recommendation:** Send a reminder to all EAC members who have not yet joined the Dean’s Club, asking them to join and providing a convenient online option and hardcopy giving form.
   **Update:** An e-mail with a giving form attached and an online giving option was sent to EAC members in December. The result was $13,000 and 5 members. Doug Smith is signing a hard-copy letter in April to be sent to remaining EAC members who have yet to join. 19 EAC members are in Dean’s Club.

3) **Recommendation:** Planned giving was enthusiastically embraced as a long-term strategy for securing more resources for the College. The recommendation is to keep this giving option of the front of the minds of alumni and EAC members.
   **Update:** The CUF Engineering development staff and college partners continue to discuss planned giving with donors and prospects, with excellent results. As of 4/12/11, we have documented $9.675 million in new planned gifts for the College fiscal-year 2010-11. Numerous additional potential donors have been identified and are in various stages of cultivation and solicitation.

4) **Recommendation:** Several members of the ChBE/Biotech fundraising subcommittee volunteered to help CU/CUF make connections with prospective donors, most of whom are affiliated with corporations.
   **Update:** Progress has been made on both fronts, corporate and individual, with about $4.5 million raised in fiscal-year 2010-11. Members of the committee continued to provide names and connections during the six-month period after the fall meeting. A committee member recently made excellent progress in engaging one of our largest potential donors.

5) **Recommendation:** Incorporate a tour of the Biotech Building during the next EAC meeting and a discussion of giving/fundraising strategies for the Biotech Building with the EAC.
   **Update:** All EAC members are invited to attend a tour of the Biotech Building during the EAC meeting on 4/29/11. The RDC will discuss giving/fundraising strategies for Biotech on 4/28/11.

6) **Recommendation:** Next fall, hold the Dean’s Club event on a home football weekend. Doug is willing to host a brunch on the morning of the game.
   **Update:** CUF staff requested a football suite for several possible home games, and has tentatively been assigned a suite for 10/22/11.

R.H. Davis 4/15/2011