GeoEnergy Initiative

Department of Geological Sciences, University of Colorado Boulder

In 2015, Geological Sciences inaugurated a new research, teaching and hiring initiative in "GeoEnergy". This initiative will marshal new and existing faculty and operational resources towards establishing CU-Boulder and the Department as a leader in innovative, interdisciplinary research in energy issues related to the solid Earth and its interactions with hydrosphere, biosphere and atmosphere. The central goal is to strengthen and coordinate departmental teaching and research activities in geoenergy to support the highest-quality educational experience for a growing number of geological sciences students and enable visionary research across petroleum geology, geothermal energy, alternative energy resources, and economic geology.

The Geoenergy Initiative will support this vision of excellence through the establishment of a 21st century energy center and its interaction with faculty across the Department.

The **Geoenergy Center** will become the centerpiece of the Department's activities in applied geosciences for the next several decades. The Center will leverage the successful twenty-five year history of excellence of the **Energy and Minerals Applied Research Center (EMARC),** led by internationally-known and former AAPG[i] President Paul Weimer. The Geoenergy Center will play two vital roles.

- **Organizing Industry Programs:** For those faculty primarily working in energy-related research, including the Benson Chair in Petroleum Geosciences, currently held by Professor Weimer, and a new Geoenergy Chair, the center will provide the mechanism for organizing industry consortia programs, a role served well by EMARC over the past 25 years.

- **Engaging Faculty:** The Geoenergy Center will serve as the bridge required for joining the "pure" research taking place in the department with potential energy industry applications. It will engage faculty members who are interested in applying their specific research expertise to energy-related issues but have not previously been involved in the energy sector. Geological Sciences faculty expertise currently exists in many areas relevant to, but not yet explicitly directed towards, energy research including hydrogen generation, geothermochronology, and metal ore deposit formation.

"**Bridging" activities** conducted by the Center would include short course development, symposia, colloquia, and short term visits by industry scientists. These activities will inform department faculty and graduate and undergraduate students on current research trends in the energy industries and will support the rich collaborations among Geological Sciences faculty and students to develop ideas for interdisciplinary, energy-related projects that explicitly take advantage of research expertise unique to the Department. The Center should be considered as the equivalent of a **business incubator** in which

entrepreneurial business practices are used to develop innovative geoenergy-related research activities.

The Department will leverage the focused activities in the Center through **strategic faculty hiring in "Geoenergy"** to strengthen and coordinate with departmental teaching and research activities. This cluster hire of four new positions through the College of Arts and Sciences will be departmental tenure-track faculty in the general fields of geophysics, rock physics, sedimentology/stratigraphy, economic geology, and hydrocarbon reservoir characterization.

Investment Opportunities

The Geoenergy Initiative and related Center seeks an investment of $13.5 million to create an endowment that will sustainably foster this entrepreneurial approach to geoenergy research with the resources to allow faculty to operate effectively in this arena. Funding a core investment in three major areas will create the initial critical mass to establish a sustainable and robust initiative.

- **A "named" Chair in Geoenergy Science**: The Chair will be a tenure-track faculty member with considerable industry experience who has the vision and expertise to both run their own energy-related research programs, as well as spearhead efforts to engage the entire faculty in energy-related research and teaching activities. Adding a second "long term" position to the extant Benson Endowed Chair in Petroleum Geosciences will provide a robust, stable presence for the department in geoenergy activities.
- **A "named" Visiting Chair in Geoenergy Science:** These "medium term", rotating visiting Chairs will be targeted for individuals with successful careers in industry or government who can teach classes in their specialty and organize informational short courses, symposia, colloquia. Visiting chairs are critical for maintaining an entrepreneurial spirit in the department, by continually providing "in depth" exposure to faculty and students of new issues and opportunities developing throughout the energy industry.
- **An "operating fund" for support of short courses, symposia, colloquia:** These short term activities are required to provide faculty and students with up-to-date information on research needs of energy industry. This fund would be used to support two short courses per year, two to three innovation research grants per year, and colloquium speakers ($10,000).

Complementing the central core of the Geoenergy Initiative's resources with support for professorships and students will provide the opportunity for CU-Boulder to attract and retain the next the generation of academic and student talent creating a fully-formed culture of excellence in this innovative and critical area.

- **Four endowed professorships in Geoenergy Science:** Endowing four professorships will provide critical resources for attracting and retaining the

next generation of teaching and research talent. These professorships will be awarded to faculty who are hired for research and teaching excellence in their area of expertise who will collaborate with the Geoenergy Center.

- **Graduate Student support:** We continue to make Geological Sciences graduate student a priority and we will continue to seek funds to support graduate students interested in geoenergy research.

Legacy investment - Setting the path for CU-Boulder's 21st century leadership in world-class geoenergy research and education

Investment in an endowment to support these core and complementary pieces of the Geoenergy Initiative will create a world-class, robust, long-lasting culture that will leverage CU-Boulder's recognized leadership as in Geosciences education and research. Endowment amounts are targeted to provide a competitive salary with peer institutions to attract and retain leading faculty and the best students. Nationally known leaders in the field will bring critical research awards and faculty relationships to benefit the reputation of the campus, the quality of teaching and research, and the entire state of Colorado.

Please contact Department Chair Shemin Ge directly (ges@colorado.edu) if you have questions regarding this ambitious initiative and how you can help make it a reality.