A PROPOSAL *for the creation of*

The Continental Resources Center *for* Energy Research *and* Technology

IN SUPPORT OF

The University of Oklahoma




EXECUTIVE SUMMARY

For more than 100 years, the University of Oklahoma has been a global leader in energy education and research. Our alumni have created and led some of the world's most innovative and entrepreneurial energy companies, leaving a significant OU imprint across an industry that is the most important engine of global economic growth. Likewise, our research programs have led to knowledge creation that is intellectually stimulating to our academy members and yet impactful to our strategic private sector partners in enhancing their shareholder value. While this is our legacy of energy education and research at the University of Oklahoma, our vision for the future is even brighter.

OU's Mewbourne College of Earth and Energy, College of Engineering, and Michael F. Price College of Business each maintain substantial portfolios of energy expertise, energy curricula and diverse student bodies with the character, intellect and passion to become the next generation of energy industry leaders. As stand-alone colleges, these three campus jewels will continue to recruit, develop and graduate exceptional young women and men, thanks to our deep commitment to provide each with a rich laboratory/experiential learning experience that has served generations of OU alumni so well. However, imagine the possibilities and the potential impact on our students, teaching, research and our private sector partners if we encourage an intellectual collision among these three outstanding colleges – the ***Continental Resources Center for Energy Research and Technology.***

OU has developed a special relationship with Continental Resources based on mutual respect, a strong sense of community, and the desire to be world-class. Now, as OU and Continental Resources emerge as international leaders and role models in their respective fields, it is the University of Oklahoma's strong desire to enhance our existing partnership through a leadership gift that will send a powerful message about Continental Resources' commitment to excellence in education and the State of Oklahoma.

The University of Oklahoma proposes that this partnership manifest itself through a transformational gift of $25 million from Continental Resources. It is OU's hope that this initial investment could lead to additional opportunities over the next seven to 10 years through this unique partnership. The $25 million contribution, which could be made over a mutually agreed upon period of time, will construct a building that will become the new hub of the University of Oklahoma's energy enterprise — *The Continental Resources Center for Energy Research and Technology.*

The lobby area of the new building will be named in honor of Harold Hamm, the founder of the company, and would recognize his contributions to the industry and the state.

As Continental Resources further develops its market, research and thought leadership in oil and gas development throughout the U.S., the proposed center at OU will help define the company's unique niche and position in the industry. It is also important to note that OU greatly values its relationship with Mr. Hamm and his leadership team and welcomes their ideas and input.

THE CONTINENTAL RESOURCES CENTER FOR ENERGY RESEARCH AND TECHNOLOGY

The Continental Resources Center for Energy Research and Technology building will provide state-of-the-art space for key energy programs at OU and represent the physical and symbolic home of entrepreneurial, interdisciplinary energy programs that build on and amplify OU's global reputation for excellence and innovation in the area of energy.

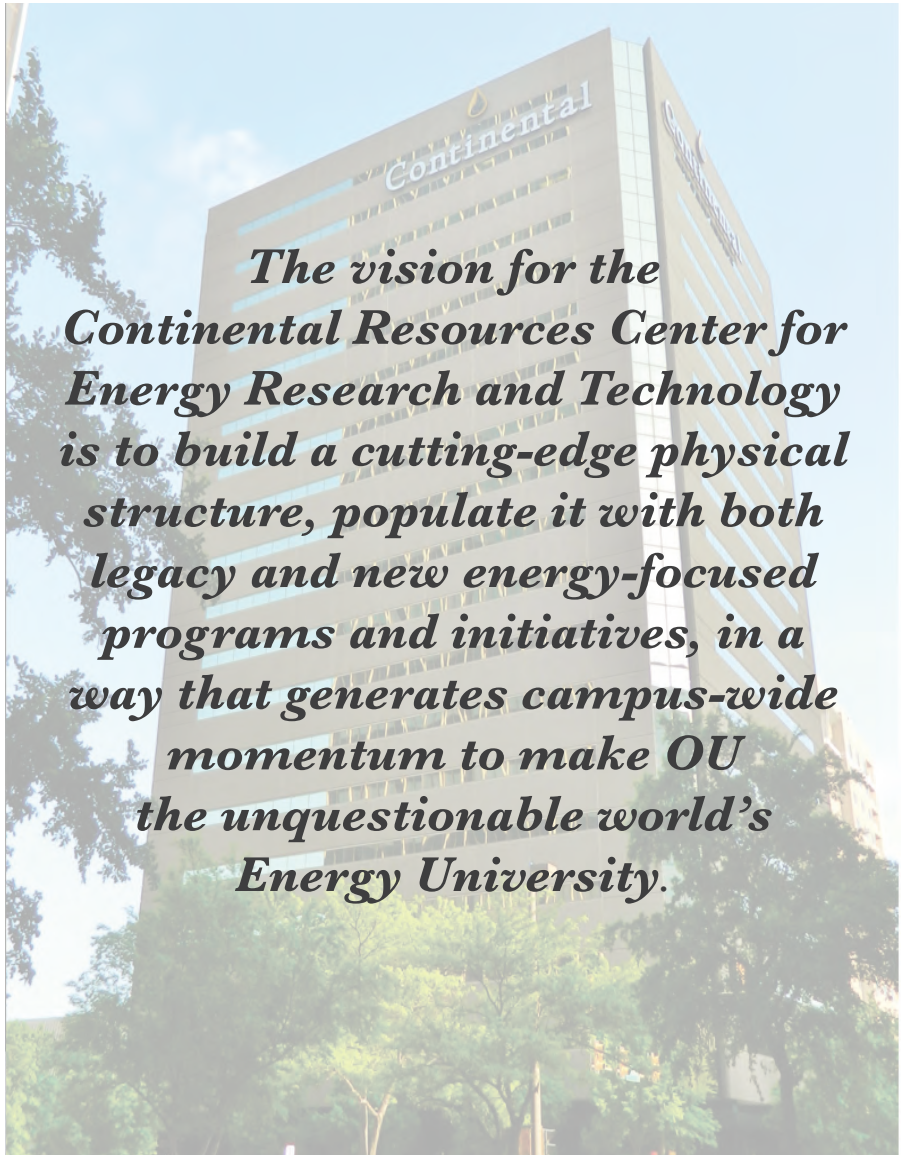
We envision that the Continental Resources Center for Energy Research and Technology will:

1) Become the hub for campus-wide program development and collaboration in OU's energy enterprise. The Continental Resources Center for Energy Research and Technology will be directed by the collaborative leadership of the three principal colleges — Mewbourne, Price and Engineering — as well as other campus-wide stakeholders.

2) Become an internationally visible center for the continuous enhancement of OU's energy brand and the critical and central point of interface for industry and the academy.

3) Create a physical ecosystem that fosters creative collaboration across departments and colleges, allowing OU to deliver an unsurpassed experiential energy education to our students.

4) Develop and deploy customized learning opportunities for our strategic industry partners that will enhance their strategic and tactical decision-making in order to maximize shareholder value.



The vision for the Continental Resources Center for Energy Research and Technology is to build a cutting-edge physical structure, populate it with both legacy and new energy-focused programs and initiatives, in a way that generates campus-wide momentum to make OU the unquestionable world's Energy University.

5) Focus on developing real-time practical solutions to the industry's toughest challenges.

The center will contain up to 50,000 square feet, dedicated to student-focused and laboratory-based experiential learning. The collaborative nature and design of the Continental Resources Center for Energy Research and Technology will be a catalyst for the development of an array of new academic and research programs, including online master's degrees, certificates and other credentialing programs in key areas of interest to the energy industry as well as the delivery of other forms of advanced and executive training and seminars.

These could include programs with a technical focus (for example Petrophysics, Reservoir Characterization, Data Sciences and Analytics), with components that would introduce the link between the underlying physics and engineering and tools such as predictive analytics.

As a research institution with a goal of teaching its students from the knowledge created by its own research, the following are examples of programs, projects, initiatives and laboratories that are under consideration for inclusion in the Continental Resources Center for Energy Research and Technology:

NEW TECHNOLOGIES

- The study of rock properties of unconventional reservoirs at pore (nano) scale, including porosity definition and distribution in shales and implications for hydraulic fracturing and fluid flow.
- Development of new technologies through advanced physical studies such as petrophysics, advanced reservoir modeling, and multiphase fluid mechanics.
- Multidisciplinary studies linking the concepts above in support of new technologies in horizontal drilling.

PETROLEUM ENGINEERING

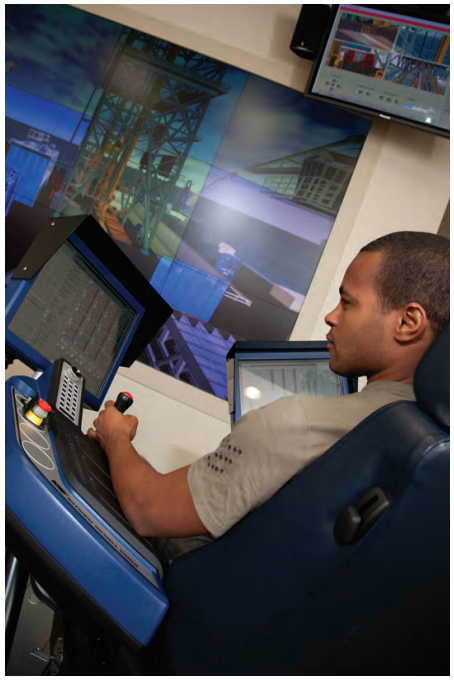
- Rock mechanics at the "core scale" to study larger scale effects of fracturing and deformation to support pore scale studies.
- Petrophysics to link borehole measurements with the laboratory measurements of various rock properties to better understand the relationship between laboratory results and well measurements.
- Theoretical modeling to incorporate laboratory results in advanced reservoir modeling of micro-pore reservoirs.

GEOLOGY AND GEOPHYSICS

- Reservoir characterization to better understand depositional environments of unconventional reservoirs and variations in these reservoirs in the context of basin-scale concepts.
- Seismic attribute studies to better understand how advanced interpretation can relate seismic acoustic properties to rock properties determined from laboratory research.
- Through petrophysics, link geology, geophysics and reservoir engineering.

MECHANICAL ENGINEERING

- Production-related multiphase fluid mechanics with emphasis on oil and gas industry applications, including enhance oil recovery, horizontal drilling, flow through wellbore and other turbo-machinery applications related to energy production.
- Analysis and design of turbo-machinery, including compressors, mechanical drives, generator sets and turbines. This includes work on systems compatibility, performance diagnostics, reliability and efficiency improvements.

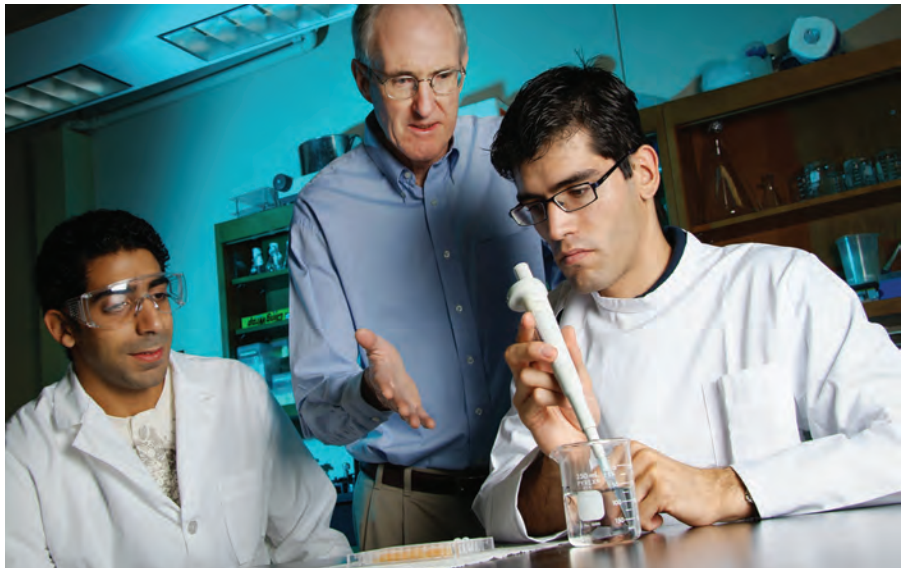


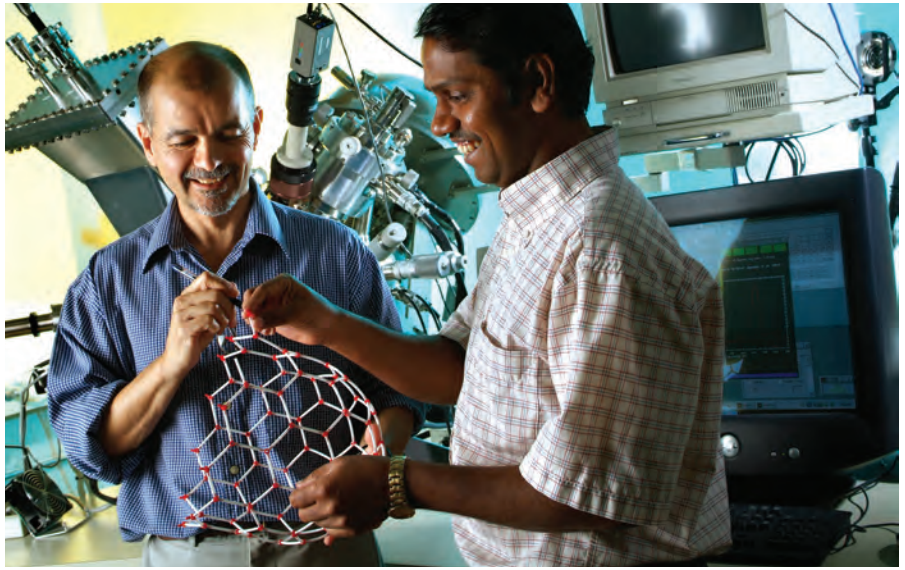
CHEMICAL ENGINEERING

- Computational expertise using atomic and/or molecular modeling to support research in several energy-related areas, such as water decontamination and oil mobility in porous media.
- Water treatment research to study applications such as treatment of brackish water (for example flow-back water or co-produced water) and treatment of brackish groundwater to substitute for freshwater.
- Design of advanced separation treatment systems.
- Process systems engineering, particularly the optimization of industrial processes to minimize (or eliminate) industrial freshwater consumption.

COMPUTER SCIENCE

- Multi-disciplinary approach to better understand and manage energy development, based on results from scientific and engineering research, operational data streams, and "next generation tools" utilizing statistical, analytical and information modeling techniques (such as predictive analytics).





BUSINESS

- Understanding of business impacts, such as capital efficiency, asset valuation, and complex project management.
- In the area of policy, leverage collective perspectives of internal and external OU experts to craft recommendations to move national and global energy policy forward.
- In entrepreneurship, field interdisciplinary teams of students, faculty, and industry mentors to accelerate the energy-related new venture development.
- In Management Information Systems, deploy the power of "big data" analytics to aid energy-related business decision making.
- In Energy Finance and Risk Management, perform financial and risk Modeling via public and private sector data models (the National Energy Modeling System and Deloitte's MarketPointe) to aid predictive decision making.
- Put together a program to teach the global marketing of the oil and gas industry and collect data on the economic impact of the oil and gas industry in Oklahoma and other states with vested interests.

SUMMARY

The extraordinary partnership proposed between the three stakeholder colleges and Continental Resources has the potential to transform energy education and research at the University of Oklahoma. The partnership will benefit generations of students on campus, open up countless opportunities to impact energy education throughout the world and help our knowledge-based community grow to become an engine for global economic success.

Additionally, the investment from Continental Resources will help OU address issues that are some of the nation's most critical, including:

- Nurturing new research discoveries and technological innovations that can potentially help the industries we serve, including our critical legacy partnerships with energy companies and new partnerships in such emerging areas as bioengineering. We also believe these discoveries and innovations will open new entrepreneurial avenues that can strengthen the economy of our state and nation.
- Educating students in an innovative, experiential, and cross-disciplinary manner so they can succeed in today's complex, intensely competitive and global environment and become the next generation of American and global energy business and community leaders.
- Encouraging students in energy-related majors at the undergraduate and graduate level in order to increase the number of OU graduates in these fields in response to the needs of the nation.

In addition to honoring Continental Resources' transformative gift through the naming of the center, the University also would name the lobby area of the new building in honor of Harold Hamm, the founder of the company, and would recognize his contributions to the industry and the state.

Continental
RESOURCES