

# *University of Houston: Engagement, Workforce, and Economic Development*

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**T**he role of universities in promoting economic and workforce development remains an emerging field. For most of the 20<sup>th</sup> century, it was somewhat implicit that universities played a role in providing a broad-based higher education that gave graduates the critical-thinking skills and social maturity to assume a wide range of jobs in the American economy. Similarly, it was often implicit that universities were engines of economic growth that provided income to faculty and staff, attracted students who bought goods and services, and financed expansion of facilities and created a host of construction and service-related jobs.

In the last decade, our environment has changed quickly and dramatically. Public finance for higher education has been steadily eroding since the 1970s. After the recession of 2007, unprecedented cuts to higher education weakened many institutions and left them increasingly dependent on other sources of revenue to sustain their operations. Perhaps ironically, there is also mounting political pressure for universities to be held more accountable for the public funding that they do receive. On a more fundamental level, universities are also facing questions related to the relevance and value of the educations they provide to students. If lengthy periods of study, increasing tuition costs, and high student loan debt produce degreed individuals with no jobs, where is the public good? Exactly what are universities doing

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about economic and workforce development to justify continued public moral and financial support?

At many universities, addressing these questions is left to formal and informal organizations charged with developing strategies to assess economic impact, promote economic development, align educational programs with the workforce, and engage in advocacy at all levels. To be fair, these kinds of organizations have existed for decades at some universities, especially the land-grants. What appears to be different, however, is that these activities are now being promoted by senior leadership as critical to the long-term success of their institutions. These are the kinds of developments that David Shaffer and David Wright, of the Rockefeller Institute of Government, suggested was needed to create a “new paradigm for economic development.” In their 2010 report, Shaffer and Wright said that a truly pragmatic approach was required where higher-education leaders partnered effectively with business leadership on common economic issues. Furthermore, this level of engagement is vital so that universities might better address what Mary Walshok has termed “America’s Job Gap.” Walshok and others have suggested that there is currently an approximately 30 percent gap in the skills obtained by graduates of American higher education and the actual skills required by employers. The opportunity exists, therefore, for universities to reorient their activities through a strategy of thoughtful engagement that will produce graduates with needed skills, promote economic development, and demonstrate their extrinsic value to public stakeholders.<sup>1</sup>

At the University of Houston (UH), the arrival of a new chancellor/president in 2007 resulted in a strategic environmental scan to determine areas where the university’s efforts should be focused over the next ten years. Several major initiatives were launched, including one that sought to make UH a major energy university. The decision to embrace energy was a natural one given the institution’s location in the “energy capital of the world.” Despite considerable economic diversification since the oil bust of the 1980s, energy is still responsible for almost 50 percent of all economic activity in the greater Houston MSA. That a strategy focused on aligning with the energy industry made sense was a given; more difficult was the task of developing and implementing a strategy that produced positive benefits for the university, industry, and the community. This article describes the key elements of that strategy.

## TOP-LEVEL ENGAGEMENT

Despite its name, the University of Houston has not had a particularly deep and meaningful relationship with the city or its major employers. To be sure, there were key supporters of the institution in both the private and public sector, but there were not many initiatives where the university and the community were heavily involved for a common purpose. As the university was looking to develop its credibility as an “energy university,” the Greater Houston Partnership (GHP)—the region’s business advocacy and economic development organization—was launching a complex, multi-faceted effort aimed at perpetuating Houston’s role as the undisputed global leader in the field of energy. University leaders connected with the GHP on multiple levels to determine how UH could be a part of the campaign. Within a few years, key administrators from UH had assumed leadership roles at the GHP, leading a host of committees and subcommittees dealing with issues such as energy workforce, technology commercialization and development, and energy policy. On numerous occasions, the university worked closely with the GHP to recruit additional energy companies to the region by touting the advantages of having a local university committed to energy education and research. Finally, CEOs of major energy companies were recruited to serve on the UH President’s Energy Advisory Board. Within a year, irregular and unfocused conversations between the university and energy companies had become a frequent and dynamic exchange of ideas at many different levels.

The strategy of pursuing thoughtful and sustained engagement with the GHP and regional energy companies has produced many positive benefits. In a very tangible way, it has led to significant increases in philanthropy to the university to fund energy-related activities. Donations from several large energy companies served as cornerstone gifts for a new petroleum engineering building. Other gifts have gone to support the development of unique programs related to subsea oil and gas exploration. Over a million dollars a year is provided for programs aimed at bringing youth into the STEM talent pipeline and scholarships once they matriculate. Perhaps most important, the strategy of engagement has strengthened the visibility and credibility of the university in the business community. In the last session of the state legislature, the GHP advocated for “Tier One” status for the University of Houston and the ability to receive additional financial support from the state’s permanent university fund. These efforts were successful and will produce an extra \$8 to \$10 million per year over the next five years.

### CRADLE TO CAREER

Engaging key political leaders and individuals at the highest level of major companies produced positive results that benefited the university, industry, and the community. These activities produced results at a macro level and improved the image, reputation, and bottom line of the University of Houston and its business partners. Much of the hard work, however, has been accomplished by individuals working in an interconnected matrix of organizations that are all focused on developing the energy talent pipeline. Recognizing that sustained economic development and job growth ultimately require a trained, available workforce, the University of Houston is actively involved “in the trenches” to create new systems and programs to meet very significant workforce needs from cradle to career. In other words, the context of our energy strategy recognizes that tomorrow’s university students and energy workforce are sitting in elementary schools today. The strategy also recognizes that students “swirl” in pursuit of higher education and rarely start and finish at a single institution. And, equally important, the strategy takes into account how rapid change takes place in industry and the need to be flexible and responsive.

A key linchpin of this effort is the All Kids Alliance, hosted at the University of Houston and directed by the former dean of the College of Education. The million children in K-12 in the Houston region are an amazing source for future workers in energy fields. Unfortunately, too few of these students graduate from high school, have the requisite math and science skills to move into technical fields, or lack the inclination to take jobs in energy due to career bias. The All Kids Alliance provides support and leadership to dozens of regional councils composed of neighborhood school districts, their closest higher education partner(s), local businesses, nonprofits, and faith-based community organizations to remove barriers to student success. In addition, the Alliance promotes career awareness and engagement activities across the educational continuum. It is not a one-size-fits-all solution, but it does provide a rigorous framework that uses data to identify problems, a Six Sigma process to find solutions and best practices, and an evaluation methodology for providing continuous improvement. As examples, a number of regional councils, using data and coaching from the Alliance, are working on programs that will address math achievement in the eighth grade with a goal of increasing the number of high school students that are calculus ready. Others have targeted increasing the number of high school graduates who matriculate into some kind of

higher education within their first year of graduation. Although in its early stages, All Kids Alliance has already received considerable public acclaim for convening many of the region's stakeholders to tackle serious issues, for its unique hub-and-spoke structure that empowers communities, and for emphasizing a systems—not project-based—approach.

At the other end of the educational spectrum, the University of Houston has forged strong relationships with regional community colleges with a goal of encouraging and facilitating transfer. National data indicate that fewer than 25 percent of community-college students ever even apply to a university. In Houston, with over 250,000 students in community colleges in 2012, this represents a huge potential loss of engineers, geoscientists, and highly skilled technical workers. For almost a decade, the University of Houston has had joint admissions agreements in place with area community colleges. These agreements, however, were never operationalized until the university began to “embed” its advisors in the community colleges. Today, UH has an advising presence at seven area community colleges and serves the entire region through an e-advising portal. Thousands of students participate in the joint admissions program, obtain approved degree plans, use the UH Library, and attend athletic and special events at the University at UH student rates. Equally important, UH has developed bachelor's degree completion programs for students who pursued or completed a technical or workforce curriculum at the community college. This is particularly important in Houston, where large numbers of students complete technical programs in fields such as welding or process control, enter the workforce, and require additional education to move into supervisory positions.

The new academic programs related to energy have benefited significantly from a host of university-industry advisory boards. Most often, industry representatives possess advanced degrees in their field or are human-resource experts charged with developing corporate talent. Dozens of these boards currently exist at UH, but two are particularly notable. As the university pursued its energy agenda, a common theme came up often. Industry made it clear that UH would never be taken seriously as an energy university without an undergraduate program in petroleum engineering (PE). Like many schools, UH eliminated its undergraduate PE program in the 1980s due to the oil bust and a sluggish job market for graduates. The last decade, however has witnessed a remarkable turnaround: hundreds of vacant PE jobs available in Houston on a regular basis. The UH Petroleum Engineering Advisory Board was formed to advise UH on curriculum is-

sues and to raise money to re-launch the program. Conversations with the board resulted in a unique curriculum aligned with the needs of industry. More specifically, the UH PE program recognizes that today's petroleum engineer must be able to work in the "digital oilfield" and have the organizational and business skills to manage projects. In less than two years, with the help of the PE Advisory Board, UH re-launched its undergraduate PE program with over \$12 million in external funding and a new state-of-the-art classroom/lab building.

Similarly, the university has worked closely with other segments of the energy industry to develop unique curricula to meet specialized workforce needs such as engineers with the skills to explore and recover oil in difficult environments. In 2008, UH established an advisory board of major oil companies and their largest contractors to see how our programs could be modified to better train engineers to work in offshore and deep-water environments. The 2010 BP Macondo blowout in the Gulf of Mexico accelerated these conversations and created a sense of urgency to respond. With a strong emphasis on safety and quality assurance, UH launched new programs in offshore well completion and well intervention. At present, we are seeking state approval for another degree in subsea engineering. All three programs were designed in collaboration with industry, have received strong financial support, and are the only programs of their kind in the Americas.

## **FINANCIAL ENGAGEMENT**

A final element in the University of Houston's economic and workforce strategy involved making a significant financial investment in the physical infrastructure to support education, research, technology development, and commercialization. This investment was targeted to take advantage of the most obvious economic cluster of opportunity, energy. In late 2009, the university acquired the former headquarters of Schlumberger Well Services for \$27.5 million. The complex, renamed the University of Houston Energy Research Park (ERP), includes 15 buildings with over 690,000 square feet of space on 74 acres.

Although in the early stages of development, there has been significant progress made at the ERP. In 2011, the University's petroleum engineering moved into a two-story building at ERP that was transformed with over \$12 million in improvements. The state-of-the-art educational facility was renamed the Conoco Phillips Petroleum Engineering Building in early 2012.

In late 2012, the UH Energy Education and Conference Center will open and serve as a hub for an interdisciplinary team of faculty working in areas ranging from smart materials to energy policy. The conference center will also serve as the home for the Center for Energy Operations, which is aimed at providing critical workforce training on a noncredit basis to address the most severe talent gaps and to provide ongoing professional development.

In the area of research, the ERP has already attracted external funding for the Texas Diesel Testing and Research Center (TDTRC), a comprehensive research, development, and testing operation for advanced power-train, renewable or alternative fuels, and emission control systems. The primary users of the facility are local, state, and federal agencies as well as energy, engine, and emission-control industries. The key goal is to produce cleaner emissions, identify alternative fuel options, and improve overall fuel economy in medium- and heavy-duty vehicles. In addition, over \$25 million has been secured from state, federal, and industry partners to develop an Energy Devices Fabrication Laboratory. Much of this work is being done in partnership with a group of research and scientists from a major electric power company that relocated their research and development operations from New York. The crux of these activities is to utilize new technologies to transmit power through high capacity, superconducting materials in order to improve efficiency in power generation, storage, and transmission.


The longer-term plan for the ERP is to continue to expand efforts to build research centers and education/workforce programs at the site. Interdisciplinary programs in wind power, petroleum operations, and smart grid are already being developed and should launch no later than 2014. In addition, dozens of other companies are looking to partner with us to jointly expand our research and development activity. As new technologies are developed at the ERP, they will benefit from a technology commercialization unit that is already in place.

The decision to make the investment in launching the Energy Research Park was one that was based on a number of important factors that may be relevant for many other institutions. First and foremost, it had to be understood as a long-term investment that would take 15 to 20 years to realize its full potential. Second, it had to be developed in a manner that aligned with a major economic cluster in the region and validated through conversations with key potential stakeholders. Third, it needed to have the support of the university community so they could recognize significant short-term benefits in the acquisition of the park. This was framed in the



context of providing desperately needed space for educational and research expansion and the quick move of academic programs and research centers into the new space. In other words, we needed some quick wins to gain initial support for the project. Finally, the decision needed to support larger strategic goals for the University of Houston and the region. As mentioned previously, the university had staked out a position of becoming a major energy university and the Greater Houston Partnership was embarking on a major campaign to perpetuate the region's position as the "energy capital." The acquisition of the park confirmed the seriousness of the university's intent to the public, received enthusiastic support in the local media, and helped cement our linkage with key business partners and public agencies.

### FINAL THOUGHTS

The circumstances and context of each higher education institution is different. The University of Houston has clearly benefited from its location in the energy capital of the world and the opportunity to network and engage with leaders from global energy companies. As we know, continuing education units have been actively engaged in our communities for decades. The arrival of new leadership at the University of Houston made it possible to pursue a strategy that made the institution a part of the city it served rather than apart from it. Strong support from executive leadership is required to produce a supportive culture for outreach and engagement. In addition, support must run deep in an organization for maximum impact. In other words, the cooperation and participation of multiple university units is often required to address the challenges and opportunities that are present. Finally, to the extent possible, universities should commit new resources or reallocate existing ones to support goals related to regional economic development and job creation. If these strategies are pursued over the long term, universities can demonstrate value to the community, strengthen public and private support for their core activities, and regain their central position in the conversation over the place of higher education in modern American society. 

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