

An Energy Vision
The Energy Production and Infrastructure Center

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There is little doubt that the supply of energy in both the southeast and globally must rise dramatically during the next decade to meet the growing needs of an expanding economy. An opportunity in energy education and research is emerging with the potential to significantly impact the Lee College of Engineering, the Charlotte Research Institute(CRI), and some of our major regional industries. Energy supply is directly tied to economic growth; without an adequate supply of energy, there can be no sustained economic growth. Key elements needed to support this industry include engineering education and research in energy production and infrastructure. Energy production includes fossil fuels, nuclear, and numerous alternative technologies such as fuel cells, wind, solar, and bio-sources. Infrastructure refers to the engineering structure needed to support power generation and distribution. Energy production and infrastructure has evolved as a major regional industry it is clear that this industry will continue to grow and thrive in the region.

The impact of the pending energy problems was presented at a campus presentation last October. Tom Christopher, President of AREVA NP Inc, described impending regular brown-outs that the US can expect in the next decade or sooner. He described the critical need for more power generation and the infrastructure to deliver it. Obviously, nuclear energy is emerging as an essential element and the team necessary to support this industry comes from all engineering disciplines. In addition to reactor design, the nuclear industry must contend with major structural engineering issues, power supply components and control, fluid flow, and heat transfer issues. To some degree, the number of actual nuclear engineers needed is probably modest compared to the total number of engineers involved. Energy production is an issue of critical national importance, and UNC Charlotte and the Charlotte region is poised to be a major leader in energy production and delivery technology.

Two of the major industrial sectors in the Charlotte region are the power and construction industries. Both play a central role in the energy enterprise. Charlotte is home to Duke Power, AREVA, EPRI, Parsons, Shaw and numerous construction companies. As a result, the college is developing an **Energy Production and Infrastructure Center (EPIC)** that would be a collaborative effort among the Departments of Electrical and Computer Engineering, Civil Engineering, and Engineering Technology. It would also involve the Belk College of Business, the College of Architecture, the INES Ph.D. Program, and the Global Institute for Energy and Environmental Systems. This will be a novel research center both nationally and internationally. Building EPIC with the co-location of the ECE and CE departments would begin to shape a portion of CRI's research portfolio that will be important for years to come. This will provide a platform to reconfigure the college of engineering in a synergistic way.

A strong foundation with the ECE and CE departments is already present for the development of this new center. There are excellent long-standing relationships between the college and the local power and construction industries. The William States Lee College is named for a Duke leader, and there is a healthy tradition of financial support from Duke. A strong relationship has been rapidly growing with AREVA in recent years and they have been a primary employer of graduates from all disciplines within the college. The ECE department has maintained a power program for decades and is in the process of growing that program in response to input from their advisory board. Last year, ECE received a grant entitled "Power Engineering in The William States Lee College of Engineering UNC Charlotte" to enhance their power-related education and research initiatives from Duke. The CE department has close ties with most major construction companies in the region and many are heavily involved in energy infrastructure projects. College alumni hold high-level positions at both power and construction companies, and several serve on our advisory boards. EPRI is another major company in the energy business and faculty are currently engaged in EPRI funded research.

A world-class research and educational effort in the energy field will provide the workforce needed for the future of the energy and energy related construction industries. The EPIC center will also be a resource for research and applications development. The Lee College in partnership with regional industry is positioned and has the capability to realize this vision.