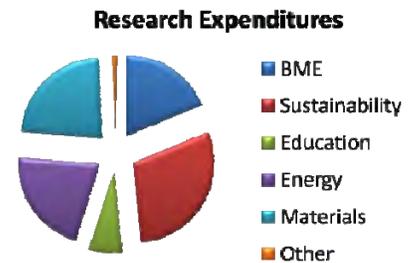


University of Houston Cullen College of Engineering
Cluster Project Overview
Energy

With UH establishing itself as “The Energy University,” there has been a major push to establish well-funded research in energy-related areas. The Energy Research Park will be home to many of these research programs, including alternative fuels, wind energy, superconductivity, and oil and natural gas research. Nearly 21% of FY11 research expenditures are generated by energy-related research projects such as:



Superconductivity

Venkat “Selva” Selvamanickam, Texas Center for Superconductivity (TcSUH)
Funded by the State of Texas Emerging Technology Fund, U.S. Department of Energy
Partnered with SuperPower, Waukesha Electric Systems, Oak Ridge National Laboratory, Southern California Edison

TcSUH researchers are looking to develop and commercialize high-temperature superconducting wire—materials that can cut down losses in energy transmission. These wires will have capabilities of carrying electrical currents further distances for longer periods, delivering up to 10 times more power than traditional cable technology. Selva and TcSUH researchers are working with SuperPower Inc. scientists to commercialize super efficient transformers, wind generators, cables and fault current limiters. Currently, the collaborators are working to manufacture a fault current limiting transformer for the nation’s power grid.

Offshore Wind Energy

Su Su Wang (ME) and Raymond Flumerfelt (ChBE), National Wind Energy Center
Funded by the U.S. Department of Energy

With the federal government attempting to fuel 30 percent of the nation’s electricity consumption through wind sources by 2030, researchers at the National Wind Energy Center are working establish an offshore wind energy operation to lead the nation toward this goal. They are working to develop advanced materials to be used in turbine blades and towers that can withstand extreme offshore conditions. In addition, they hope to streamline the manufacturing process for blades larger than 70 meters.

Lean-Burn Engines

Matthew Franchek and Karolos Grigoriadis (ME)
Funded by Ford, General Motors, Cummins Diesel, Army Research Center, National Science Foundation

Lean-burn engines are internal combustion engines regulated to run on a lower fuel-to-air ratio than standard engines while increasing fuel efficiency without sacrificing performance. Franchek and Grigoriadis are working to model engines, exhaust aftertreatment systems and engine diagnostic and control systems to enable automobile companies and manufacturers to design vehicles with more power, better fuel efficiency and reduced emissions.

Biofuels

Michael Harold (ChBE)

Texas Diesel Testing and Research Center

Funded by/Partnered with Sunrise Ridge Algae

Diesel Center researchers are working to examine the potential of algae as a renewable source of fuel. Unlike corn and soybeans, algae harvested as a biofuel will not compete with the production of current food crop and would only two percent of the nation's cropland to generate enough biofuel to meet half the country's fuel demand. Currently, Harold and Muncrief are looking for ways to tailor algae production that can be processed by today's refineries.

Tight Gas

Michael Nikolaou (ChBE)

Funded by U.S. Department of Energy Research Partnership to Secure Energy for America (RPSEA)

Partnered with Lawrence Berkeley National Laboratory and Texas A&M University

Part of an interdisciplinary team, Nikolaou is working to develop a self-teaching expert system for the analysis, design and prediction of gas production from tight gas reservoirs. The web-based system will allow exploration and production companies to mathematically model scenarios and develop predictions that can help them determine where to drill wells and how to produce from them.