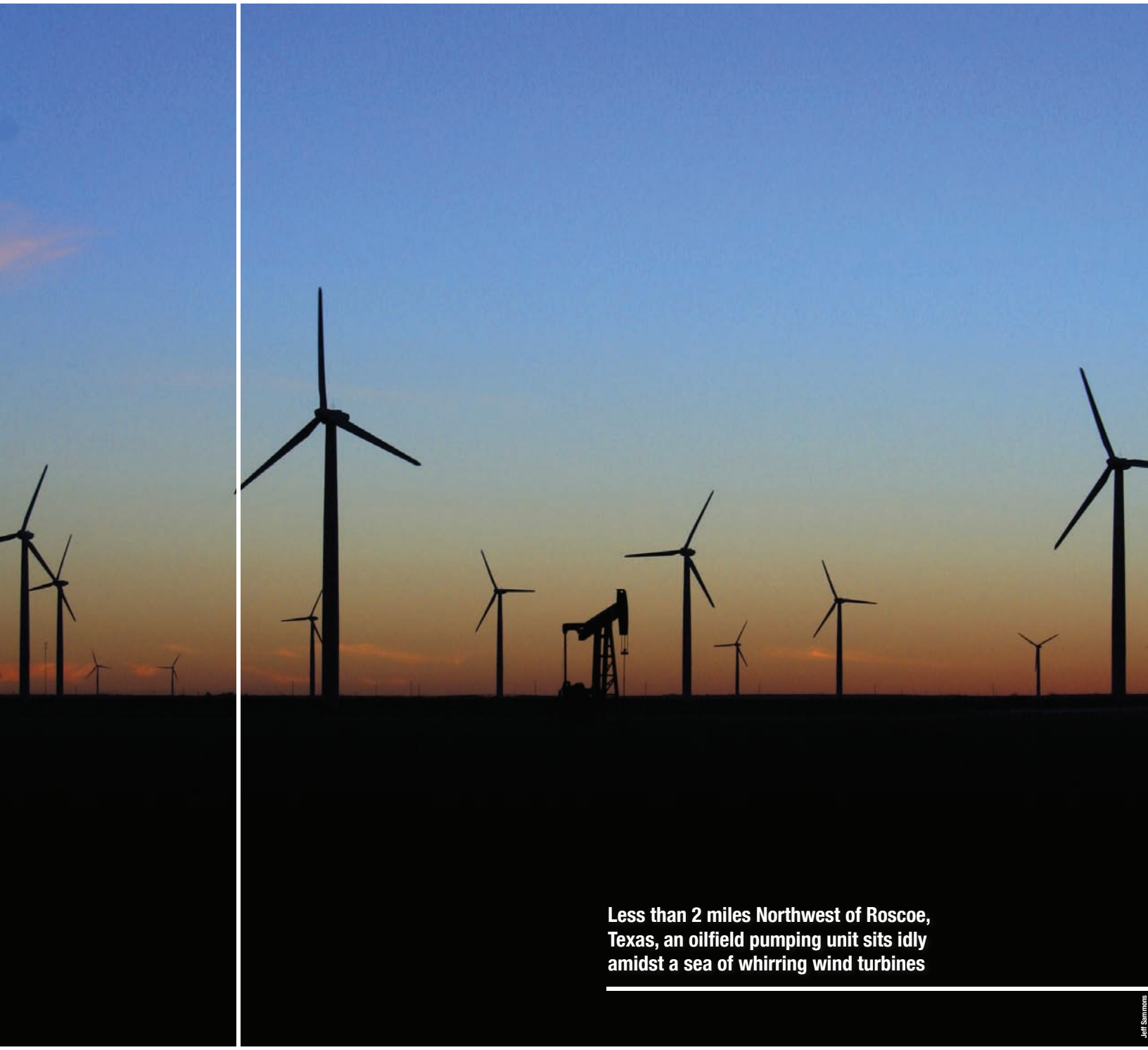
Engineering *Our* Future

Spring 2009

Texas Tech University - Edward E. Whitacre Jr. College of Engineering



Less than 2 miles Northwest of Roscoe, Texas, an oilfield pumping unit sits idly amidst a sea of whirring wind turbines

Jeff Simmons

Inside

Dean's Report

The Whitacre College of Engineering is dedicated to engineering our future through the education and transformation of students' lives. As we move to a new decade, we see the need for technical solutions to the nation's challenge in accessing sufficient and sustainable energy sources to power its future. We are committed to conducting cutting-edge research and providing educational programs related to traditional and unconventional energy production, storage, integration and infrastructure.

Our current expertise in oil and gas production, wind energy, biofuels, energetics and vehicle technologies will be complemented with investments like the generous donation of the J. F Maddox Foundation to create the new Donovan Maddox Distinguished Engineering Chair (page 4). In the next few years, we will grow research expertise in solar energy production (page 4-5), smart grids (page 7), energy storage (page 7), alternative fuels (page 11), alternative energy (page 8-9), and nuclear energy (page 6). Through this commitment to build a breadth and depth of research and workforce preparation programs related to energy, the college will become known as one of our nation's energy colleges, a critical player in charting the energy future of our nation.

Unfortunately, I will be unable to directly witness this exciting course for the university, as I have accepted the position of President of University of the Pacific in Stockton, California. Serving as the Dean of the Whitacre College of Engineering has been a tremendous opportunity. Our accomplishments over the past five years, such as the infusion of major gifts, the growth in research and graduate students, and the growth in undergraduate enrollments and high-quality student services, has positioned the college for an exciting future.

Texas Tech University
Dean, Whitacre College of Engineering
Pamela Eibeck, Ph.D., P.E.

I will remain at Texas Tech until mid-June, and begin at Pacific on July 1, 2009. I am pleased to let you know that Dr. Jon C. Strauss has been named the Interim Dean of Engineering, and he will begin on June 15. Dr. Strauss is currently the President of the Bainbridge Graduate Institute, President Emeritus of Harvey Mudd College, and President Emeritus of Worcester Polytechnic Institute.

The future is certainly bright for the Whitacre College of Engineering – and while I will miss helping shape that future – I know that the excellent faculty and staff of this college will keep our momentum going.

In This Energy Issue

News

Whitacre College of Engineering Names 2009 Distinguished Engineers

The Texas Tech University Edward E. Whitacre Jr. College of Engineering named Blake W. Augsburger, Chi-Ming Chang, James A. Edmiston, Shelby Johnson and J. G. "Greg" Soules as recipients of the 2009 Distinguished Engineer Award on April 3 at a luncheon on the Texas Tech campus.

The Distinguished Engineer Award was established during the 1966-67 academic year to recognize the most outstanding alumni of the college. Since that time, 194 graduates have received this honor.

Recipients of the award must be distinguished in their profession, an inspiration to their peers, and have demonstrated a continuing interest in areas outside the field of engineering.

Augsburger, of Mishawaka, Ind., is president and CEO of Harman Professional Group, the professional audio division of Harman International Inc. Harman International is a Fortune 500 company that designs and manufactures branded audio and infotainment products and systems for the automotive, consumer and professional customer. Augsberger earned a Bachelor of Science and a Master of Science in Electrical Engineering from Texas Tech in 1987 and 1989, respectively.

Chang, of Hu–Kou, Taiwan is the president of Ardentec Corporation, a wafer/IC testing company that he co-founded in 1999. Chang earned a Master of Science in Industrial Engineering and a Ph.D. from Texas Tech in 1983 and 1986, respectively. He received a Bachelor of Science in Industrial Engineering from Tunghai University in 1980.

Edmiston was elected president and CEO of Harvest Natural Resources Inc., based in Houston, Texas, in 2005. Edmiston received a Bachelor of Science in Petroleum Engineering from Texas Tech in 1982 and a Master of Business Administration from the Duke University Fuqua School of Business in 2004.

Johnson is the 70 percent-majority owner and president of the Theodore Williams Construction Company Inc. (TWCC), a New York City firm that specializes in projects associated with corporate interiors, including many Fortune 500 clients. Johnson holds a Bachelor of Science in Construction Engineering Technology from Texas Tech that she earned in 1986.

Soules is principal engineer for Chicago Bridge & Iron Company (CB&I) in The Woodlands, Texas. Soules earned a Bachelor of Science in Civil Engineering from Texas Tech in 1979 and a Master of Business Administration from The University of Houston in 1991. He completed a Master of Science in Civil Engineering this past semester at Texas Tech. *E*

2009 Distinguished Engineers of the Whitacre College of Engineering (L-R) Blake W. Augsburger, Chi-Ming Chang, Shelby Johnson, James A. Edmiston, and J. G. "Greg" Soules.

Solar Energy

J. F Maddox Foundation Donates $7.5M in Honor of Donovan Maddox

A $7.5 million gift announced Jan. 16 from the J. F Maddox Foundation to create the Donovan Maddox Distinguished Engineering Chair, gives Texas Tech University an advantage in its goal of leading the nation in energy solutions. The chair will be used to attract a world-class researcher in solar energy.

The new chair, in tribute and memory of Donovan Maddox, honors his life-long connection and commitment to Texas Tech University. The existing Jack Maddox Distinguished Engineering Chair, recently vacated with the passing of Henryk Temkin, will be used to recruit another nationally recognized researcher in an energy-related field.

"The Whitacre College of Engineering has an unprecedented opportunity to attract excellent individuals with the Maddox Chairs, to establish strong research capabilities, enhance teaching and to gain exceptional national visibility with these candidates," said President Guy Bailey.

Chancellor Kent Hance thanked the Maddox Foundation for its gift and continued support of the university.

"We appreciate all that the Maddox Foundation has done for Texas Tech. Gifts like this allow us to continue our growth and maintain our leadership position in engineering research and development."

With each Maddox chairholder bringing teaching and research capabilities in distinctive fields related to energy, the two Maddox Chair appointees could have a tremendous impact on the university's national reputation, while also attracting additional faculty members who will establish distinct, but complementary, areas of research excellence, said Pam Eibeck, dean of engineering.

"Having two large endowed chairs like the Maddox Chairs available at once is extraordinary, and the individuals that we attract at this time will enable us to position ourselves as a key player in providing energy solutions," said Eibeck.

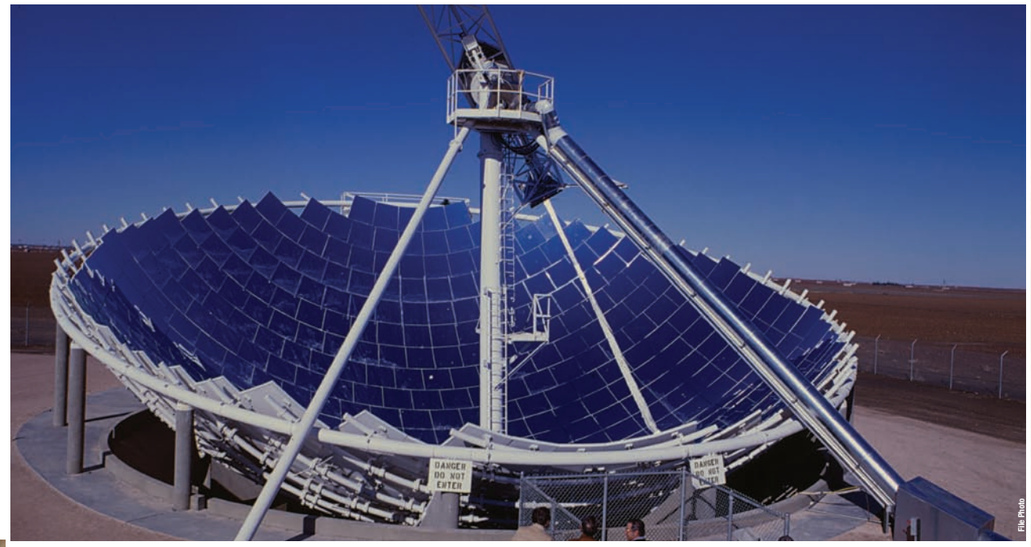
Jack and Donovan Maddox both majored in Textile Engineering, served as Student Government Association presidents, and were recognized as Distinguished Engineers and as Distinguished Alumni.

Donovan, younger brother of Jack Maddox, graduated in 1934 and served as Student Government Association president in 1931-32. He was named a Distinguished Engineer in 1971 and a Distinguished Alumnus in 1972. Donovan was selected by the Alumni Association to receive the Lauro F. Cavazos Award in 1988. Donovan, who died in 1993, had a long and successful career as a textile executive, primarily in Gastonia, N.C. He succeeded Jack as chairman and CEO of New Mexico Electric Service Co. and related entities in Hobbs, N.M. in 1978.

Jack and Mabel Maddox established the J. F Maddox Foundation in 1963 to serve the citizens of southeastern New Mexico. Donovan served as president of the J. F Maddox Foundation from Jack's death in 1978 until 1990. Additionally, Donovan made certain that the first major grant by the Maddox Foundation after the settlement of Jack's estate in the early 1980s be made to create the Jack Maddox Distinguished Engineering Chair, in honor of Jack. The J. F Maddox Foundation, a nonprofit corporation based in Hobbs, is governed by a board of directors primarily composed of Donovan Maddox's two sons, Don and Jim, and their children. *E*

Arlie Linmer

President Guy Bailey, Chancellor Kent Hance, and Dean Pamela Eibeck stand with Jim Maddox and Don Maddox, sons of Donovan Maddox at the news conference that announced the new chair.



File Photo

The Crosbyton Solar Power Project featured a large, fixed, spherical mirror that concentrated solar radiation onto a small, mobile boiler. Steam produced in the boiler is used to generate electrical power in a conventional way.

Looking Back: The Crosbyton Solar Power Project

On May 1, 1976, the Federal Energy Research and Development Administration awarded a $2.4 million research grant to Texas Tech University for a solar power project at Crosbyton. In addition, the United States Department of Energy signed a $2.5 million contract with Texas Tech for construction of a sixty-five-foot mirrored dish 2.5 miles south of Crosbyton. At the time it was the largest single solar collector in the world and was designed to reduce energy costs by converting solar power to electricity for use by the city-owned power plant.

Named the Crosbyton Solar Power Project, it was directed by the Department of Electrical Engineering and was the result of efforts begun in 1974 to find an alternative energy source to slow rapidly rising local utility rates. The bowl operated from 1980 until 1987, providing useful data for researchers and green energy for the City of Crosbyton.

The most prominent feature of the project, a 65-foot bowl-shaped solar dish lined with mirrors and tilted at an angle, was constructed to reap maximum sunlight, thereby concentrating the sun's heat and produce temperatures as high as 1,000 degrees F. The heat would be focused onto a receiver that heated water to create steam, and this steam would then be pumped through a turbine, which would in turn produce electricity. Dr. John D. Reichert was the director of the project. *E*

Nuclear

Don Kay and Clay Cash Chair Establishes Nuclear Program at Texas Tech

The Whitacre College of Engineering is proud to announce a $1.5 million gift from Don, Kay, Clay, and Ashley Cash. The gift will be used to establish the Don Kay and Clay Cash Engineering Chair. The chair will be used to attract a leader in nuclear engineering that will create and build a new program in nuclear engineering at Texas Tech University.

The gift was presented through the Don-Kay-Clay Cash Foundation, established in 1997 to provide general and operating support for the arts, health organizations, higher education, and human services. The foundation was set up by Don and Kay Cash and their son, Clay, all graduates of Texas Tech University and natives of the Texas Plains.

R. Don Cash received a Bachelor of Science in Industrial Engineering from Texas Tech in 1966. In 1990 he was honored as one of the charter members of the Texas Tech Industrial Engineering Academy, was named a Distinguished Engineer in 1992, and was recognized as a Distinguished Alumnus of the university in 1995.

Don recently retired as the chairman and CEO of the Board of Questar Corporation, a position he assumed in May, 1985. He held other positions at Questar and currently serves on five corporate boards in addition to the Texas Tech University Foundation board.

(L-R) Ashley Cash, Clay Cash, Kay Cash, and Don Cash

Kay received a degree in education from Texas Tech in 1967 and is now a retired English teacher. Clay earned a degree in business administration from Texas Tech in 1997 and is the vice president of operations at Atmos Energy. He is married to Ashley (Bowes) Cash of Amarillo.

The Cash Foundation has been very supportive of the Texas Tech University System over the years. Their scholarship and grant funding has benefitted the Rawls College of Business Administration, Department of Chemistry, College of Education, Whitacre College of Engineering, Graduate School, Honors College, and Alzheimer's research at the Texas Tech University Health Sciences Center.

Don Cash admits that "Texas Tech is our favorite place to give because it gave Kay, Clay and me the opportunities for successful careers." *E*

The Don Kay and Clay Cash Engineering Chair will be used to establish a nuclear engineering program at Texas Tech University.

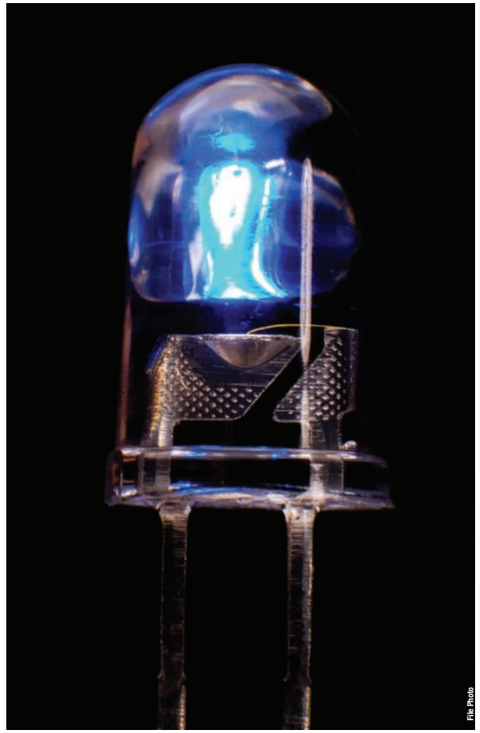
Electricity

Nano Tech Center: Conserving Energy to Light the World

The nanophotonics team in the Nano Tech Center (NTC), led by Drs. Mark Holtz, Hongxing Jiang, and Jingyu Lin, is performing research to improve the efficiency of fuel cells and thermo power by utilizing advanced electronic materials (InGaN). Devices made of these materials may be capable of capturing various wavelengths in the sunlight, which could enhance efficiency.

Jiang, Lin and the NTC team are researching and investigating the potential of commercializing novel solid-state lighting technologies, a highly efficient lighting technology with commercial, residential, and industrial applications.

Existing applications that have been developed by NTC researchers include single-chip alternating current-based light-emitting diodes (LEDs) that can be plugged directly into standard power outlets without power conversion and without external resistors, capacitors, or circuits. *E*



Texas Tech researchers have revolutionized LED devices.

Smart Grids and Storage of Renewable Energy-Generated Power

As renewable energy forms are researched and applied, provisions for their distribution are being made by Texas Tech researchers in the Department of Electrical and Computer Engineering.

Grid-connected wind turbines, solar power plants, and other renewable sources have peak production periods that do not necessarily match the peak demand times for energy customers. To maximize the efficiency of power generation, the "extra" power needs to be stored or saved so that it is not lost.

Research is being conducted on "smart grid" design and implementation, as well as novel storage methods that are unique to West Texas. Geographic characteristics, as well as the nature of the existing power grid provide Texas Tech with an excellent field research center. *E*

A smart grid delivers electricity from suppliers to consumers, saving energy, reducing costs and increasing reliability.

Wind Energy

Texas Tech Studies Transmitting West Texas Power to all of Texas

The West Texas Municipal Power Agency (WTMPA) – a Texas joint power agency and municipal corporation comprised of the cities of Brownfield, Floydada, Lubbock, and Tulia – has agreed to enter into a development agreement with Republic Power Partners LP to conduct a final feasibility study for extensive, prime-alternative energy sources, such as wind power, in the High Plains region served by WTMPA.

The project includes generation of power through wind, biomass, clean coal and other thermal energy sources and the transmission to provide a balanced, consistent source of electricity for local use, as well as selling surplus power by 2015 into the Electric Reliability Council of Texas (ERCOT), which controls 85 percent of the state's electrical load.

WTMPA, the Lubbock Economic Development Alliance (LEDA), Texas Tech University and Republic Power Partners have had extensive discussions to identify a significant economic development project to benefit the WTMPA service area. If the project goes forward, the cities and WTMPA will have access to these competitively priced sources of electricity after 2019 and the opportunity to become a center of surplus clean energy production. These benefits include the ability of Texas Tech to become a world leader in the research and development of enhanced wind energy technology.

"Texas Tech through our Wind Science and Engineering Research Center is already an expert on development of wind resources and we're excited about the opportunity to lend our expertise to this project with tremendous future potential," said Kent Hance, chancellor of Texas Tech University System. *E*

Modern Wind Farm

WISE Research Center Pilots Desalinization in West Texas

The Texas Tech University Wind Science and Engineering Research Center (WISE) in conjunction with the Texas Tech University Water Resources Center have collaborated through a $500,000 state grant to bring drinking water to West Texas citizens, in a green way.

The grant, from the Office of Rural Community Affairs (ORCA) Renewable Energy Demonstration Pilot Program, will help fund the $1.07 million project.

The partnership between ORCA, Texas Tech and Seminole is the first project in the United States to use wind power to desalinate drinking water for an inland municipality.

Seminole currently draws its drinking water from the Ogallala Aquifer, which is rapidly being depleted. The small town has no access to surface water supplies.

Pumping water from the brackish Dockum Aquifer (also known as the Santa Rosa Aquifer), which lies deep beneath the Ogallala, has been cost prohibitive because of the need to desalinate.

The ORCA grant will allow the installation of a 50-kilowatt wind turbine to power a reverse osmosis plant.

Seminole, a city of more than 6,000 people in Gaines County, about 80 miles southwest of Lubbock, currently uses about two million gallons a day on average from the Ogallala Aquifer. The wind turbine in the pilot project will provide the electricity for a reverse osmosis plant that, depending on the aquifer characteristics, will produce up to 30,000 gallons per day of drinking water for the city. *E*

Modern Wind Farm

Texas Tech Receives $1 Million Texas Workforce Commission Grant

Texas Tech University has received a $1 million Workforce Investment Act (WIA) Statewide Activity Fund grant from the Texas Workforce Commission (TWC) to support the creation of the Texas Wind Energy Institute.

The grant is being used to develop curriculum, expand capacity and prepare students to meet the workforce needs of the wind energy industry in Texas. The Texas Wind Energy Institute (TWEI) is a partnership between TTU and Texas State Technical College (TSTC) in collaboration with American Wind Energy Association, Lone Star Wind Alliance, Utility Wind Interest Group, Institute of Electrical and Electronic Engineers, and other energy-related organizations.

Texas Tech is now working with TSTC to train technicians, or windsmiths, to install, maintain, and repair wind turbines and related equipment. The program offers Wind Technician Certificates and an Associate's of Applied Science in Wind Energy Technician.

"TWC is proud to be part of the state's efforts to lead the way in developing wind energy for the future," TWC Chairman Tom Pauken said. "Through this grant, the state of Texas can leverage WIA funds to further develop a world-class workforce in industries with high demand such as renewable energy."

The Texas Wind Energy Institute aligns with Gov. Rick Perry's Industry Cluster Initiative and the Governor's Competitiveness Council recommendations for how Texas can continue to achieve long-term sustained economic success. These market-driven educational and training opportunities provide a skilled workforce to meet the short- and long-term needs of the industries within the Energy Cluster.

For more information, visit the TWEI at:
http://www.depts.ttu.edu/ode/windenergy/degrees.php *E*

Biofuels

Chemical Engineering of Non-Food Crops and Waste into Biofuels

Researchers in the Department of Chemical Engineering have been studying the generation of biofuels from non-food crops into ethanol and other biofuels. The research activities range from the effectiveness of the type of biomass used to the actual production processes.

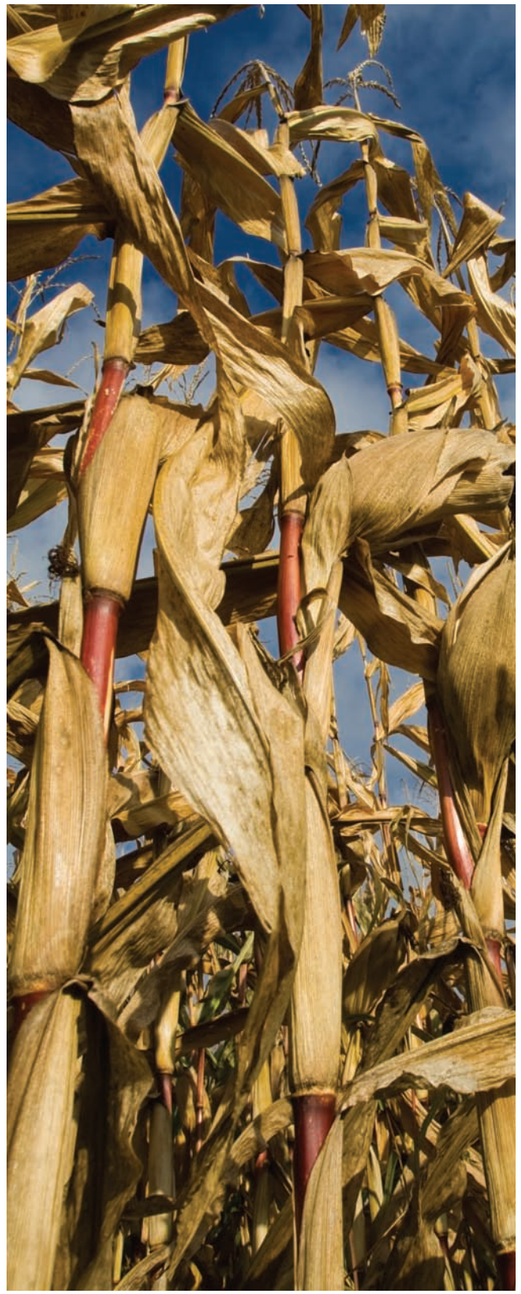
Dr. M. Nazmul Karim is investigating ethanol production from lignocellulosic biomass. This biomass is a carbon-neutral source of energy, as it comes from agricultural or forest residues. The ethanol produced from lignocelluloses will produce no net carbon dioxide in the earth's atmosphere, and can be used in as transportation fuel. This reduces the net green house gas emissions.

Specifically, in a Texas Commission for Higher Education Advanced Research Program-funded project, Karim is developing technologies to produce ethanol in a process that does not require enzymes, which is typically 25% of the normal cellulosic ethanol production cost.

The research focuses on developing recombinant microorganisms, which completes multiple functions. The process expresses the required enzymes on the cell surface, which degrades the cellulose to glucose; this in turn is taken up by the same microbe to produce ethanol. All of these are done in one single step. As a part of the research, Karim's group is also developing technologies to modify the process for industrial use.

In a collaborative research funded by the National Science Foundation, with Drs. Khare, Weeks and Li (Chemistry Department), Karim and the group are also developing computational and experimental methodologies to fundamentally address the issue of energetics of cellulose degradation. Molecular Dynamics simulations and atomic force microscope experiments are used to determine the energy and force requirements to pull a cellulose "sheet" from the cellulose surface.

The knowledge gained from these projects will allow the researchers to develop a better enzyme system in the future to efficiently degrade cellulose. *E*



Biofuels, including those produced with non-food crops, have potential to supplement other alternative energy sources.

Green Engineering

Building Stronger Houses and Businesses from the Ground Up

Compressed Earth Blocks (CEB) are a type of manufactured construction material formed in a mechanical press that forms an appropriate mix of earth into a compressed block. These blocks are stacked to create homes that are eco-friendly and are non-toxic, sound resistant, fire resistant, insect resistant, and mold resistant.

Texas Tech mechanical engineering faculty and students, led by Larry Williamson, the CEO of EarthCo Building Systems, Inc., have investigated and produced a CEB machine that is able to produce blocks that are compressed by as much as 3400 psi.

The design, the EarthCo Megablock™ and machine, is currently being implemented at the Rio Blanco Girl Scout Camp in Crosbyton, Texas to build a green Environmental Center. The project is sponsored by the Girl Scouts, Do Something, Leave No Trace, and EarthCo Building Systems. *E*

The EarthCo Megablock™ machine is able to convert soils into giant modular building blocks called EarthCo Megablocks™.

This EarthCo Megablock™ measures 18 inches wide by 12 inches tall, is over 14 feet long, and weighs more than 1 ton.

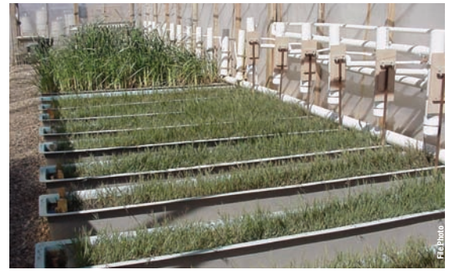
Waste Recycling: Turning Animal and Plant Waste into Fuel

If all of the cattle, swine, and poultry waste across the United States could be collected and converted to electricity, the resulting energy could produce 80 percent of the nation's current electrical power needs, while also generating marketable high-end plants and extracts.

Dr. Clifford Fedler, professor of civil and environmental engineering, believes the country is largely ignoring an unlimited source of renewable energy – animal waste and other biomass – which is nothing more than any dry organic material like yard clippings, paper, residual material from cotton fields or other agricultural leftovers.

By integrating various technologies together, such as water recycling with fish production, not only can additional biomass be generated, but negatively impacted water can be remediated, resulting in a cleaner environment. *E*

Feedlot runoff water could be treated in a series of ponds with aquatic plants such as cattails and water hyacinth.



Treated water can produce other edible plants such as organic tomatoes or other organic food plants.

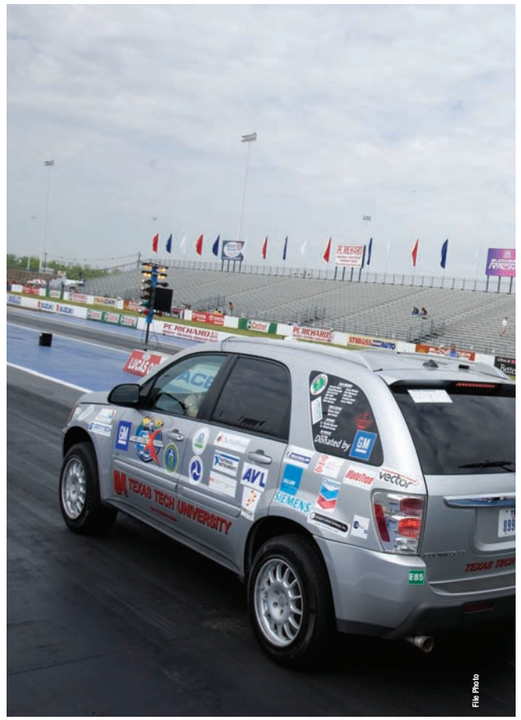
Transportation

EcoCAR: The NeXt Challenge Encourages Green Automobile Design

Texas Tech is now competing in its 21st Department of Energy (DoE)-sponsored event, EcoCAR: The NeXt Challenge. Led by mechanical engineering professor Tim Maxwell, the team most recently competed in the ChallengeX competition. EcoCAR will feature 17 schools from North America.

EcoCAR is a student design challenge supported by the US DoE, General Motors and other sponsors. The competition challenges engineering students to re-engineer a 2009 Saturn VUE, minimizing energy consumption, emissions and greenhouse gases while maintaining the vehicle's utility, safety, and performance.

Students will design, build, and integrate advanced propulsion technologies into their competition vehicles; they are encouraged to explore a variety of solutions including electric, hybrid, plug-in hybrid, and fuel cell powertrains. In addition, they will incorporate lightweight materials, improve aerodynamics. and utilize alternative fuels such as ethanol, biodiesel, and hydrogen. *E*



The 2008 Texas Tech University ChallengeX Team participates in time trials at Raceway Park, in Englishtown, New Jersey.

Seamless Automotive Technology Program Serves Many Student Levels

The Whitacre College of Engineering, South Plains College (SPC), the Lubbock Independent School District and the Lubbock Economic Development Alliance have partnered to develop a unique program called the Seamless Automotive Technology

The program provides students with several exit and reentry points. The high school level of the process provides students the skills and capabilities needed to enter the workforce immediately as certified automotive technicians. Students continuing on to SPC may obtain a one year certificate or an Associate of Applied Science degree in Automotive Service Technology. On completing their work at SPC, students can continue their education by transferring into the mechanical engineering program at Texas Tech. *E*

Ford Motor Company donated a 2006 Ford Escape Hybrid to the Seamless program to assist in the training of students.

Maximizing Future Production in the Oil and Gas Industry

The Bob L. Herd Department of Petroleum Engineering, one of only 16 accredited petroleum engineering programs in the nation, is committed to finding solutions to enhance oil and gas production in geologic formations similar to the Permian Basin. The department focuses on oil and gas extraction through both conventional and unconventional methods.

Drilling technologies are becoming the limiting factor for successful oil and gas recovery as companies tap into more challenging oil fields. Research is being conducted in advanced drilling techniques, cutters, additives, rig design, measurement while drilling methods, and advanced well logging.

Efficient use of existing reservoirs requires knowledge of reservoir type, flow mechanisms and multiphase fluid flow behavior in porous media. The department is studying all aspects of primary and improved oil and gas recovery techniques including modeling and characterization, CO_2-enhanced recovery and sequestration, and improved techniques for production from unconventional reservoirs.

To improve oil and gas production from a reservoir, new understanding of fluid behavior throughout the production stream is essential. Texas Tech researchers are studying formation damage evaluation, fracturing and stimulation, multi-phase flow in pipes with nodal analysis, artificial lift methods, and flow assurance in reservoirs, wellbores, and pipelines.

The department owns a 4000-foot test well within 20 minutes of the campus. This well has, and will continue to play a role in production operation studies for petroleum engineering students. Red Raider #1, the largest test well of its kind on a university property, is a field laboratory for students to examine an on-site pumping unit, explore and test other methods of artificial lift, and study fluid flow.

With vast improvement in computational hardware and software, it has become possible to simulate the behavior of reservoirs, wells, and fluids. Texas Tech researchers are engaged in developing new algorithms and codes to reliably predict these behavior of fluids in a variety of conditions. *E*

Patterson-UTI Rig 2 at Texas Tech's Red Raider #1 Test Well.

News

Computer Science Adds Department Chair, Faculty, and New Research

The Department of Computer Science has recently added new faculty and new research efforts.

Dr. Joseph E. Urban

At the beginning of the 2008-09 academic year, Dr. Joseph E. Urban was hired as the new department chair and professor of computer science. Before coming to Texas Tech, he served as a program director on a two year mobility assignment at the National Science Foundation and as a faculty member at Arizona State University. He has authored more than 100 technical papers and has supervised the development of eight software specification languages.

Joseph Urban's research areas include software engineering, executable specifications, computer languages, data engineering and distributed computing. He earned a Ph.D. from the University of Louisiana at Lafayette, a master's degree from the University of Iowa and a bachelor's degree from the Florida Institute of Technology, all in computer science. He is also the recipient of an ACM Doctoral Forum Award.

Dr. Susan Urban arrived at Texas Tech in early 2008 as a professor of computer science. She has research interests in distributed data management, complex event processing, integration of event and stream processing, distributed rule and transaction processing, and active/reactive behavior in distributed environments. She holds a Ph.D. and master's and bachelor's degrees in computer science from the University of Louisiana at Lafayette.

Dr. Mohan Sridharan was hired last fall as an assistant professor of computer science. He earned a Ph.D. and a master's degree in electrical and computer engineering from The University of Texas at Austin. His research interests include machine learning on mobile robots. He works with the joint Texas Tech and The University of Texas at Austin robot soccer team, which recently won first place in the standard platform league of the US-Open Robot Soccer competitions for 2009.

Dr. Akbar Siami-Namin arrived in January 2009 as an assistant professor of computer science at Abilene. He holds a Ph.D. from the University of Western Ontario. His research interests include software quality assurance and testing; empirical software engineering; and distributed, ubiquitous, and pervasive computing. *E*

Fluor Alumni Event Celebrates Second Year in Sugar Land, Texas

On March 25, alumni and friends of Texas Tech at Fluor Corporation's Sugar Land office gathered to show their Red Raider spirit.

The annual Houston-area alumni event for Fluor employees began last year as a way to establish the Fluor Alumni Scholarship Endowment, a scholarship fund for junior and senior Texas Tech engineering students. Through matching funds provided by Fluor, the scholarship fund grew significantly this year, allowing the opportunity for more students to receive educational support.

Fluor is a strong supporter of the Whitacre College of Engineering through scholarships, events, and student organization sponsorships. *E*

FLUOR®

Fluor Employees and Texas Tech Alumni Tom Zachman, David Goolsby, and Tony Scialo at the Fluor Alumni Event.

The ASCE Steel Bridge Team, with advisors Drs. Audra Morse and Sanjaya Senadheera will compete in the national competition.

ASCE Steel Bridge Team Qualifies for National Competition

The Texas Tech Student Chapter of the American Society of Civil Engineers (ASCE) Steel Bridge Team has qualified for the 2009 National Student Steel Bridge Competition at the University of Nevada, Las Vegas this May. This is the first time that the Texas Tech chapter has qualified for nationals. The team is led by co-captains Allen Johnson and Derek Hammond. The team took third place at the Texas-Mexico Steel Bridge Competition in College Station, Texas in January. The team received a second place award for Construction Speed, a second place award for Stiffness, a third place award for Economy, and the Overall third place award.

Team members include:

Designers	Jake Blessen
	Derek Hammond
	Allen Johnson
Construction Team	Jake Blessen
	Derek Hammond
	Allen Johnson
	Wesley Kumfer
Fabrication Team	Patrick Alfarone
	Jake Blessen
	Jeremy Dixon
	Derek Hammond
	Wesley Kumfer
	Kayla Sisk

E

Howard Swaim, Petroleum Engineering Alumnus, Remembered

Howard W. Swaim was born and attended high school in Wichita Falls, Texas. He received a Bachelor of Science in Petroleum Engineering with a Geology Option at Texas Technological College in 1943.

From 1946 to 1985, Howard Swaim worked for Conoco, Inc. He was known as an industry-wide expert on beam pumping. His authoritative "The Beam Pumping Design Chain" was used as a primary text in many universities. He was promoted to the top of the engineering ladder in 1982 and appointed "Senior Engineering Professional" by Corporate Executive Management of Conoco, Inc. and retained that title until his retirement in 1985.

Howard and his colleague, Fred W. Gipson, presented many technical papers at sessions of the Southwestern Petroleum Short Course. Howard was a member of SPE and was chairman of the Fort Worth Section in 1966-1967. He was conferred with the distinction of "Legion of Honor" Member in 1997. He was chairman of the American Petroleum Institute Division of Production Subcommittee on Programmed Learning and Computer-Based Training Committee. In 1985 he was awarded the J. C. Slonneger Award through the Southwestern Petroleum Short Course. *E*

TEXAS TECH UNIVERSITY
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Engineering *Our* Future

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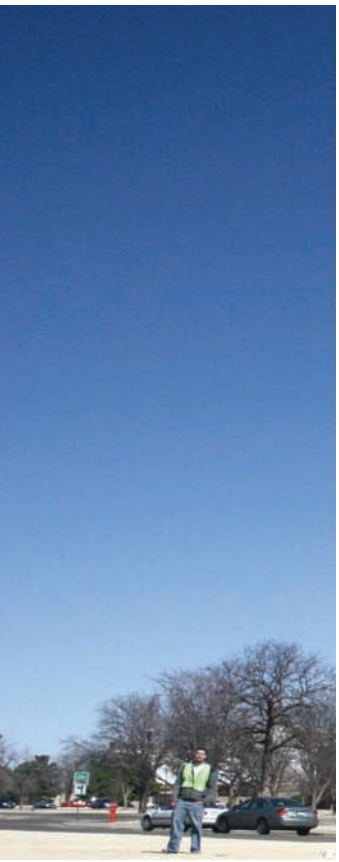

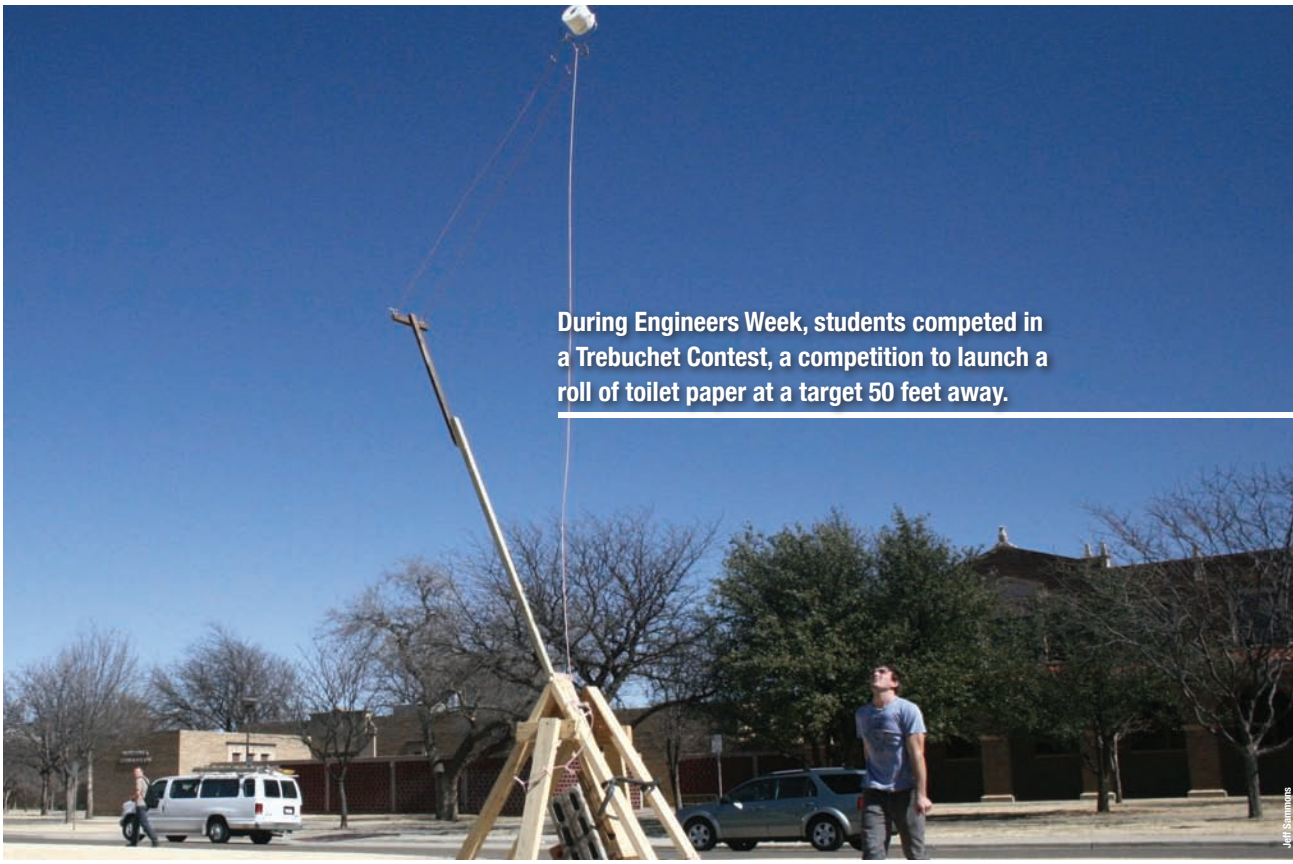

During Engineers Week, students competed in a Trebuchet Contest, a competition to launch a roll of toilet paper at a target 50 feet away.

Jeff Sammons

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