

Education-Centered Wind Energy for the Border Colonias



The Texas Center for Applied Technology (TCAT) partnered with West Texas A&M University Alternative Energy Institute (WTAMU AEI), Texas State Energy Conservation Office (SECO), and the Texas A&M University College of Architecture Center for Housing and Urban Development (CHUD), to give students an engineering program experience with the hopes of motivating them to pursue science and engineering as a career choice. The project provided an introduction to engineering design and project management while demonstrating the feasibility of installation and operation of low-power wind technology in the Texas/Mexico border area. Over 30 students and five faculty members were involved; of those, 12 of 17 graduates (70%) have chosen to pursue scientific or technical degrees in college. The participating schools were the United Independent School District (ISD) High School Engineering and Technology Magnet (UISD), and Laredo ISD Sabas-Perez Magnet for Engineering and Technology (LISD), Laredo, Texas.

Four wind turbines were built, tested, and installed; two were installed at Cigarroa High School where one of the engineering magnets is located, and the other two are located on Webb County property in the colonia areas. The students built the wind turbines from existing plans and generated a set of instructions that will be translated into Spanish to be understandable by colonia residents. The students worked together to make an instructional video that breaks down each step in easy-to-understand terminology and simple tasks to teach colonia residents how to build their own energy maker.

This project is unique in providing high school students, with a predilection towards science and technology degree programs, a real-life engineering project based experience; the team members were subject to cost, schedule, performance, and risk based constraints that most undergraduate engineering students do not ever have until they are employed. By providing this experience, the students can determine if they are suited for a career in science or technology.

This project is being continued in the Texas Rio Grande Valley with the South Texas ISD and the University of Texas Pan-American.

TEXAS CENTER FOR APPLIED TECHNOLOGY

There are many problems that require the careful and proper integration of applied technologies to find solutions. The Texas Center for Applied Technology (TCAT) was created to focus on these specific problems and to develop effective and efficient solutions. TCAT's core competency is the innovative application of existing technologies and advanced research to solve complex real-world problems.

TCAT's primary objective is to apply and test technologies to address targeted problems and engage basic research as required. TCAT has employees in a variety of locations with the ability to perform research that cuts across multiple technologies, disciplines, and cultures. The Center's employees are knowledgeable regarding customers' requirements and are ready to respond effectively to provide the best value for the customers' needs including expertise in technology insertion, technology assessments and test and evaluation.

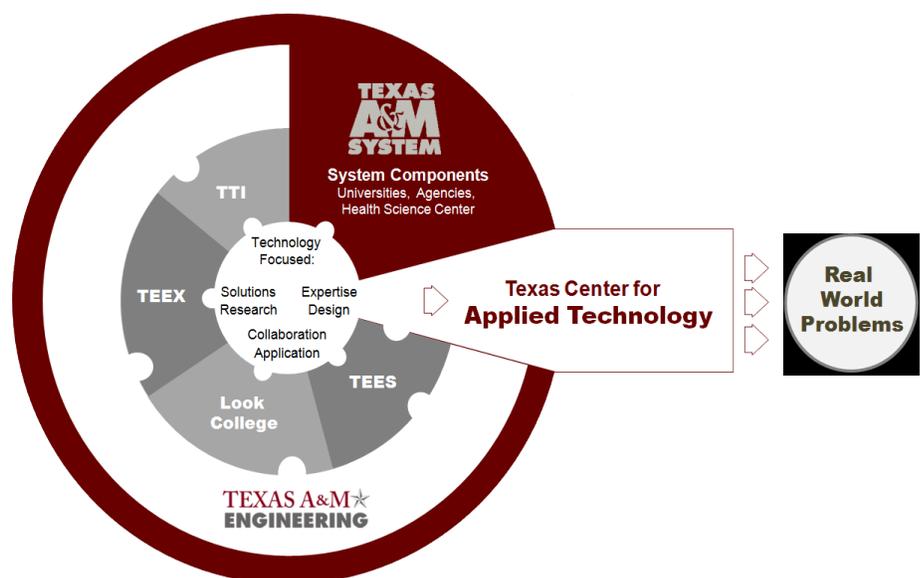
TCAT is part of the Texas Engineering Experiment Station (TEES), a member of The Texas A&M University System. The A&M System is one of the largest and most comprehensive systems of higher education in the United States. Through a statewide network of eleven university campuses, seven state agencies, and a comprehensive health science center, the A&M System educates more than 120,000 students on its university campuses, conducts more than \$772 million in research, and reaches another 22 million people through service each year. TEES is the engineering research agency for the state of Texas and conducts over \$120 million in research annually. Because of the Center's position within the Texas A&M Engineering program, TCAT's expertise can easily be extended by rounding out its team with world class faculty researchers, as appropriate. TCAT is in an excellent position for collaboration not only with The Texas A&M University System components and their customers but with other universities, institutions, centers, and industry.

TCAT'S CORE COMPETENCIES

Aviation & Automotive ★ Energy Sustainability ★ Environmental Sustainability ★ Information Technology
Manufacturing & Systems Engineering ★ Modeling & Simulation
Technology Insertion ★ Test & Evaluation

TEXAS A&M ENGINEERING

Texas A&M Engineering consists of the Dwight Look College of Engineering, and three engineering agencies, including TEES. Texas Transportation Institute (TTI) conducts research and professional education in all modes of transportation. The Texas Engineering Extension Service (TEEX) works to develop a highly skilled and educated workforce and enhances public safety through training, continuing education, and technical assistance.



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