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Research rock stars: Clean transportation star

CSU's Bryan Willson helps take cleantech products to market

By Nora Caley

It's difficult for Bryan Willson to explain what he does.

Willson is a professor of mechanical engineering at Colorado State University. He's the founding director of CSU's Clean Energy Supercluster, a group of 150 faculty members working with clean energy companies to move new products to market. He is also founder and director of CSU's Engines and Energy Conversion Laboratory (EECL), which conducts research on transportation, indoor air quality, distributed energy and other areas.

"It sounds somewhat scattered," Willson says. "What ties it together is we use science to develop solutions to large scale energy problems, and then use entrepreneurial/market approaches to disseminate the results globally on a large scale."

He says some researchers develop a technological solution, write about it in an academic journal, then move on to another project. Instead, the Supercluster and EECL focus on market-driven solutions.

One example is cookstoves. EECL designed clean, efficient cookstoves for people in Asia, Africa and Latin America. "Half the world's population cooks on wood, dung, crop residues, and straw, and the smoke kills 2 million people a year," Willson says. "We develop stoves that burn those fuels much more completely, reduce emissions by 80 percent, and reduce fuel use by half." In 2004, Willson cofounded Envirofit International, which manufactures the stoves.

In 2006, Willson cofounded Solix Biofuels, which makes large-scale algae growth systems. According to the Solix website, biofuels made from algae can help reduce the need for finite, nonrenewable petroleum used in transportation, and thus help solve energy dependence.

Willson received his Ph.D. from the University of Texas at Austin in 1988, the same year he joined the CSU faculty. Although mechanical engineering is usually associated with cars, the department opted to work on underserved areas such as large industrial engines. "It wasn't particularly sexy like cars were, but if we developed something that improves performance, it's easier to move those solutions into production," he says. "That's when your work has impact, when it goes into production."

He founded EECL in 1992 in an abandoned power plant owned by the city of Fort Collins. The EECL expanded its scope to fuels, the smart grid, and other areas. The lab partners with local companies Spirae Inc. to make smart grid solutions, and Woodward Inc. and Dresser-Rand Engineuity to manufacture control systems for large industrial engines. The cookstoves are made overseas, including China, where Willson and CSU are working to build a research institute.

"There is no way to avoid engagement with China in the energy field," Willson says. "You risk being irrelevant if you don't work with China."

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