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Converting Manure To Electricity Wins Intel Award For UNH Team

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DURHAM, N.H. -- Just ask any of the 34 different universities throughout the U.S., Canada, and Mexico who participated in the 17th Annual International Environmental Design Contest (EDC) April 1-4 at New Mexico State University, and they will tell you the University of New Hampshire students are the ones to beat. UNH students not only won first place in their task, they won the prestigious overall Intel Innovation Award.

"I am so proud of the students. This is the third time UNH has brought home the Intel award, which is more than any other school," said faculty advisor Jenna Jambeck, who is research assistant professor in UNH's Environmental Research Group.

Twelve seniors from UNH competed in this year's EDC. Andrew Clements (environmental engineering major), Tiffany D'Amour (business), Lisa Damiano (environmental engineering), Katherine Dietz (business), Shawn Dupont (business), Christopher Getman (business), Steven Granese (civil engineering), Michael Olson (environmental engineering), Jessica Tokson (environmental engineering), Bret Tolivaia (environmental engineering), Eduard Viel (environmental engineering) and Amalia Wosiski-Kuhn (environmental engineering) tackled Task 4: Conversion of Biomass Resource to Useful Forms of Energy and Other Products. This year's design challenges revolved around water, its viability and availability and renewable energy sources.

Sponsored by the Waste Management Education and Research Consortium (WERC), which includes several universities and national laboratories in New Mexico, the annual contest involves tackling real-life problems provided by industry and government. The WERC EDC is the only contest in the world that provides a competitive challenge and means of interaction for university and high school students who are involved in environmental education.

With seven years of participation and two overall wins, the UNH team has a strong history of performing well at this international competition. While focusing on the conservation of energy and natural resources, UNH's WERC team's (MicroCellutions' Inc.) goal was to provide farmers with innovative solutions to waste management for the betterment of the environment and the safety of the farmer.

As a responsible member of the global community, MicroCellutions, Inc. is progressing renewable energy technologies by designing a single-chamber, open-air microbial fuel cell (MOR-2007) that successfully converts cow manure directly into electricity. The MOR-2007 is designed to reduce maintenance, operational difficulty, energy requirements, odors, chemical oxygen demand (COD), and phosphorus, while minimizing the impact of current manure management practices on air and water quality. Residuals from MOR-2007 can be easily composted to provide bedding or land applied to cropland providing essential nutrients for plant uptake. This cyclical approach to nutrient management on the farm minimizes costs for additional fertilizers and bedding materials. MicroCellutions' innovative technology and design, along with their education of farmers about microbial fuel cell (MFC) technology through

public outreach, will provide dairy farmers with an alternative and sustainable manure management system.

Lisa Damiano, UNH environmental engineering senior and honors program student, said, "Participating in an interdisciplinary group with students from business, civil engineering, and environmental engineering was a valuable learning experience. While selecting a project we focused on being innovative. We soon discovered that being innovative was much harder than anticipated because along with learning about it, we had to create our own technology before we could even start to build our project. Although it was a lot of hard work, it was a fun project and well worth it. I'm proud to be apart of it."

Kathy Dietz, UNH business major is also in the honors program. She said, "The experience of working on the business plan for the environmental engineering project and competing in New Mexico was a truly rewarding learning experience. We had the opportunity to work with new and innovative technology and create something that hasn't been done before. Working on a multidisciplinary team of business students and engineering students, we had a chance to gain insight into and overcome real life team obstacles and work together towards creating the best solution not only for the task, but for the environment and the consumer"

The UNH College of Engineering and Physical Sciences integrated several disciplines into this environmental engineering capstone senior design project. Students in the interdisciplinary group represent the following majors at UNH: Environmental Engineering-Municipal Processes, Civil Engineering, and Business-Entrepreneurial Venture Creation (along with Whittemore School of Business Professor Jeff Sohl).

The UNH WERC project was made possible thanks to the efforts of the students themselves, who raised money from outside sponsors to fund their trip to New Mexico. WERC 2006/07 Team (MicroCellutions' Inc.) would like to thank the following financial contributors: John Aber (UNH vice president of research and public service); Appledore Engineering, Inc.; Aries Engineering, Inc.; Stephen Bolander (dean, Whittemore School of Business and Economics); Mr. and Mrs. Larry J. Clements; DeFelice Corporation; Taylor Eighmy; Environmental Compliance Services, Inc.; Environmental Research Group; GeoInsight;, Inc.; Golder Associates, Inc.; N. Granese and Sons, Inc.; Hoyle, Tanner, & Associates, Inc.; Joe Klewicki (dean, College of Engineering and Physical Science); MacGuire Group, Inc.; Malcolm Pirnie, Inc.; E.J. Prescott, Inc.; Ransom Environmental Consultants, Inc.; Resource Laboratories, LLC; Rath, Young, and Pignatelli, PC; Sanborn, Head & Associates, Inc.; Underwood Engineering, Inc.; and Waste Management Weston & Sampson Engineers, Inc.

For more information, contact Jenna Jambeck at 603-862-4023, Jenna.Jambeck@unh.edu or www.werc.net.

High resolution graphics and captions:

<http://www.ceps.unh.edu/images/werc1.JPG>

An Intel judge listening to Andrew Clements' explanation of the UNH project that successfully converts cow manure to electricity.

<http://www.ceps.unh.edu/images/werc2.JPG>

Jessica Tokson, Shawn Dupont and Andrew Clements presenting their project that successfully converts cow manure to electricity to a panel of judges.