



Research Brief#18

1997

Moving Environmental Technologies and Processes from the Lab to the Marketplace

Introduction

While university researchers are extremely busy conducting research, running labs and teaching courses, they are also now often asked to take on the tasks of marketing, selling, and promoting project results. In the environmental marketplace, researchers face the additional obstacle of transferring their technology into a regulatory-driven market that is characterized by risk-averse customers. Because the job of getting federally funded environmental processes or technology from the university laboratory to the industry or government user can be difficult, technology transfer professionals at Georgia Tech have conducted a study to determine the best processes for getting information and technologies to the marketplace.

Researchers Leigh McElvaney and Claudia Huff state that the goal of their study is to “develop a tool to facilitate the technology transfer process and identify the means of compressing the time required to transfer academic findings into viable applications in the field.” To do this, they interviewed researchers who have been successful in their transfer of environmental processes to understand the enablers, barriers, and time frame.

Developing the Study

The study examines the technology transfer process phases, including research and development, business development, and deployment and diffusion. The researchers hope to learn how each phase can be improved to be time- and cost-efficient.

To find appropriate subjects for the study, McElvaney and Huff attended conferences and exhibitions and conducted on-line queries, extensive data-

base searches, and telephone interviews in hopes of finding prime examples of successful environmental technology transfer. Through these inquiries, they became acquainted with High Voltage Environmental Applications (HVEA), a company that markets an electron-beam treatment process used for the destruction of various toxic (regulated) organic chemicals. The research was originally developed by scientists at Florida International University and the University of Miami and funded by the National Science Foundation (NSF). The electron beam process, which involves injecting high energy electrons into aqueous solutions of contaminants, can effectively treat more than fifty organic compounds such as polychloryl ethylene (PCE), trichloryl ethylene (TCE), benzene, and chloroform.

To gain more information about HVEA, McElvaney and Huff met several times with Dr. William Cooper of Florida International University (FIU), a principal investigator (PI) and co-founder of the company, and his co-directors, Drs. Tom Waite and Chuck Kurucz of University of Miami in Florida.

McElvaney and Huff gathered information about many aspects of the HVEA project, including how the technology works, how it was initially conceived, commercialization opportunities, and future plans for the technology.

Conducting the Study

Researchers also conducted in-depth interviews with current and former HVEA employees and co-workers from FIU and University of Miami. Questions included:

- What strategies (approaches,

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Summary of the Problem

Universities recognize technology transfer as vital because of its role in moving research from the laboratory to useful application in the marketplace. But it is also an extremely difficult process. Researchers Leigh McElvaney and Claudia Huff of the Georgia Tech Research Institute conducted a study to find a successful example in which a federally funded environmental process or technology was transferred from a university lab to the field in order to study successful techniques and processes.

After conducting on-line queries, telephone surveys, database searches, and interviews and attending conferences and exhibitions, they focused their study on one candidate—High Voltage Environmental Applications (HVEA), a company that markets an electronic-beam treatment process that was originally developed by scientists at Florida International University and the University of Miami. HVEA founders Dr. William Cooper, Dr. Tom Waite and Dr. Chuck Kurucz are sharing their commercialization experience with McElvaney and Huff and are advising other university researchers who are attempting to commercialize their own research results.

McElvaney and Huff are developing a case study to be used as a learning tool for university researchers interested in the process and practices of technology transfer.

tactics, schemes, methods), if any, were used for calling attention to the practical application of the project's results? What worked/didn't work and why?

- What were the perceived risks at the outset of the effort?
- In applying the project's results, what provisions were made for use of intellectual property?

Study Results

McElvaney and Huff realized that there are some "primary constraints" which may prevent a researcher from successfully transferring an environmental technology. First of all, the regulatory environment is continually changing, so users may be reluctant to invest in a technology that may not be approved, especially if clean-up specifications are changed. Users and regulators of the technology may also be averse to risk, leaving the researcher with a technology that the user is reluctant to invest in.

McElvaney and Huff compiled a list of advice and lessons learned that they gained from other university PIs participating in the study. Some advice involves good business practice, such as "Prepare a sound business plan" or "Have multiple applications for the technology." The National Research Council also notes that multiple applications are beneficial because the environmental market is so fragmented. Expensive technologies need to be flexible and should work with other technologies in order to be cost-effective. Currently the environmental marketplace is characterized by regulatory push rather than market pull to create demand; client and regulatory acceptance is normally slow and cumbersome. Also, due to changing regulations and ongoing negotiations, it's difficult to be flexible and try new options if a technology does not initially work. PIs also advised other university researchers of the pitfalls of the term "innovative technology." On one hand, the word "innovative" will allow researchers to attract funding from federal sources. On the other

hand, it will deter conservative clients because they will perceive the technology as not proven.

Researchers are advised to "be prepared to survive the 'valley of death'—that is, the point in the commercialization/product testing cycle when investment capital is short or lacking and the efforts must be sustained until a new infusion arrives, whether through an investment loan or commercialization." Tenure is another important issue. Typically, researchers are not rewarded in the promotion and tenure process for technology transfer activities. In fact, they may be denied tenure if it appears as if they are not spending enough time on traditional teaching, publishing, and research activities.

Researchers may have a difficult time dividing their time between a university environment and a business one. In one instance, a university professor was denied tenure because it was perceived that he spent too much time on business activities that were not relevant to his university work.

"Some university researchers may be uncomfortable with the culture of a business," states McElvaney. "Promoting research products may bring forth a question of personal ethics for researchers who are unfamiliar with the business aspects of technology transfer and diffusion."

McElvaney and Huff propound the need for a policy which clearly delineates the roles of the university researcher who is also marketing a product, but they also want to ensure that the policy is flexible enough to meet changing needs. They explain that when the intellectual property issues are unclear, researchers understandably become nervous.

"While both the company and university can benefit," Huff states, "Misunderstanding and conflicts can undermine the interests of both."

Future Work

McElvaney and Huff are following up with the HVEA principals as they await news of a possible commercialization success story.



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Project Title: *Case Study Analysis of the Technology Transfer Process for Environmental Technologies and Processes.*