

Waste Diversion Research in Colorado

Background

CU Business Advancement Center initiated a one-year project, funded by the Colorado Commission on Higher Education, Technology Advancement Group, to provide technical assistance to Colorado researchers developing new waste diversion technologies. The objective of the project is to speed the commercialization and/or application of such technologies to address Colorado environmental concerns. This report summarizes information about the types of waste diversion research being conducted in the state based on responses to a mail survey sent to identified researchers.

Methodology

Several methods were used to identify those Colorado business and university researchers involved in waste diversion and pollution prevention research. The most fruitful method was to identify federally funded research using databases and the Internet. This included a review of awards made to Colorado companies by federal agencies including the Environmental Protection Agency and National Science Foundation, as well as awards made by various agencies through the Small Business Innovation Research program. Some researchers were located through a DIALOG database, "Federal Research in Progress." Titles and abstracts were used to sort out research projects appropriate for this study, i.e. those that diverted some contaminant from a waste stream (air, water, soil) or recycled or reused a waste substance.

In addition, researchers at universities were identified by contacting the sponsored research and technology transfer offices at each institution. Research conducted by private sector firms without government funding, was more difficult to locate. An email notice was issued by the Colorado Environmental Business Alliance, offering commercialization assistance to companies doing research in waste diversion areas and announcements were made at several CU-BAC seminars to reach this population.

Profile of Research Population

Using the process above, 76 individual researchers were identified, many with more than one funded research project appropriate to the waste diversion topic. These researchers worked for twenty four different companies and six Colorado institutions of higher education. Of the universities represented, the University of Colorado at Boulder had the most researchers working in this field, followed by Colorado School of Mines, University of Colorado at Denver, Colorado State University, University of Colorado Health Sciences and University of Denver, respectively. Private sector firms with the highest number of researchers identified as working on waste diversion research, were Eltron and ADA Technologies.

The majority of this research takes place in the Denver metro area with 67 researchers identified. Four researchers were located in Ft. Collins and five were located in rural communities.

Descriptive abstracts or titles of the research projects, permitted some classification of the types of environmental media being addressed:

Media	Number of projects	Percentage %
Unclassified	22	29
Water	19	25
Air	14	18
Solid waste	8	11
Biowaste	4	5
Soil	3	4
Hazardous waste	3	4
General Pollution Prevention	3	4
Totals	76	100%

The objectives included monitoring, reuse, recycling, reduction or removal of many different contaminants including mercury, arsenic, metals, chemicals, volatile organic compounds (voc's), toxic organic compounds (toc's), polyvinyl chloride, nitric acid, MTBE, sulfur, ammonia, phosphorous and chromium. Solid wastes to be replaced, reused or recycled include tires, food packaging, paper, and agricultural residues. Research results would apply to mining, industrial production, agriculture, utilities, municipal waste water treatment, airport runways, playgrounds and dental offices.

Survey Results

Each researcher was entered into a database and mailed a letter asking them to register their technology and use the registration form to request project assistance. Follow up phone calls were made by CU-BAC staff to encourage participation. Several companies could no longer be located and many of the researchers were no longer associated with the company or university. Twenty firms completed the registration form (26% of the overall sample).

The majority (13) of those responding represented companies, while seven represented universities. Three of the university researchers listed company partners and two of the businesses listed university partners.

Twelve of the respondents reported research that was applied, while only three were doing basic research, one was in prototype development and one in product design stage. Five technologies were ready to license and two were already in the market.

Research addressed a variety of media: water, solid waste, air, hazardous waste and soil. The technologies applied to industry, mining, agriculture, waste tires, utilities, medical, drinking water, fire fighting, soil contamination, sewage and grass/leaf biowaste.

Forty percent of respondents planned to produce and sell the results of their research. The majority (65%) indicated that more research was required. Other objectives for the technology are shown in the chart below:

Research Objectives			
Objective	University	Company	Total
More research	(6) 85%	(7) 54%	(13) 65%
License the technology	(5) 71%	(7) 54%	(12) 60%
Inform the public or users	(4) 57%	(7) 54%	(11) 55%
Consult to users	(5) 71%	(2) 15%	(7) 35%
Produce & sell	(1) 14%	(7) 54%	(8) 40%

As reflected in the chart, university researchers were somewhat more likely to express a need for more research, and an intent to license the technology. University researchers were also more likely to disseminate the technology through consulting. The university researcher who indicated an intent to commercialize and sell was partnered with a business.

Consistent with these objectives, the most common “next step” in the commercialization process was to secure additional R&D funding, followed by identification of a licensee. Six respondents were looking for business partners and two wanted to find a research partner. Market research and business planning were important to five respondents. Some were focused on product improvement, prototype completion and/or demonstration of commercial viability.

Respondents requested a variety of services offered by the project. Sixteen wanted their technology listed on the Internet and eleven were initially interested in exhibiting their technology at the Waste Diversion Technology Showcase on June 5. When contacted for additional information, however, some withdrew their interest citing intellectual property protection concerns. Ultimately six researchers were selected to make presentations at the forum, with two additional, eight total, technologies represented in the exhibit hall.

Twelve of the twenty respondents were interested in more information about the Colorado Waste Diversion Technology R&D funding. They were notified to check the Internet site as the fund would not have an open solicitation in 2003 due to state budget cuts.

(link) Survey registration form