The GETE Approach to Facilitating the Commercialization and Use of DOE-Developed Environmental Technologies

Authors:

Thomas N. Harvey

Contractor:

Global Environment & Technology Foundation
7010 Little River Turnpike, Suite 300
Annandale, Virginia 22003

Contract Number:

DE-FC21-94MC31179

Conference Title:

Environmental Technology Development Through Industry Partnership

Conference Location:

Morgantown, West Virginia

Conference Dates:

October 3-5, 1995

Conference Sponsor:

U.S. Department of Energy, Office of Environmental Management, Morgantown Energy Technology Center
DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.
DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

This report has been reproduced directly from the best available copy.

Available to DOE and DOE contractors from the Office of Scientific and Technical Information, 175 Oak Ridge Turnpike, Oak Ridge, TN 37831; prices available at (615) 576-8401.

Available to the public from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161; phone orders accepted at (703) 487-4650.
1.11 The GETE Approach to Facilitating the Commercialization and Use of DOE-Developed Environmental Technologies

Thomas N. Harvey (tom.harvey@gnet.org; 703-750-6401)
Global Environment & Technology Foundation
7010 Little River Turnpike, Suite 300
Annandale, VA 22003

Introduction/Needs

The Global Environmental Technology Enterprise (GETE)* was conceived to develop and implement strategies to facilitate the commercialization of innovative, cost-effective Department of Energy (DOE)-developed environmental technologies. These strategies are needed to aid DOE's clean-up mission; to break down barriers to commercialization; and to build partnerships between the federal government and private industry in order to facilitate the development and use of innovative environmental technologies.

Objectives/Problem

DOE's environmental clean-up mission is huge and complex. For forty years, DOE weapons facilities designed, manufactured, and tested nuclear weapons to support the national defense. As was the case with most manufacturers that operated before an understanding of environmental stewardship was developed, this weapons production resulted in soil and groundwater contamination. In 1989, at the close of the Cold War, DOE set a goal of cleaning up its weapons complex to bring all sites into compliance with applicable environmental regulations by the year 2019.

The DOE Office of Environmental Restoration and Waste Management (EM) is responsible for remediating its contaminated sites and managing DOE's waste inventory in a safe and efficient manner. DOE EM faces the challenge of cleaning up more than 100 contaminated installations in 36 states and territories. This includes 3,700 sites, representing over 26,000 acres containing hazardous or radioactive contaminated surface or groundwater, soil, or structures. The cost to remediate these sites, and others which have not yet been formally classified, is not well-defined. DOE estimates have placed the cost at over $200 billion over 30 years. One private study has estimated the cost of remediation at $250 billion.

Many factors will influence the cost of this clean-up. Among these factors is the cost of developing and utilizing remediation technologies. The overall cost could be reduced with the use of more cost-effective technologies, many of which are believed to reside in Department of Energy facilities. However, real and perceived barriers exist which prevent these technologies from being deployed at DOE sites or by other agencies and the private sector. These barriers include: 1.) lack of awareness and

________________________

*The GETE Project is supported by the U.S. Dept. of Energy's Morgantown Energy Technology Center, under cooperative agreement DE-FC21-94MC31179, with the Global Environment & Technology Foundation, 7010 Little River Turnpike, Suite 300, Annandale, VA 22003; phone: 703-750-6401.
access by the private sector to these technologies; 2.) unwillingness to use new technologies due to environmental regulations and enforcement or the perception of those factors; 3.) lack of financing by potential partners which prohibits investments in new environmental technologies; 4.) unfamiliarity with and a lack of consideration in many government facilities of commercialization objectives; and 5.) issues relating to property rights of publicly-developed technologies.

Potential economic value is often defined by the intellectual property rights associated with a particular technology. When these rights are left unprotected or undefined, commercial partners fear that intellectual property rights may be compromised.

### Approach/Solution

The deployment of innovative DOE-EM technologies could provide more cost-effective treatments than remediation technologies and methods currently in use. By building partnerships between the public and private sectors, the technological expertise of federal researchers and engineers and the commercial incentive of industrialists and other non-government interests can combine to help move these technologies "off the shelf" and toward use at contaminated sites.

The GETE approach to achieving this end is: 1.) to develop a process which identifies and assesses DOE-developed technologies from the perspective of commercial marketability; assists in bringing these technologies to the attention of the private sector; and aids, if necessary, in business planning and start-up activities; 2.) to establish a state-of-the-art electronic communications system, the Global Network of Environment & Technology (GNET), to disseminate information on DOE-developed technologies, as well as information on capital and financing availability, regulatory matters, and commercialization objectives to potential business partners and others; and 3.) to undertake public participation and outreach activities designed to address barrier reduction and public acceptance issues.

### Program Description/Technology

1. EM's Office of Technology Development (OTD) supports applied research and demonstration efforts to develop and transfer innovative, cost-effective technologies to its site clean-up and waste management programs. The GETE process seeks, at a minimum, to identify and facilitate the use of those technologies that meet the needs of the OTD Focus Areas and which show the best commercial promise. These Focus Areas are: Contaminant Plume Containment and Remediation; Mixed Waste Characterization; Treatment and Disposal; High-Level Waste Tank Remediation; Landfill Stabilization; and Facility Transitioning, Decommissioning, and Final Disposition.

The GETE technology commercialization process consists of three phases: Technology Identification, in which technologies are identified, screened, and selected; Technology Qualification, in which in-depth assessments of technologies are conducted with regard to technological and commercial potential; and Technology Presentation, in which technologies are "brokered," or matched with public and private partners. This phase also includes business planning, start-up, and financial development assistance.

Technology identification entails meeting and working closely with OTD Focus Area Project Managers, and establishing technology identification criteria specific to the internal success factors of DOE; thus, technology identification is a malleable process which can
vary from one field office to another. Once identification criteria have been established, GETE personnel work with Focus Area personnel to develop an initial list of technologies that appear to be fairly advanced in the DOE development process. This process is made up of stages defined by DOE "Technology Development Gates," which begin with basic research (Gate 0) and extend to production and implementation (Gate 5). In this case, GETE is most interested in technologies which are at Gates 3 through 5: engineering development, demonstration, and production and implementation.

The initial list of technologies is discussed by GETE with Focus Area personnel, and analyzed in accordance with a standardized "Process Acceptance Screening," a list of questions to help quickly assess a technology's potential. This initial screening is general and is aimed at removing from consideration any technology that could be hampered by issues that make successful commercialization unlikely, such as problems with intellectual property rights. Those technologies which show promise are subjected to a more comprehensive screening focused on gathering more information relevant to a technology's commercial potential. Technologies which are not eliminated are passed on to the next phase, technology qualification.

Technology qualification entails a more formal assessment which includes not only a rigorous technical evaluation by an independent third-party evaluator, but also an examination of potential commercial viability, competition, and other such factors in determining if the technology is ready for the marketplace. This step takes between six and ten weeks. When the evaluator believes that they have been able to accomplish the study to a 50 percent completion level, a preliminary report is submitted by the evaluator to GETE. This not only provides a status report on the assessment, but also includes a recommendation on whether to proceed further. If a favorable evaluation is made at the conclusion of the technology assessment, GETE will move forward to prepare a comprehensive market study of the technology to determine the size and scope of its potential market. This market study analyzes potential demand for the technology by DOE and other federal agencies, state and local governments, and commercial and international customers. This step takes two to three months, and facilitates the teaming of the technology with a commercial partner and financing.

The next step is the commercial development phase. In this stage, GETE works to find an appropriate commercial partner for a technology, if one has not already been identified. In many cases, technologies at the later DOE Technology Development Gates have found partners. If a technology has no business partner, GETE can actively seek one through such venues as the Commerce Business Daily or the Global Network of Environment & Technology (GNET, described later in this paper). In all cases, GETE maintains fairness of opportunity through dissemination of information on technologies via the Internet, printed material, and participation in public forums.

The commercial development phase also includes business planning and start-up activities. These can include assistance in the preparation or review of a commercial partner's business plan. Business planning activities must be agreed upon by all concerned, and for that reason, GETE has developed commercial non-disclosure and teaming agreements. Financial development assistance, in which GETE assists in locating and negotiating financial backing, is also provided, if needed.
2. The GETE commercialization process is complemented by the information resources available to the public through GNET. GNET is an Internet-accessible system for sharing and disseminating environmental technology information, and includes features which allow for interaction between users.

GNET has sites on both the World Wide Web (WWW) and The Microsoft Network, and provides timely, easily-accessible information on environmental technologies (DOE and non-DOE-developed), market opportunities, current events, business and financing assistance, and regulatory and legal matters.

One of the goals of GNET is to generate significant private sector interest in the site, in order to provide greater visibility, and to generate interest in innovative environmental technologies, resulting in more technologies being deployed for use. GNET will accomplish this by providing value-added, timely, pertinent information in a convenient, easily-accessible format. This information will range from federal government reports to abstracts of articles published in other sources to databases of technology and program information.

3. GETE outreach activities are designed to assist stakeholders in their efforts to utilize and/or bring to market DOE-developed environmental technologies, and to identify and address existing commercial barriers. These activities include participation in conferences, the production of printed material, and the development of GNET on-line information resources and forums. This activity also includes development of a national affiliates program, and in-depth investigation of strategies to address intellectual property, fairness of opportunity, and conflict of interest issues that arise during the commercialization process.

Accomplishments

GETE accomplishments after one year include:

1. The GETE commercialization process has identified, within DOE OTD Focus Areas, over 185 DOE technologies, and has completed in-depth technical assessments of four technologies. GETE has provided commercial development services to 30 companies. This includes establishing seven teaming agreements, 12 non-disclosure agreements, and three strategic partnerships. General business assistance has been provided to eight companies.

2. GNET is fully operational on the World Wide Web and The Microsoft Network and is continuing to develop a full suite of information resources. GNET was cited by Vice President Al Gore as the network for federal interagency environmental technology collaboration and information-sharing activities. GNET provided an on-line interactive communications service for the White House's Technology for a Sustainable Future Initiative, facilitating development of the national environmental technology strategy, "Bridge to a Sustainable Future." GNET services are also used by the Interagency Environmental Technologies Office, U.S. Environmental Protection Agency Common Sense Initiative, as well as other governmental agencies, non-governmental agencies, and businesses in the environmental technology arena.

3. GETE public outreach activities have included playing a key role in the White House Conference on Environmental Technology, and assisting with 30 local and regional workshops for the White House Technology for a Sustainable Future Initiative. GETE has participated in the White House Sustainable Power Conference, Rocky Flats Environmental
Institute Microbial Purification Conference, Weapons Complex Monitor Applied Research and Technology Colloquium, Sandia National Laboratory Environmental Decision Coalition, and other conferences. GETE utilizes GNET to disseminate information on environmental technologies and government matters of interest. In addition, a GETE Advisory Council, a group of experts who will develop methods to remove barriers to commercialization, has been formed.

Applications/Benefits

The overall benefit of GETE is derived from moving environmental technologies from National Laboratories and into the marketplace by facilitating and accelerating the commercialization process. The increased use of innovative, cost-effective environmental technologies can help reduce the overall cost of remediating contaminated sites.

Future Activities

Planned activities for FY 1996 include: continuing technology identification, qualification, and presentation activities; adapting GNET so that it can begin to generate revenues; and conducting a major technology trade fair to highlight DOE-developed technologies.

Acknowledgments

The GETE project is supported by the Department of Energy-Morgantown Energy Technology Center, under the three-year cooperative agreement DE-F21-94MC31179, commencing October 1, 1994, with the Global Environment & Technology Foundation, 7010 Little River Turnpike, Suite 300, Annandale, VA 22003; phone: 703-750-6401. Subcontracting partners include the Environmental Export Council, National Association of State Development Agencies, National Technology Transfer Center, Professional Services International, Inc., and Science Applications International Corporation. Kelly Pearce of the Environmental & Waste Management Division, Morgantown Energy Technology Center is the Contracting Officer's Representative. GETE would also like to acknowledge the DOE Office of Science and Technology Development at METC and Denise Riggi, Contract Specialist, for continued leadership and support of this effort.


