

Land Transfer and Long-term Management of Contaminated Federal Facilities

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2001

Technology Transfer Roundtable Discussion Group, Session I Summary - December 13

1:00- 3:00 Best Practices in Federal Lab Technology Transfer.

This "roundtable" discussion session highlighted best practices and lessons learned deploying technologies from federal laboratories. Participants included LBNL, LLNL, EPA, ACET Incubator, and Cal Poly Pomona NASA Incubator. This session concluded with recommendations on solutions and next steps for DOE technology transfer initiatives.

Moderator: **Sarah Diefendorf**, Executive Director of Region IX Environmental Finance Center (EFC9), Affiliated with the California State University, Hayward.

Part 1. Brief presentations on lessons learned/best practices on federal lab technology transfer. 5-7 minutes each.

Presentations focused on "lessons learned & best practices" and discussed why some technologies are successfully deployed and others not.

Formal presentations:

- **Sam Doctors**, CEO, ACET & Prof. of Business Administration, CSUH: "Incubator Model for Technology Transfer."
- **Cheryl Frigidakis**, Lawrence Berkeley National Lab, Head of Technology Transfer Office.
- **Laura Santos**, Sandia National Lab, Business Development.
- **Kathy Kaufman**, Lawrence Livermore National Lab, Industrial Partnerships & Commercialization.
- **Dorothy Bishop**, Associate Division Leader, Lawrence Livermore National Lab, Environmental Restoration Division.

Part 2. Discussion group on "solutions/best practices" and NEXT STEPS for improving federal laboratory technology transfer and ways we can work together.

Participants shared best practices from their experience and offered next steps in an informal discussion format.

Participants (including above presenters):

- **Mike Gill**, EPA Region 9, Superfund technical liaison.
- **Jan Baxter**, EPA, Region 9 Science Advisor.
- **John Lee**, Deputy Director, DOE Oakland.
- **Alexander Glass**, Executive Director of the Bay Area Regional Technology Alliance, and former Associate Director of Lawrence Livermore National Laboratory.
- **Julie Holland**, Director of NASA Commercialization Center, incubator at Cal Poly Pomona.

Conclusion: Concluded Session with "solutions" and possible "next steps" for ACET, DOE Oakland, EPA and federal labs to work together on technology transfer projects. Detailed session notes are included below.

SESSION NOTES

Best Practices/Barriers.

1. Lack of Effective Incentives for Technology Transfer.

The majority of panelists voiced the thought that there was a continuing "lack of incentives" for both the technology developer/laboratory and the recipient federal cleanup site. This lack of incentives acted as an important barrier to successful deployment of innovative technologies within the government arena. If the federal government and DOE headquarters are serious about their commitment to deploying innovative environmental technologies to federal sites and private companies, ***"...an overhaul of the current incentive structure will be required. The status quo is not working."***

Developer Side:

- Federal laboratories need better incentives to reward successful technology transfer results, particularly in terms of bonuses/promotions for the PI. Moreover, ***"PIs need a way to charge their labor time to technology transfer projects."*** Currently, PIs are expected to work on technology deployment in their "spare time." (Kathy Kaufman, LLNL). As a result, federal laboratories do not prioritize technology deployment and continue to lack the time and budget to work with private companies or other federal sites on such deployment.
- ***Successful technology transfer requires a team of players that includes a scientist/inventor that is motivated to collaborate on commercializing his technology throughout the entire process.*** Technologies cannot be successfully commercialized without the original inventor's involvement. Funding for technology transfer should also target the scientist's time and expenses on working with private companies or federal sites to facilitate deployment of their innovation. (Julie Holland, NASA Commercialization Center).

Recipient Side:

- At the same time, on the recipient side of technology deployment, the agencies responsible for cleanup at federal sites need to create better incentives to encourage the use of new technologies. (Alex Glass, Bay Area Regional Technology Alliance).
- For example, agencies need to create incentives such as cost savings in the contract system to promote the use of innovative and cost-effective technologies. (Dorothy Bishop, LLNL).
- The environmental problem holders are the federal government agencies. Federal cleanup sites should set aside budget and priorities for using the new technologies developed at our federal laboratories. (Cheryl Frigidakis, LBNL).

- **Another critical element in the transfer process is often that of a third party “agent” or “broker” who can act to bring the transferor and transferee together and to keep tabs on the progress of the transfer process, intervening and encouraging the process as needed.** (Sam Doctors, ACET)
- **Barriers: DOE sites seem to prefer private companies as technology suppliers over their counterpart DOE sites.** For example, some DOE cleanup sites consider other counterpart sites to be less responsive, more expensive and slower than private contractors. DOE should consider appropriate incentives to encourage adoption of other DOE site technologies, e.g. make it more cost-effective through financial support for DOE sites to work with each other. (Sam Doctors, ACET)
- Another strategy might be to first transfer the given technology to a private sector company and then back to the recipient laboratory or site. Sometimes the shortest distance between two points requires a more circuitous route. This is also where third party “agents” or “brokers” can be very useful. (Sam Doctors, ACET Incubator presentation.)
- **Barriers: At the project manager level, there is no incentive to adopt innovative technologies.** Most project managers at federal cleanup sites are risk-averse and are more concerned about failure than taking a risk on a new area of technology. (Mike Gill, EPA Region 9).
- **Barrier: There is little funding support for demonstration of new technologies.** Federal government financial support for demonstration projects at sites would promote site adoption of innovative technologies at the project manager level. (Mike Gill, EPA region 9 and others).

2. Who Is the Customer? Understanding the Market for Environmental Technologies.

Panelists also felt another technology transfer obstacle is the challenge of identifying and reaching "the markets" of laboratory environmental technologies.

- For example, we need to better understand our markets. Who is the customer for laboratory environmental technologies? (Mike Gill, EPA 9). We need to better target marketing toward the right customer or ultimate decision-maker. Is it the project manager at the site? The private contractor manager who evaluates new technologies? Most panelists agreed venture capital and private industry may not be the most likely first customer of laboratory environmental technologies. The federal government, related private sector contractors, and responsible parties at contaminated sites are the most probable market(s) for deploying these new technologies.
- At the same time, project managers at EPA Superfund sites do not always understand the new technologies. This lack of technical understanding serves as a barrier to technology deployment. Technology developers need to be educators as well as marketers. (Jan Baxter, EPA 9).
- *There must be a technical “impedance” match between the transferor and the transferee, i. e. the relative technical sophistication of the parties must be similar or transfer is unlikely to occur.* This impedance match cannot be stressed enough. It is the major barrier to successful technology transfer. (Sam Doctors, ACET)

- Marketing federal lab technologies needs to be similar to entrepreneurial initiatives to market and commercialize innovative technologies. Entrepreneurs attempt to understand and research their market/customers first before trying to commercialize a research technology. Federal laboratories always approach technology transfer from a "technology push" perspective rather than listening to market demand and focusing on "technology pull" from the markets/customers themselves. (Alex Glass, Bay Area Regional Technology Alliance).
- ***Innovative Partnership Models:*** Sandia and LLNL have been developing innovative partnership models with industry as a way to enhance market interaction in the commercialization process. For example, Sandia's partnership model has been effective at improving technology transfer outcomes. Sandia takes an equity stake in some of its spin-offs or licensing partnerships. However, forging successful partnerships requires certain success factors such as natural synergies between partners. At the same time, partners must have adequate funding and technical expertise to support commercialization. (Laura Santos, Sandia and Kathy Kaufman, LLNL).

3. What Is the Stuff and Where is it? Identifying and Selling Laboratory Technologies to Users.

Panelists felt that customers have difficulties even finding and sifting through the plethora of technologies at federal laboratories. At the same time, "selling" unproven technologies would be better facilitated by third party verifications/validations (and brokering) of the technology to reduce risk and increase information to the ultimate customer.

- ***Barrier: What is the stuff and where is it?*** One of the main hurdles for customers or potential users of federal laboratory technologies is identifying and finding the appropriate technologies. Federal laboratories offer a wealth of innovative technologies and solutions but external users face difficulties identifying some of these potential solutions. Lists on Web sites are not enough, "real life" technical evaluation teams used at the NASA Commercialization Center are a more effective way of sifting through the technologies. (Julie Holland, NASA Commercialization Center).
- Publications, web sites, 'tech briefs', etc. only provide the first step in the transfer process, that initial awareness. Many other steps must be undertaken before a new technology will be adopted by an individual or an organization. (Sam Doctors, ACET)
- ***ACET Entrepreneur Model:*** The ACET incubator has also developed a technique for transfer that employs a technical entrepreneur review panel to evaluate LBNL technologies and select technologies with the most likely commercial potential. The entrepreneurs, often Ph.D.'s, with substantial work experience have technical research expertise as well as marketing/commercialization know-how and industry contacts for potential technology deployment. (Sam Doctors, ACET Incubator).
- ***Consumer Reports and Third Party Verification:*** Most customers are unwilling to adopt a risky new technology without substantial information and proven demonstrations or other validations of the technology. There are currently no "Consumer Reports" for customers to refer to for comparative technology and cost information. Neutral third party verifications and summaries of demonstration projects by a blue ribbon panel would help disseminate information on the effectiveness of the technology and reduce the risk for technology adopters. (Kathy Kaufman, LLNL).

- ***SITE Verification Program:*** EPA and ITRC currently offer third party verification of innovative environmental technologies. Our reports help small businesses market new technologies. DOE could collaborate with us and take advantage of this program more effectively. (Annette Gatchett, U.S. EPA, audience response).
- ***Clearinghouse/Ombudsmen:*** There needs to be a single point of contact for all federal agencies and laboratories on innovative environmental technologies. This would help customers find and identify some of our technologies. (Julie Holland, NASA Commercialization Center). Although the Federal Lab Consortium exists for this purpose to some extent, more needs to be done on collecting and disseminating technology information to the right customers.

4. Lack of Communication and Cooperation.

Another common theme among panelists is the general lack of communication and cooperation within DOE itself and among other federal agencies/sites. DOE sites or federal agencies may hold the solution to another federal site's problem but panelists feel communication barriers prevent awareness of possible solutions across federal agency organizational lines. Although communication forums exist such as the DOE TIE workshops, SITE, or BADCAT, these are not enough and may not be reaching the decision-makers at the project manager level at cleanup sites.

- Successful technology transfer requires increased collaboration across several federal agencies to reduce risk. At the local level, we need to collaborate and bring the key players together, e.g. PIs, customers, regulators, marketers. Financial support will be required to reduce risk and time to market as well as to ensure PI involvement in marketing and deploying their technologies. We need "technology champions" across all agencies and laboratories to work with private and public collaborators to ensure technology deployment occurs. (John Lee, DOE Oakland).
- As a group in this room and at the local level, we should work together and increase cross-pollination across DOE and EPA. EPA sites could use innovative environmental technologies developed at DOE laboratories and vice versa, technologies deployed at EPA sites could be useful for DOE sites. We need to take the next steps locally to make this happen and "share the wealth." (Mike Gill, EPA Region 9).
- Federal laboratories are interested in working together, for example, Sandia has many innovative environmental technologies that we have brought to this conference to begin a dialogue. (Laura Santos, Sandia).

Next step: John Lee, DOE Oakland and Mike Gill, EPA 9 called for another ***follow-up local meeting*** to focus specifically on sharing innovative environmental technologies, resources and success stories across DOE, EPA, NASA and federal laboratories. Panelists expressed interest in attending a follow-up meeting to begin a dialogue, share technologies locally and begin possible collaborations on technology transfer across each other's sites. Participants could also begin taking advantage of each other's resources such as the EPA SITE verification program on innovative environmental technologies.

KEY RECOMMENDATIONS

In summary, key recommendations that have resulted from this panel include the following:

- Revamp the current incentive structure for both the "developer" laboratory site and the "recipient" cleanup site to encourage technology deployment. The current incentive structure is not effective.
- Developer site: Provide project funding for the PI to specifically "charge" his/her time and work on technology deployment efforts. Link bonuses and promotions to reward PIs for successful technology transfer outcomes.
- Recipient site: Provide federal demonstration funding as a key component of promoting innovative technology deployment at federal cleanup sites. This financial incentive could make adopting DOE site technologies more attractive to the project manager level.
- Encourage third party technical validation programs at the local and federal level of federal laboratory technologies to increase information and marketing to potential users.
- Employ a third party neutral to act as a transfer agent or broker in assisting in the transfer process.
- Insure that there is a clear technical 'impedance' match between the transfer site and the recipient site, i. e., make sure that both sides can understand what is being transferred and how it is to be used.
- Increase communication and collaboration particularly locally in the western region across DOE, EPA, federal laboratories and other players in the technology transfer arena.