Department of the Interior

Plan to Accelerate Technology Transfer and Commercialize Federal Research and Innovation

Introduction

The President issued a memorandum, *Accelerating Technology Transfer and Commercialization of Federal Research in Support of High-Growth Businesses*, on October 28, 2011, that seeks to accelerate technology transfer between Federal research entities and non-federal entities. The Memorandum called for agencies with Federal laboratories to submit, within 180 days, a five year plan, which covers 2013 through 2017, to meet this objective.

This document provides the Department of the Interior's plan required by the Presidential Memorandum.

Background

Within the Department of the Interior, technology transfer includes the range of activities that are designed to disseminate scientific and technical information and knowledge to and from other federal and non-federal entities. It includes and is not limited to publications, exchange of scientific and technical information, protecting and licensing intellectual property rights, and sharing—or otherwise making available—for scientific or technical purposes the expertise and specialized scientific material and resources to which the Department has access. In 2011, U.S. Geological Survey personnel, for example, authored or co-authored over 3,100 reports, books, fact sheets, and other publications, including over 2,000 scientific journal articles. In addition, Interior bureaus were involved in over 350 Cooperative Research and Development Agreements (CRADAs) of various kinds, such as Technical Assistance Agreements, Material Transfer Agreements and Facility Use/Service Agreements, to advance the study of, and solutions to, the nation's natural hazard, natural resource and environmental problems (e.g., earthquakes, oil spills, invasive species and contaminated water).

In general, technology transfer activities within the Department are consistent with its mission. This mission encompasses protecting and managing the Nation's natural resources and cultural heritage; making available scientific and other information about those resources; and honoring trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The Department's bureaus have varying levels of involvement with scientific and technical research and innovation, and technology transfer. Across this spectrum, the Department strives to ensure that its scientists, engineers and other technical personnel advance the state of knowledge related to the resources it manages, and that this information is accessible to resource

managers, private industry, and the general public. Consequently, the vast majority of the Department's technology transfer activities use traditional technology transfer mechanisms such as publications of peer reviewed papers and reports, webpage postings, and giving presentations at meetings and conferences.

Bureaus that are active in research and development, or have research capabilities that complement U.S. commercial interests, may also utilize technology transfer agreements authorized by the Federal Technology Transfer Act of 1986 (FTTA), as amended, to join forces with non-federal partners. Such agreements allow the Department's bureaus and private sector industries, for instance, to pool their expertise and resources to jointly create and advance technologies that would help fulfill agency missions while helping U.S. industries innovate and commercialize technologies that can strengthen our national economy, reduce risks to the public and the environment, and create jobs.

Within Interior, the U.S. Geological Survey, which has a long-standing research enterprise, has had considerable experience using the authorities afforded under the FTTA. For example, it has been engaged since 1992 in a series of CRADAs with the Pacific Gas and Electric Company to help manage future seismic risks to the latter's gas and electric systems, and to maintain acceptable levels of customer service. The Bureau of Reclamation (Reclamation) and the Bureau of Safety and Environmental Enforcement (BSEE) involvement with technology transfer agreements is more recent, but no less significant. Reclamation, for example, has CRADAs related to the development and testing of desalination technologies designed to increase the quality and quantity of water available to the growing economies of the West, while BSEE has CRADAs designed to improve the response to future oil spills from offshore drilling facilities. The National Park Service has begun drafting policies on benefits sharing, which could accelerate technology transfer between it and non-federal entities.[1]

Of the more than 350 active Cooperative Research and Development Agreements (CRADAs) that USGS, Reclamation and BSEE were engaged in FY 2011, 84% were new in that fiscal year, and 93% were non-traditional CRADAs (e.g., Technical Assistance Agreements, Facility Use/Service Agreements). USGS was responsible for the bulk of the increase, following changes in its internal processes which fostered greater awareness of the need for and utility of technology transfer agreements. Similarly, BSEE's total active CRADAs jumped four-fold in 2011, primarily in response to the Deepwater Horizon oil spill in the Gulf of Mexico.

[1] Benefits-sharing occurs when NPS receives monetary or other benefits from a discovery or invention with a commercial application resulting from research originating under an NPS Scientific Research and Collecting Permit, or other permit or authorization. Benefits-sharing is authorized by the National Parks Omnibus Management Act of 1998, and may employ mechanisms authorized by the FTTA.

For Interior to more broadly accelerate technology transfer, it must first develop broad policies and procedures for technology transfer and incorporate them into the Departmental Manual (DM). This effort is underway. The Department is drawing upon the experience, practices and procedures from around the federal government, especially the Agricultural Research Service within the U.S. Department of Agriculture (USDA-ARS). Once the policies are included in the DM, bureaus will develop their own procedures consistent with their level of involvement and expertise related to research and innovation, mission, and availability of resources. To facilitate bureau participation, the Department is also working on identifying best practices related to technology transfer, and strengthening training of R&D personnel to include consideration of technology transfer activities and related ethics and legal issues.

Department of the Interior Plan

Overarching Goal

The primary goal of the Department's Plan in response to the President's Memorandum is to develop Departmental policies and procedures for technology transfer that would apply to all bureaus. It is essential to provide guidance to bureaus as they institutionalize technology transfer and develop their own procedures consistent with bureau-specific authorities, their level of engagement and expertise in research and innovation, mission, and access to resources.

To support this goal, the Department has developed a set of mutually reinforcing objectives, deliverables for each objective and, where relevant, timelines for those deliverables, as described below. They will also help ensure support and cooperation with the entities tasked in the Presidential Memorandum to provide specific deliverables, including the Office of Management and Budget, the Interagency Workgroup on Technology Transfer, Department of Commerce, Federal Chief Information Officer, and the Chief Technology Officer[see Sections 2 (a), 2 (b), 2 (c), and 3 (b) of the Memorandum].

Since bureaus' extramural research budgets do not individually or collectively exceed $100 million annually, none participate in Small Business Innovation Research and Small Business Technology Transfer Programs. The Plan, therefore, is silent on these programs. The Plan has been developed with full recognition of the need to fulfill Interior's mission with available resources.

Objectives, Deliverables, and Timelines

Objective 1: Develop Departmental policies for implementing technology transfer activities authorized by the FTTA, and related legislation.

The Department will develop general policies and update, where appropriate, existing procedures for implementing technology transfer, and related activities, such as benefit-sharing, between DOI bureaus and non-federal entities. These policies will address and encourage various technology transfer mechanisms, including licensing, Cooperative Research and Development Agreements (CRADAs), facility use agreements, enhanced use leasing, and engagement with local and regional partnerships, as appropriate. These policies will also address and encourage the heads of bureaus with federal laboratories to include technology transfer efforts as a responsibility for each laboratory science and engineering professional, as appropriate. The general policy will be adopted and incorporated into the Departmental Manual, which will set the stage for bureaus to establish bureau-specific policies and procedures consistent with their mission, expertise and available resources.

Approach. The Department has established a working group and launched a process to develop a Departmental Manual (DM) chapter that would put in place policies and procedures for implementing technological transfer activities authorized by the FTTA, as amended. This DM chapter would guide bureaus as they develop their own procedures and implement such technology transfer activities within their research and development (R&D) programs. As part of this effort, the working group has reviewed policies and procedures of the USGS and Reclamation as well as other departments with greater experience in technology transfer. These include the USDA's Agriculture Research Service (ARS), various Department of Defense agencies, and the National Institute of Standards and Technology (NIST). The working group also benefits from a funded interagency agreement between the Bureau of Reclamation and ARS's Office of Technology Transfer, under which the latter provides expert advice on a full range of technology transfer matters. In addition, the National Park Service has been drafting benefits-sharing policy and procedures that also address the relationship between benefits sharing and technology transfer resulting from NPS activities. The Benefits-Sharing Final Environmental Impact Statement and the Record of Decision have already been issued.

The working group has also helped identify several potential gaps such as training of scientists, engineers and other technical personnel engaged in research and development on matters related to technology transfer agreements, ethics training and legal resources for preparing and reviewing patents and various types of agreements. There is special concern regarding insufficient familiarity among Interior's R&D personnel about opportunities afforded by the FTTA to engage with non-federal entities, particularly, commercial entities on advancing and transferring technology. Bureau R&D personnel also need guidance on related ethical and legal considerations. Objective 6 addresses the need for adequate training of personnel in technology transfer activities. Objective 2 addresses DOI's planned approach for addressing legal issues related to patents, licenses and other technology transfer agreements.

It is expected that the new Departmental policy will make it easier for bureaus to enter into collaborative agreements with external partners, including regional technology innovation clusters, universities and private entities. Steps in this direction are already being taken. In FY 2011, Reclamation began utilizing partnership intermediaries to facilitate research partnerships with industry via an interagency agreement with USDA-ARS. Reclamation is exploring collaboration with other agencies in using regional innovation clusters or other technology transfer approaches to form research interest groups related to its mission, namely, water and power management.

Deliverables and Timelines. The Departmental Manual chapter on technology transfer is projected to be in place by June 30, 2013. Potential gaps that have been identified also will be addressed in subsequently (see Objectives 2 and 6).

Objective 2: Review and improve procedures and practices for licensing and establishing other technology transfer agreements

The Department will review procedures and practices for licensing and establishing various technology transfer agreements, including CRADAs, facility use agreements, and enhanced use leasing agreements, with the goal of streamlining the process for entering into such agreements and keeping the time required for issuing these instruments to a practicable minimum. The general policy on these instruments will also be adopted as part of the Departmental Manual.

Approach. In conjunction with meeting Objective 1, the working group developing the Departmental Manual chapter on technology transfer is reviewing practices and policies used within the Department to establish various technology transfer agreements. The Department's Solicitor is reviewing licensing policies, procedures and practices with the intention of updating them to conform to current legal requirements. The current set of policies and procedures dates to the early 1980s. The Solicitor has established an internal work group that is undertaking this activity. The new licensing policies and procedures will also be incorporated into the Departmental Manual.

Currently, the DOI Solicitor's Office has limited legal resources to manage patenting and other technology transfer activities. Accordingly, bureaus are devising approaches to address this challenge, such as seeking patent expertise through interagency agreements and the use of templates to gain legal oversight efficiencies. Reclamation, for instance, is using its agreement with USDA-ARS to gain access to patent advisors. The Department is working to identify best practices from around the federal government, develop templates for a wide variety of technology transfer agreements, and make these practices and templates readily accessible to bureaus in order to facilitate such agreements in a timely and efficient manner. This will reduce, but not eliminate, the need for legal oversight of these agreements. It should also accelerate the process of entering into such agreements.

Deliverables. (a) The DM chapter on patents and inventions will be revised, and (b) a readily accessible online repository of (or links to) documents and legal templates for best practices pertaining to licensing and other technology transfer activities will be created.

Timelines. These reviews and resulting changes to the Departmental Manual are projected to be completed by December 31, 2013, as is the development of documents and legal templates for best practices pertaining to licensing and other technology transfer activities.

Objective 3: Develop and submit annual reports on technology transfer.

The Department of the Interior submitted its first consolidated Annual Report on Technology Transfer in August 2012, which provided data on the number of CRADAs and other collaborative R&D relationships, inventions, patent applications, and revenues for USGS, Reclamation and BSEE.[2] Objective 3 is to develop a more complete consolidated annual Departmental report that will track and report data, where available, on technology transfer activities within the bureaus. This will include information on the number of invention disclosures, licenses issued on existing patents, CRADAs, enhanced use leasing agreements, facility use agreements, industry partnerships, new products under development, new products that have been commercialized, spin-off companies, and any other metrics identified by the Department of Commerce and/or Interagency Workgroup on Technology Transfer that may be appropriate for the Department of the Interior.

Approach. In October 2012, the Department will launch a process to involve all bureaus in developing an Annual Report on Technology Transfer that will respond to the requirements outlined in 15 USC 3710 (f).

Deliverables and Timelines. Starting in FY 2013, the Annual Report for each fiscal year will be developed within four months after the end of that fiscal year, and shared with the Office of Management and Budget and the National Institute of Standards and Technology, Department of Commerce. The report will also be made available publically to encourage greater outreach and interest from other federal agencies and non-federal entities in DOI's technology transfer opportunities.

Objective 4: Analyze trends in technology transfer metrics to help improve the effectiveness of technology transfer programs in stimulating innovation.

[2] Department of the Interior, Plan to Accelerate Technology Transfer and Commercialize Federal Research and Innovation, submitted to OMB, April 2012.

The Department will identify and analyze any trends in the metrics reported in the Annual Reports to help identify measures that may improve the effectiveness of technology transfer programs in stimulating innovation.

Approach. The Department will develop sufficient baseline information on various technology transfer metrics that would allow robust analysis of trends or estimates of effectiveness with respect to technology transfer. As noted previously, the jump in technology transfer activities for 2011 resulted from a change in USGS's internal processes and the need to respond to the Deepwater Horizon offshore oil spill. An analysis will be conducted in order to establish a baseline that accounts for one-time events.

Deliverable and Timeline. The first analysis of changes in metrics will be included in the Annual Report for FY 2013, and repeated each subsequent year. These reports are due to OMB in January each year. This analysis will identify reasons for changes, which may suggest modifications in practices and procedures to improve outcomes.

Objective 5: Improve public access to information related to inventions owned by the various bureaus and Interior's other technology transfer activities.

In cooperation with other federal agencies, the Department will make publicly available lists and other information on its inventions and technology transfer activities through appropriate websites. The Department supports the development of a unified ("one-stop") federal website that would serve prospective collaborators who are looking for information on all government-owned intellectual property and technology transfer activities. This would reduce transaction costs for collaborators who may wish to enter into agreements, and thereby accelerate technology transfer. In the meantime, USGS and Reclamation have provided the Federal Laboratory Consortium on Technology Transfer (FLC) with links to their lists of licensable technologies, and Interior will initiate work on developing a single access point for disseminating information on technology transfer activities from its various bureaus.

Approach. Consistent with the requirement in Section 3(b) of the Presidential Memorandum, the Department will partner with the Federal Chief Information Officer and the Assistant to the President and Chief Technology Officer in their development and maintenance of publicly available lists and databases on technology transfer. The Department will help develop and maintain the lists and databases on technology transfer. USGS and Reclamation already make available some information on their technology transfer activities on the web.[3] This includes information on patents held by the bureau, licensing and other technology transfer opportunities. Information on technologies available for licensing from these bureaus can also be accessed

[3] For USGS, see: http://www.usgs.gov/tech-transfer/index.html. For Reclamation, see: http://www.usbr.gov/research/tech-transfer/index.html

directly via the FLC website.[4] NPS provides via the web a primer on NPS benefits sharing as well as guidance on scientific research and collecting in parks and related permitting.[5] This information could also be linked on the FLC website. However, these sites need to be integrated, and linked through, a Departmental website, which would also provide public access to information from other bureaus and link to FLC or other one-stop federal website. Also, as noted, the bureaus will start to put information online as outlined in Objective 2(b) to develop a repository of best practices and other information on technology transfer. It is anticipated that this information will also serve to make non-Interior entities aware of practices, procedures and opportunities associated with the Department's technology transfer activities. The DOI bureaus, where appropriate, may implement outreach programs using innovative communication technologies (e.g. Websites, Web 2.0, Social Media, and Technology Transfer software) to improve public availability of Interior-owned inventions in speeding up technology transfer and commercialization activities.

Deliverables. The Department will develop a unified website that will make information on Interior-owned inventions and intellectual property, and on its technology transfer activities readily available to the public. The Department will contribute to efforts of the Federal Chief Information Officer and the Assistant to the President and Chief Technology Officer to develop and maintain publicly available lists and databases on technology transfer. In the interim, the Department's websites will provide links to and from FLC websites.

Timeline. The Department will develop its unified website by September 30, 2013, and the bureaus will start to put information online to fulfill both this Objective and Objective 2(b). Maintenance is expected to be an on-going exercise.

Objective 6: Training in technology transfer, and evaluation of scientific, technical and engineering personnel engaged in research and development.

The Department will help bureaus train R&D personnel in technology transfer activities, including training on relevant ethics and legal issues. The Department will also encourage bureaus and laboratories to include, where appropriate, technology transfer as a criterion in the evaluation of such personnel.

Approach. The working group charged with meeting Objective 1 has identified the need for training in technology transfer and related ethics and legal issues in order to accelerate technology transfer. Steps are being taken to improve such training. In May 2012, USGS and Reclamation provided a seminar to personnel from other bureaus to familiarize them with

[4] http://www.federallabs.org/available_technologies/

[5] http://nature.nps.gov/benefitssharing/legal.cfm and https://science.nature.nps.gov/research/ac/ResearchIndex.

technology transfer processes and activities in advance of developing bureau specific programs. The USGS has also offered similar training to its research and development personnel. These efforts are expected to continue. Such training will be supplemented through the development of the online repository of documents and legal templates for best practices pertaining to licensing and other technology transfer activities [see Objective 2(b)]. Also, in meeting this Objective, the Department expects to draw upon the expertise, training and other resources made available through the FLC.[6]

With respect to ethics training, the Departmental Ethics Office is an integral part of the group working on Objective 1. The working group is exploring ways of introducing consideration of technology transfer into various ethics and science training modules offered to bureau R&D personnel.

Regarding evaluation of technology transfer efforts within the Department, the policy developed in order to meet Objective 1 will encourage bureaus and laboratories to use technology transfer as a factor in evaluating research and development personnel. Within USGS, such activities are a key part of the rigorous evaluation process that research scientists undergo every four years. Laboratory evaluations are based on mission responsibilities. Other bureaus will be encouraged to consider and adopt this approach, where appropriate. Laboratory evaluation will be based on its effectiveness in meeting mission objectives.

Deliverables and Timelines. Starting in FY 2013, the working group will offer seminars or workshops to train bureau R&D personnel on the breadth of technology transfer activities authorized by the FTTA and other legislation, and how to implement them consistent with the Department's policies included in the DM, and best practices that have been identified. The material generated for these seminars will be included as part of related modules on ethics and scientific training, and will be placed online by September 30, 2013 and updated, as appropriate. This is expected to be an on-going activity in order to update the material as best practices continue to evolve.

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[6] http://www.federallabs.org/meeting/training/.