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# Environmental Technology Advocate Handbook

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# Disclaimer

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# Preface

Over the past several years, EPA has renewed its commitment to finding innovative technology solutions to priority environmental problems and challenges. Starting in 2003, with the Congressional directive to "develop a 'one-stop-shop' office (within the Agency) to coordinate similar programs that foster private and public sector development of new, cost-effective environmental technologies," the Agency has moved aggressively to institute a number of measures to ensure that we can advance environmental protection through innovative technology applications.

One aspect of the "one-stop-shop" was met through the creation of the Environmental Technology Opportunities Portal (ETOP) web site, http://www.epa.gov/etop. This site gives technology vendors and users access to technology support programs across the Agency and provides up-to-date information on funding and other opportunities.

In June 2004, EPA established the Environmental Technology Council (ETC), with membership from across the Agency and States, to coordinate and focus the Agency's technology programs. The ETC created Action Teams to see how they could use technology to solve some of the Agency's most important environmental problems.

In October 2004, EPA asked the National Advisory Council for Environmental Policy and Technology (NACEPT) to investigate two questions: (1) How can EPA better optimize its environmental technology programs to make them more effective? and (2) What other programs should the Agency undertake to achieve this goal?

In May 2006, NACEPT sent to the Administrator the first of two technology reports, *EPA Technology Programs and Intra-Agency Coordination*. In May 2007, NACEPT submitted its second report, *EPA Technology Programs: Engaging the Marketplace*. Copies of these reports are available on ETOP.

In December 2006, the Administrator responded very positively to the first NACEPT report recommendations. The Administrator committed the Agency to implementing a four-part approach, approved by the EPA Science Policy Council, to better institutionalize environmental technology activities into our core operations. The Administrator gave me the responsibility for implementing these commitments.

The Agency now has a great opportunity to systemically and dramatically increase its ability to develop, deploy, and utilize innovative environmental technologies to solve the most important environmental problems. As we begin implementing the Administrator's commitments, we must make Agency management and staff at all levels aware of this opportunity and help them to engage in technology-related activities in productive ways that will provide solutions for improved environmental and economic performance.

I realize that many of you are already "working" these issues. These efforts are opportunities to review what has been successful, determine how our processes could be improved, and showcase our success. Using the ETC Action Team approach, we already have successes in validating the use of a hand-held camera to detect leaks at petroleum refineries and chemical plants and the use of new technologies to reduce pesticide spray drift.

This is a vision we all share; implementing the Administrator's commitments in response to the NACEPT technology report will enable us to make it a reality.

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## I. Purpose of This Handbook

This handbook is intended to assist you in doing your job as a Technology Advocate in your office—whether regional, program, research, or any other EPA office. It was prepared to give you guidance on what you should do and how to do it and to provide you with resources that will increase your effectiveness in doing your job.

The body of this handbook provides an overview. Supporting materials are included in the Appendix.

This handbook is a work in progress with you as a key partner. It will be revised, improved, and expanded as you provide feedback on what you find helpful and what additional information and resources you think should be added. In addition, each of you has unique resources in your office and among your constituencies—e.g., State agency and industry contacts. You also have found useful Web links and other sources of information related to the availability, use, development, evaluation, and utilization of environmental technology. This handbook gives you the opportunity to share and take advantage of one another's unique resources.

As you think of ways that this handbook might be made more useful to you, please let us know. **Provide your feedback and send your additional resource information and materials to Paul Shapiro at shapiro.paul@epa.gov.**

## II. Background on EPA Involvement in Technology

### A. Background on the Technology Initiative

Since EPA's inception, technology has been central to achieving its goals. Every Agency program has a technology dimension and has had huge successes; using technology has been one of EPA's core competencies. With an increasingly global environment, it is essential that we work with newly industrializing countries such as China to develop and utilize the most appropriate environmental technologies.

After more than 30 years of success upon success in applying technology to meet wide-scale environmental and public health needs, we are entering a new era. We are addressing new types of environmental problems by engaging new sets of tools, a new generation of workers who have new sets of skills, new types of voluntary programs, and a renewed emphasis on environmental results.

Our outside advisors and our internal councils have concluded that there are a need and an opportunity for us to more fully and cost-effectively use technology to solve environmental problems. As we implement the Administrator's commitment to upgrade our technology planning and utilization capabilities, we must more fully engage both our managers at every level and outside parties who have a stake in or a resource that affects the selection of problems and of solutions.

The Administrator is asking all Offices, Regions, and Programs to identify their most pressing environmental problems for which new and innovative technology is viewed as critical to achieving success or to providing more cost-effective options. We must do this on a regular basis.

There are many examples of problems that one or more Regions and Program Offices want to address:

- Energy-related issues—e.g., waste-to-energy, using biomass as a fuel, and energy efficiency.
- Structurally embedded pollutants—e.g., lead paint and asbestos abatement.
- Animal and animal waste issues—e.g., CAFOs, agricultural run-off, and prions.
- Ports—e.g., pollution detection, control, and cleanup.
- Aging water and wastewater infrastructure—e.g., technologies to better assess the condition of the infrastructure and meet water quality goals.
- Diesel engines—e.g., retrofit technology, anti-idling alternatives, and cleaner fuels.
- Detection and monitoring techniques—e.g., for biological and chemical agents and for beaches and islands.

- Water quality—e.g., controlling nutrient loadings and achieving nitrogen and phosphorous reductions.

- Groundwater cleanup—e.g., DNAPLs.

The next step in the process is to engage our technology development and deployment capabilities in the Program Offices, the Regional Offices, the Research Office, and with outside parties to work together to identify, demonstrate, and verify the performance of appropriate technologies. We then must aggressively push to get these technologies into use by employing every mechanism we have in our arsenal—e.g., strong communication, incentive programs, award programs, and partnerships with other agencies as well as the venture capital community and finance companies to achieve commercialization and utilization.

## B. Creation of "One-Stop Shop" for Environmental Technology

In 2003 the House Appropriations Conference Report directed EPA to "develop a 'one-stop shop' office to coordinate similar programs which foster private and public sector development of new, cost-effective environmental technologies" and to submit a report to Congress.

In its report to Congress EPA pledged to establish an environmental technology internet portal (see section on ETOP, below) and to create an Environmental Technology Council. The report can be found at: http://www.epa.gov/environmentaltechnology/forum/about/report.html

## C. Creation of Environmental Technology Council

In June 2004 EPA Administrator Michael Leavitt authorized Paul Gilman, then the Agency's Science Advisor (and Assistant Administrator for the Office of Research and Development) "to establish an EPA Environmental Technology Council, which will have as its mission facilitating innovative technology solutions to priority environmental problems and challenges." He continued "Leveraging excellent technology support programs here at EPA, in the states, and elsewhere, the Council will work to match technologies with problems and help prompt implementation by making government a partner in this journey, not a barrier." (see Appendix)

Administrator Leavitt set a goal for the Environmental Technology Council (ETC), working with the Science Policy Council (SPC), to recommend a "top ten" list of technology/problem opportunities that the ETC could begin working on, reporting on a regular basis EPA's progress in addressing them.

The Science Advisor asked program, Regional, and other offices to appoint to the ETC representative who was a manager at the Division Director or Deputy Office Director level. He also gave the ETC ac charter (see Appendix) that said the ETC should create Action Teams to address the "top ten" problems. After an Agency-wide problem selection process, eleven Action Teams were created to address the selected problems (see section on Action Teams, below, and Appendix).

Senior managers at the Deputy Assistant Administrator and Deputy Regional Administrator level were identified as "Champions" for each Action Team.

The charter also said the ETC would be co-chaired by representatives from ORD, a Region, and a Program.

## D. Creation of NACEPT Subcommittee on Environmental Technology

In August 2004 the Science Advisor and the Director of the EPA Office of Cooperative Environmental Management suggested that the Administrator ask the National Advisory Committee on Environmental Policy and Technology (NACEPT) to create a Subcommittee on Environmental Technology. (see Appendix)

The Administrator appointed the members of the Subcommittee, which had its first meeting in November 2004. The Subcommittee was given a charge to see how EPA can better optimize its technology programs to promote research, development, commercialization, and implementation of needed environmental technology (see Appendix).

The Subcommittee has produced two reports. In May 2006 it submitted to Administrator Johnson its first report on *EPA Technology Programs and Intra-Agency Coordination*. In May 2007 it submitted to the Administrator its second report on *EPA Technology Programs: Engaging the Marketplace*. (see Appendix)

## E. EPA's New Technology Infrastructure

In December 2006 the Administrator responded to the recommendations in the first NACEPT Subcommittee report (see Appendix). He committed to creating a new EPA technology infrastructure with four main elements. The Administrator committed to:

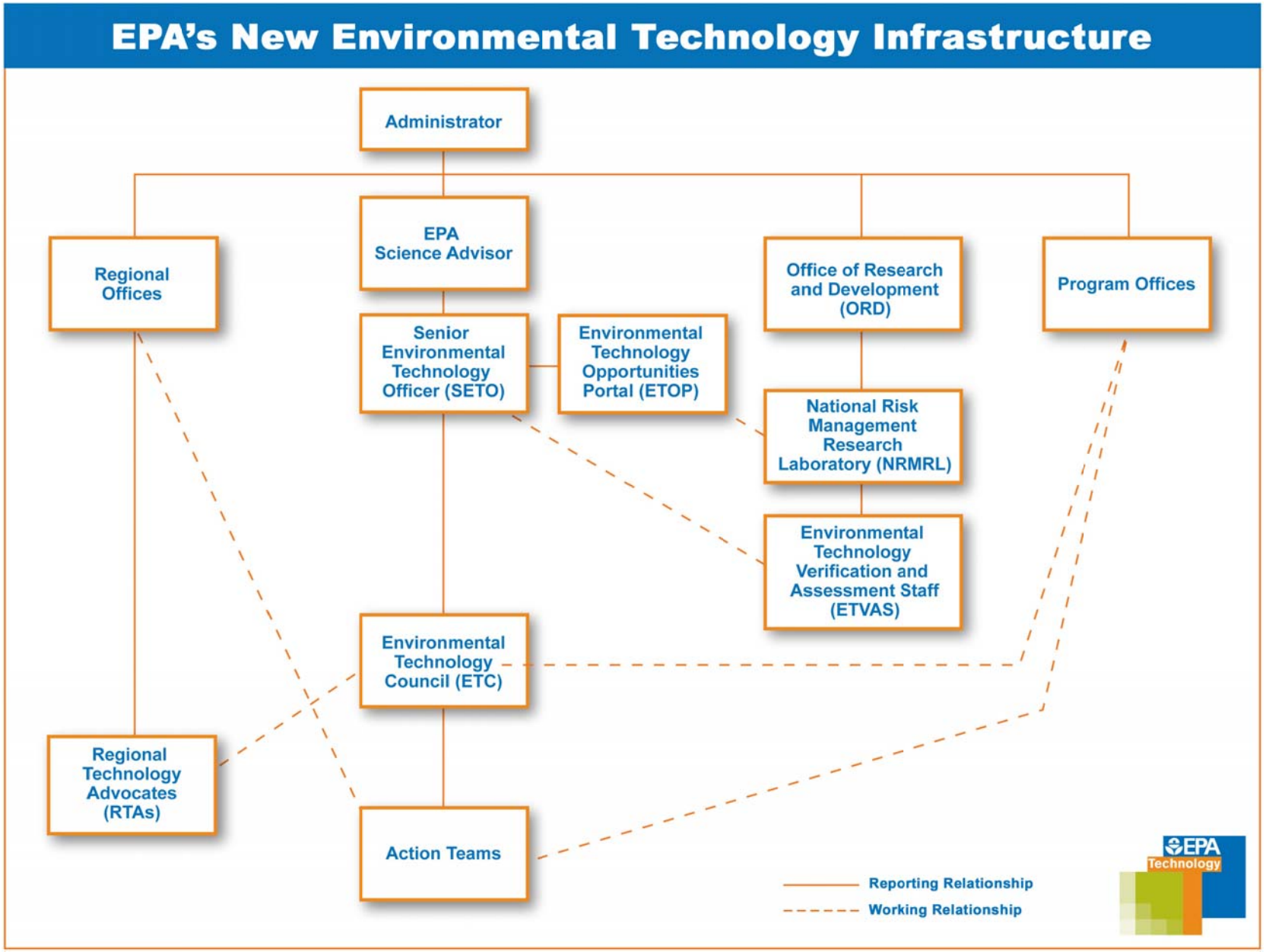
- Establish a Senior Environmental Technology Officer (SETO) who will be the focal point for key activities recommended in the NACEPT report like establishing priorities, chairing the ETC, facilitating cross-agency coordination and information sharing, working with the business community and other stakeholders, and developing metrics for measuring effectiveness. The Position Description for the SETO is given in the Appendix.

- Establish the Environmental Technology Council (ETC) as a core Agency activity with more senior-level membership accountable for results. The original charter for the ETC is included in the Appendix.

- Establish a Regional Environmental Technology Advocacy Network (RETAN) comprised of a technology advocate in each region to identify opportunities to use technology to achieve better results, share information within the Agency and with stakeholders, serve as liaison with technology programs across the Agency, and serve as member of the ETC. The draft Position Description for the Regional Technology Advocates (RTAs) is included in the Appendix.

- Create an Environmental Technology Verification and Assessment Staff (ETVAS) coordinated by the National Risk Management Research Laboratory to provide enhanced technology support to the SETO and the rest of the Agency on issues like technology verifications, state-of-the-art assessments, technology development collaborations, and encouraging sustainability.

  This new technology infrastructure is depicted in the following diagram.


EPA's New Environmental Technology Infrastructure
Administrator
EPA Science Advisor
Regional Offices
Office of Research and Development (ORD)
Program Offices
Senior Environmental Technology Officer (SETO)
Environmental Technology Opportunities Portal (ETOP)
National Risk Management Research Laboratory (NRMRL)
Environmental Technology Verification and Assessment Staff (ETVAS)
Environmental Technology Council (ETC)
Regional Technology Advocates (RTAs)
Action Teams
Reporting Relationship
Working Relationship
EPA Technology

## F. Environmental Technology Advocates

### 1. Role of Environmental Technology Advocates

As an environmental technology advocate, you should plan to perform a variety of functions that include but are not limited to the following. Additional functions for Regional Technology Advocates (RTAs) are included in the Appendix in the draft RTA Position Description.

- Identifying important environmental problems and other opportunities to use environmental technologies to achieve better environmental results;
- Sharing information within the Agency and with outside stakeholders;
- Communicating regularly with your DRA or DAA about technology issues and priorities for environmental problems to address;
- Serving as your office's liaison and point-of-contact with environmental technology programs across the Agency; and
- Serving as a member of the Agency-wide Environmental Technology Council (ETC).

### 2. Tips for Technology Advocates

- Remember that yours is an advocacy position. This means proactively looking for opportunities to bring technology to the attention of people in your office and, when appropriate, outside your office.
- Remember that your job is to promote the use of technology to solve environmental problems; it is not to promote technology for technology's sake.
- Find out what environmental problems are important for your office, rank them in priority using the Environmental Problem Identification Questionnaire, and address all those for which you have the information and resources to do so.
- Create your own network within your office of other staff to whom you can turn for advice and assistance. For RTAs this can include HSTLs, RSLs, Regional Science Council, Regional laboratory, if your Region has one, programmatic managers, and policy and technical experts.
- If you are an RTA, remember that you are part of a Regional Office network—the RETAN—through which you can call on the assistance and advice of other RTAs.
- Remember that you are part of an Agency-wide network—the ETC—through which you can and should raise issues of interest to your office and ask for advice and assistance.

- Build a file of technology contacts outside the Agency to whom you can turn for advice and assistance—other Federal agencies, States, environmental organizations, technology vendors, consulting firms, technology incubators, venture capital companies, etc.

- Create a system within your office so everyone knows that if they are contacted by a technology vendor they should straightaway refer the vendor to you. You should keep a file of all the technology vendors who have contacted you and what you did to assist them.

- Stay in contact with your DRA or DAA—perhaps through periodic meetings—so you are in tune with his or her priorities and technology needs and use those as a guide to where you focus or re-focus your energy.

- Support to your fullest extent the ETC Action Teams by identifying your Office's most important problems, taking a leadership role in creating an Action Team, finding Office staff to co-lead and be members of Action Teams, and seeing if your DRA, DAA, or other Office senior manager will be the Champion for an Action Team.

## 3. Responding to Technology Developers

When an environmental technology developer contacts you, these are some steps you can take to respond:

- Begin by keeping a notebook with the date, name, contact information, and brief notes on your conversation or email. It's useful to refer back to for a number of reasons.

- Inform them that EPA has a national website, ETOP (Environmental Technologies Opportunities Portal), and it contains information for technology developers and technology users. www.epa.gov/etop

  You can also tell them that Region 1 has the Center for Environmental Industry and Technology (CEIT) web site: www.epa.gov/r1/assistance/ceit

- Encourage all environmental and energy technology developers to sign up for **EnvirotechNews**. The information for signing up is located on the home page of ETOP. The following information describes the listserve and can be emailed to interested parties:

  *ETOP's EnvirotechNews is a free monthly electronic newsletter. EnvirotechNews provides technology developers with : 1) the opportunity to connect with potential technology users, and 2) time critical information relevant to the environmental technology industry. The newsletter covers the following topics: Government Funding Opportunities, Technology Opportunities, Environmental Technology Verification (ETV) Opportunities, and Upcoming Events.*

  *The monthly issue which is released at the end of each month covers all the topics except Technology Opportunities which are presented in special issues of EnvirotechNews. This section offers you the unique opportunity to connect with people or companies that may be looking for new solutions to specific environmental problems.*

*To sign up for EnvirotechNews send a blank e-mail message to: envirotechnews-subscribe@lists.epa.gov. The system will then send you a confirmation message and you need to follow the instructions in order to complete the sign up process.*

- If their technology is commercially available then encourage them to list it on Region 1's **Innovative Technology Inventory** or **Virtual Trade Shows.**

- The **Innovative Technology Inventory (ITI)** is a unique web-based inventory of commercially-available innovative environmental technologies on Region 1's site. The application forms can be found at:

- If the technology is a **storm water, decentralized waste water technology, or marina wash water technology**, then the developer should list it in the **Virtual Trade Shows**. The application forms can be found at:

- If the technology is a **hazardous waste treatment or monitoring technology**, then they should talk to EPA's Technology Innovation Program about listing it on www.epareachit.org . (See "Hazardous Waste Cleanup ...")

- Often technology developers are looking for an EPA seal of approval for their technology. The **Environmental Technology Verification (ETV)** verifies technologies; it does not approve or certify them. A list of the current ETV Centers and their contact information is attached**.** For more information refer inquiries to their web site: www.epa.gov/etv

- Several states have programs and services for environmental technology developers. Some of these are offered by the state economic development offices or the state department of environmental protection. A good place to start if you are unfamiliar with state programs in your region is to visit www.winbmdo.com . A nationwide listing of state economic development contacts is available under "State Resources".

- Outside of NE, there is an organization known as TARP ( The Technology Acceptance and Reciprocity Partnership). It includes the following states: California, Illinois, Massachusetts, Maryland, New Jersey, New York, Pennsylvania, Virginia. Pennsylvania maintains the web site and it links to the member states: http://www.dep.state.pa.us/dep/deputate/pollprev/techservices/tarp/

- Several states have non-profit organizations for environmental technology developers and business incubators. These organizations and the state economic development programs often offer general SBIR workshops and in some cases SBIR proposal preparation assistance. The web site for the National Business Incubation Association is: http://www.nbia.org/.

- Most **Venture Capital and Angel Investment Organizations** hold forums or meetings at which the entrepreneurs give presentations on their companies. Clean Tech holds venture capital forums for companies with environmental and energy technologies. They

also offer courses for entrepreneurs on how to secure outside funding, and they work with the entrepreneurs on their presentations.

- Clean Tech Venture Network, contact Keith Rabb, President & CEO , 517-223-9607. Clean Tech usually has 2-3 forums per year. Web site: www.cleantechventure.com.

- Investors' Circle, a network of angel investors which holds meetings across the US. Their focus is on socially responsible businesses - environmental, energy, minority businesses & women owned businesses, contact: 617-566-2600
  E-Mail: inbox@investorscircle.

- **Energy related technologies** - Department of Energy offers several funding programs for technologies which will reduce energy consumption. DOE contact: Scott Hutchins, 617_565_9765.

- **Transportation related technologies -** Department of Transportation has a small SBIR each year, and funding for special projects. DOT contact: Joe Henebury, 617-494-2051(SBIR). For special projects, contact Maggie Theroux and she will approach Joe Henebury.

- **Hazardous Waste Cleanup or Monitoring Technologies** - Please refer these technology developers to EPA's Technology Innovation Program (TIP) which is in the Office of Solid Waste and Emergency Response in DC.

  - The director is Norman Niedergang, 703-603-9910. A listing of the staff members and their areas of expertise can be found at: http://clu_in.org/tiomiss.cfm#staf_dire
    - TIP has several web sites and these three web sites are probably the most relevant: http://clu_in.org/ , http://www.epareachit.org/ http://www.epareachit.org, and www.epa.gov/tio/.

  - "EPA REACH IT is a system that lets environmental professionals use the power of the Internet to search, view, download and print information about innovative remediation and characterization technologies." It is similar to CEIT's ITI.

  - Clu-in provides hazardous waste cleanup information. The site provides a link to their list serve, Techdirect, for sign up.

  - Our Region 1 contact for the Superfund Innovative Technology Evaluation (SITE) Program is John Smaldone, 617-918-1207.

- **Drinking Water Technologies** - CEIT through the NE Interstate Regulatory Cooperation Project has helped to set up the Small Systems Drinking Water Advisory Board. Overtime, the board will review different types of drinking water technologies; currently, they are looking at arsenic removal technologies. Our contact at UNH is Robin Collins, 603-862-1407 or E-Mail: robin.collins@unh.edu . He runs the Water Treatment Technology Assistance Center which is one of eight such centers funded by EPA.

## G. Environmental Technology Council and Its Action Teams

### 1. Environmental Technology Council

In its 2004 Report to Congress entitled "Coordination of Programs Which Foster Public and Private Sector Development of Environmental Technologies," EPA's Office of Research and Development (ORD) committed to creating the Environmental Technology Council (ETC) to "enhance the communication and coordination of all EPA technology activities." A copy of the Report to Congress is available on ETOP at http://www.epa.gov/environmentaltechnology/forum/about/report.html. As defined in its charter, the ETC's primary functions are to:

- Identify priority environmental problems where technology is a critical factor in providing a cost-effective solution;

- Screen the problems using stakeholder input to determine priority for the Council's attention; and

- Set up temporary Action Teams to address problems. Each team will evaluate the status of possible technology solutions and take actions to address the problem.

ETC membership consists of Agency managers and staff from each Headquarters media Program Office, ORD, the Office of Enforcement and Compliance Assurance (OCEM), the Office of Policy, Economics, and Innovation (OPEI), and all 10 Regional Offices.

ETC formally reports to the EPA Science Policy Council (SPC) and consults with the EPA Innovation Action Council (IAC) on its activities. Both the SPC and IAC have similar membership—Deputy Assistant Administrators from Headquarters EPA Program Offices and Deputy Regional Administrators from the 10 EPA Regional Offices. Currently, the ETC is co-chaired by:

- Sally Gutierrez, Director, National Risk Management Research Laboratory, ORD;

- Walt Kovalick, Director and Assistant Regional Administrator for Resources Management, Region 5; and

- Maggie Theroux, Director, Center for Environmental Industry and Technology, EPA Region 1.

Administrator Johnson committed in his December 19, 2006, letter to the NACEPT to establish the ETC as a core Agency activity with more senior-level membership accountable for results.

### 2. Action Teams

In 2004, the ETC conducted its first prioritization process for environmental problems. Administrator Leavitt directed that the ETC identify the 10 most important problems for which technology could be a solution and create action teams to help solve them. Through an Agency-

wide ranking process, eleven problems were identified and action teams created. Each Action Team created Action Plan and has worked to implement that plan.

The six criteria used for the first ETC environmental problem identification survey included:

- Risk/impact on sensitive populations
- Link to regulatory requirements
- Potential for success given the technology status/problem complexity
- Link to Government Performance and Results Act (GPRA) Goals
- Potential cost reduction
- Multimedia impacts

Following this initial prioritization process, 11 priority problems were identified and the ETC representatives from the Regional and Program Offices and ORD were asked to identify which of the 11 problems they would be willing to address. For each of these problems, ETC Action Teams were created to investigate the potential for technological solutions to them.

The Action Teams that were created, with their co-leads, were as follow. A brief description of their work can be found in the Appendix. More extensive information can be found on the ETOP web site at: http://www.epa.gov/etop/forum/problem.html.

1. **Remote Sensing of Pollutants -** Team Leaders: Barry Feldman, Region 6, and Ken Gigliello, OECA/OC

2. **Recovering the Value of Waste for Environmental and Energy Sustainability -** Team Leaders: Donna Perla, ORD, and Larry Gonzalez, OSW

3. **Concentrated Animal Feeding Operations (CAFO) Pollution Prevention -** Team Leader: Sean Bergin, Region 7

4. **Arsenic Maximum Contaminant Level (MCL) Compliance for Small Drinking Water Systems -** Team Leaders: Tom Huetteman and Bruce Macler, Region 9; and Eric Burneson, OW

5. **Technologies Promoting the Sustainable Use of Contaminated Sediments and the Beneficial Reuse of Waste-Related Materials -** Team Leader: Eric Stern, Region 2

6. **Lead Paint Remediation in Dwellings -** Team Leader: Maggie Theroux, Region 1

7. **Continuous Fine Particulate Monitoring -** Team Leader: Michael Compher, Region 5

8. **Coal Gasification -** Team Leaders: Robert Wayland and Lorie Schmidt, OAR

9. **Improved Pesticide Application Equipment to Reduce Spray Drift -** Team Leaders: Jay Ellenberger and Norman Birchfield, OPPTS, and Gregory Sayles, ORD

**10. Rapid Detection of Microbial Contamination of Water: Application of Molecular Technologies to Source and Potable Water Monitoring -** Team Leader: Keya Sen, OW

**11. Urban Runoff -** Team Leader: Charles App, Region 3

Each Action Team created an Action Plan and has worked to implement that plan. A summary of each Action Team's work is given in the Appendix. A number of the Action Teams successfully competed for internal ORD Environmental Technology Verification (ETV) Program grants to conduct verifications related to the work of their team. These projects are described on the ETV web site: http://www.epa.gov/etv/este.html.

During the past two years, EPA has expanded its efforts to more effectively identify priority environmental problems. These efforts include the Administrator's Action Plan, the Deputy Administrator's Regional Priorities, National Program and Regional issues identified in the *2006-2011 EPA Strategic Plan,* and the Annual Program Guidance.

To ensure that all of these priorities are considered in any new ETC problem evaluations, an ETC Environmental Problem Identification Questionnaire has been created (see Appendix). Within the questionnaire, a two-level screening approach is used. Screening level one focuses on environmental problem definition and how this problem fits among the top priorities across the Agency. Screening level two focuses on problem- and technology-specific issues, as well as key stakeholder positions about the problem.

## H. EPA Technology Development Continuum

The EPA Technology Development Continuum, which is shown below, arrays EPA programs that support environmental technology according to the stage(s) it supports during development and deployment of these technologies. The Continuum shows the sequential stages of technology development and the flexible nature of EPA programs to support single or multiple stages.

It should be noted that EPA programs are only applicable in five of six Continuum stages—technology commercialization is not supported by the Agency. Addressing this significant gap in the process of getting innovative environmental technologies into utilization is an important impetus for creating and supporting technology advocates in EPA.

The Continuum provides a strong conceptual tool that can enable coordination and collaboration among the Agency's technology programs. It also permits management to consider the number of programs and the relative funding that the Agency is devoting to various stages along the Continuum.

A full description of the Continuum and each of the 24 EPA technology programs is available in Appendix D of the NACEPT report, *EPA Technology Programs and Intra-Agency Coordination,* May 2006. See http://www.epa.gov/etop/nacept for a copy of the NACEPT Report.

There is a primary and secondary focus for most EPA programs; the color shading for each of these programs depicts this emphasis. For example, an EPA program that provides financial support for technology R&D, such as the Small Business Innovation Research (SBIR) program, has a primary emphasis in the first two Continuum stages and a secondary emphasis in the remaining three stages.

An EPA demonstration/verification program, like the Environmental Technology Verification (ETV) program, has a primary emphasis at the verification stage and a secondary emphasis at the diffusion/utilization stage. Alternatively, an EPA in-kind support program, such as Cooperative Research and Development Agreements (CRADAs) available under the Federal Technology Transfer Act (FTTA), can be employed at any Continuum stage. An interactive method for technology developers or users to review the Continuum is also available on ETOP (http://www.epa.gov/etop).

Some EPA programs also offer the potential to work collaboratively or in tandem. For example, EPA offers joint SBIR and ETV Regional workshops and offers an option to SBIR Phase II recipients to receive additional EPA funding to support the cost of technology performance verification through the ETV program.

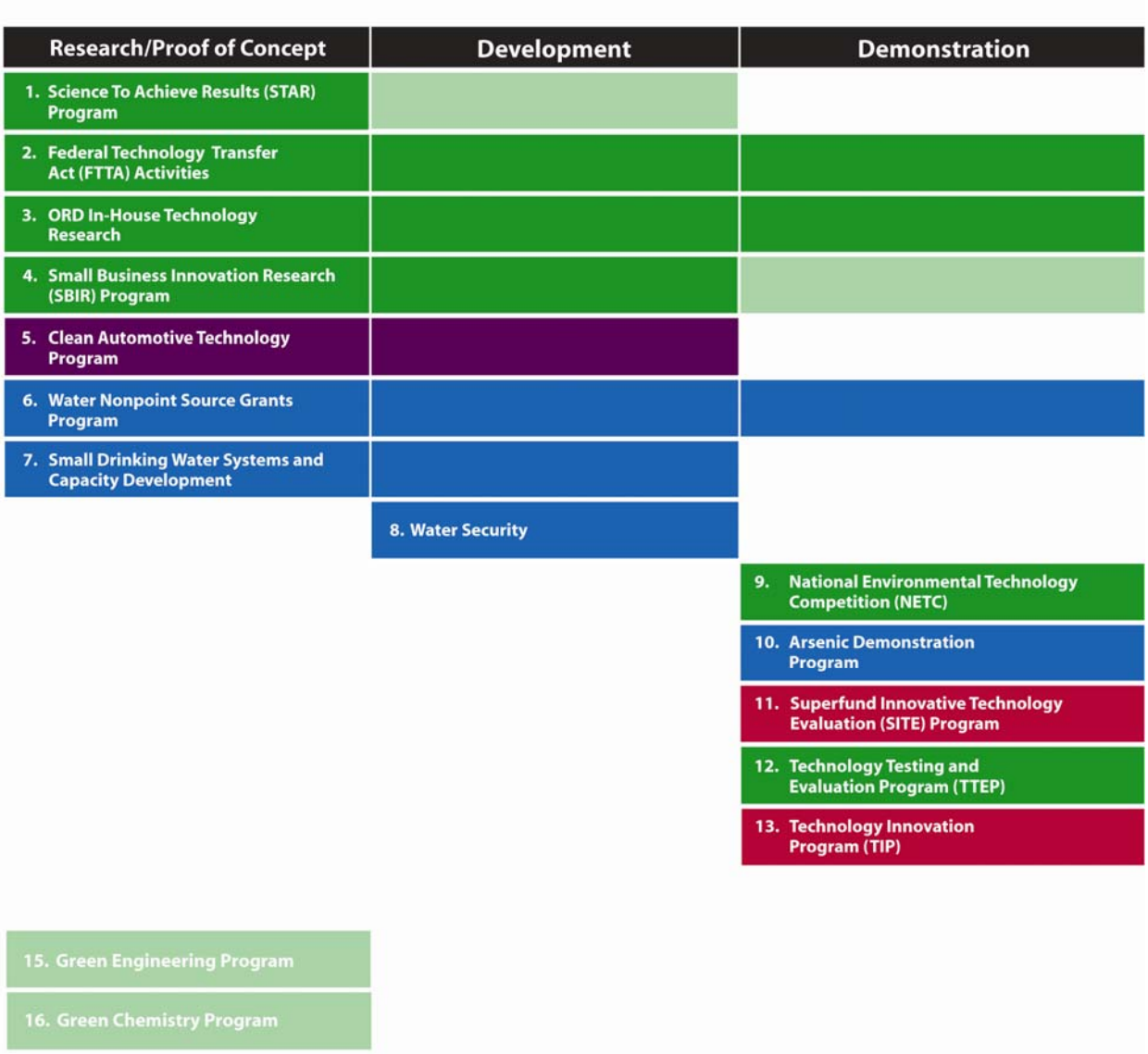
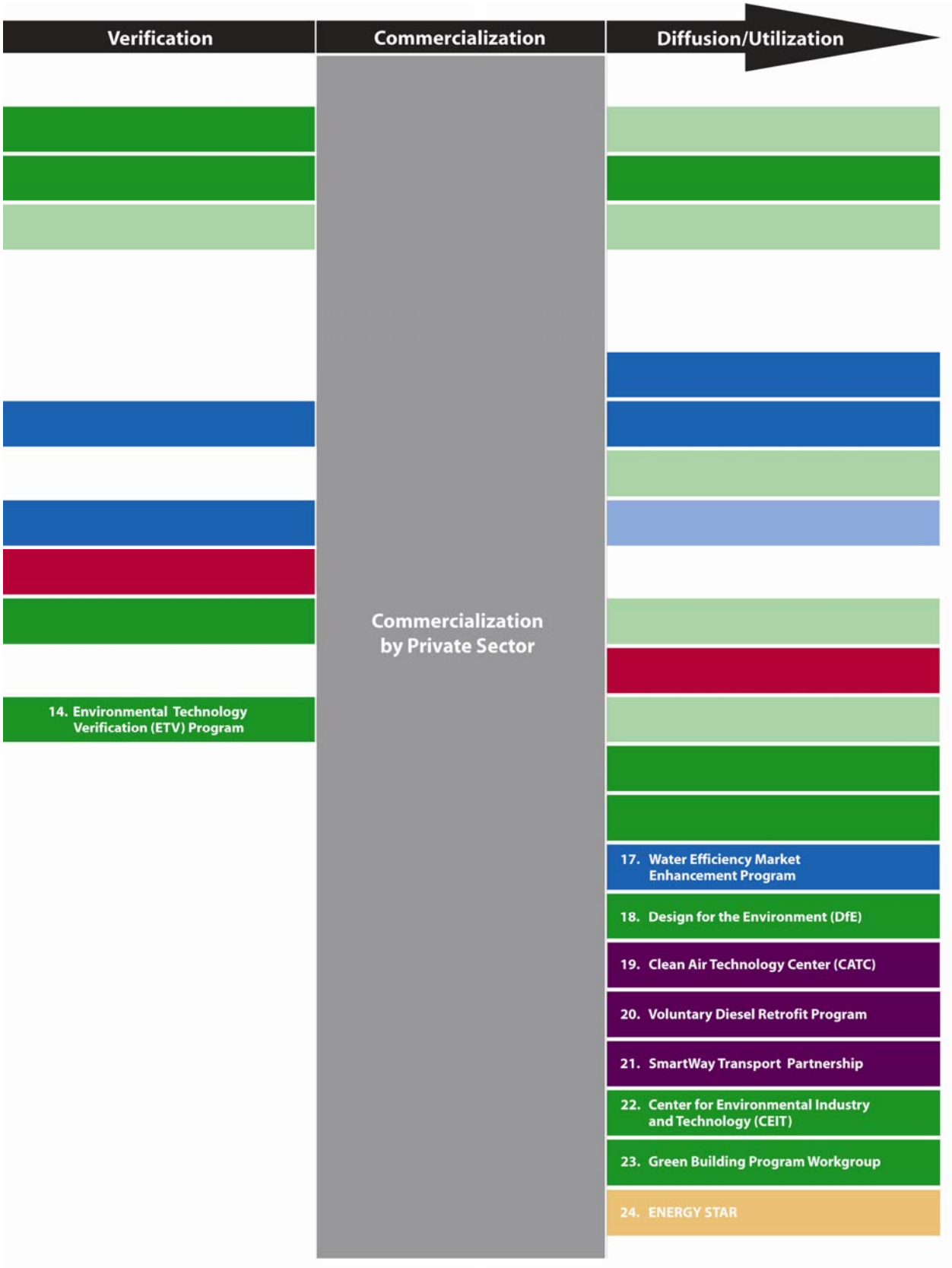



**Figure 1. EPA's Environmental Technology Development Continuum**

Note: Lighter shades of color indicate a minor or secondary emphasis for the listed program.

■ = All Media Technologies
■ = Water Technologies
■ = Air Technologies
■ = Hazardous Waste Technologies
■ = Energy Conservation

Continued on next page


Verification
Commercialization
Diffusion/Utilization
Commercialization by Private Sector
14. Environmental Technology Verification (ETV) Program
17. Water Efficiency Market Enhancement Program
18. Design for the Environment (DfE)
19. Clean Air Technology Center (CATC)
20. Voluntary Diesel Retrofit Program
21. SmartWay Transport Partnership
22. Center for Environmental Industry and Technology (CEIT)
23. Green Building Program Workgroup
24. ENERGY STAR

## I. Environmental Technology Opportunities Portal
## ***http://www.epa.gov/etop***

In its 2004 Report to Congress entitled "Coordination of Programs Which Foster Public and Private Sector Development of Environmental Technologies," ORD committed to establishing an environmental technology Internet portal—the Environmental Technology Opportunities Portal (ETOP). A copy of the Report to Congress is available on ETOP (http://www.epa.gov/environmentaltechnology/forum/about/report.html).

ETOP was created in December 2003. The portal was designed to make "technology" more visible on the EPA and ORD home pages and offer a complete guide to technology programs and information available throughout EPA, as well as resources of other federal agencies.

The ETOP web site is being re-designed, so your input now in terms of how it could be most useful to you will be most helpful. You should direct questions about ETOP and suggestions for its improvement to Myles Morse, ORD/NCER, at 202-343-9706 or morse.myles@epa.gov, or Debbie Westerman, ORD/NRMRL, at 513-569-7364 or westerman.debbie@epa.gov.

U.S. Environmental Protection Agency

# Environmental Technology Opportunities Portal

Contact Us

You are here: EPA Home » Environmental Technology Opportunities Portal


ETOP Home
About ETOP
Current Funding Opportunities
Environmental Technology Resources
Where You Live
EPA Environmental Technology R&D Continuum
For Technology Developers:
R & D Proof of Concept Support
Demonstration & Verification
Commercialization
Info Diffusion, Utilization, Partnerships, & Advocacy
Environmental Technology Council & Forum
NACEPT Subcommittee on ET & Forum
Quality Assurance
Search


**Special Announcements**

**The NACEPT has published its second report EPA Technology Programs: Engaging the Marketplace on EPA's relationships, interactions, and communication with entities that comprise the marketplace for new technologies.** (PDF, 72 pp., 1.3 MB, about PDF)

**The first report, EPA Technology Programs and Intra-Agency Coordination, focused on the internal structure, efficacy, and communication aspects of EPA's technology programs.** (PDF, 56 pp., 807 KB, about PDF)

**Special Announcement**

**New funding opportunities have been announced for graduate environmental study, algal blooms, pharmacokinetic modeling, particulate matter, environmental health outcome indicators, nanomaterials, and others. (read more)**

Environmental Technology
ETOP
Opportunities Portal

**Search**

**Integrated Database Search**

GO

Advanced Search

**Search:**

All EPA This Area

GO

ETOP Mailing List
EnvirotechNews Latest Issue
EnvirotechNews Mailing List
Request a Technology Connection

The Environmental Technology Opportunities Portal (ETOP) links you to programs that help fund development of new environmental technologies and offers information on existing environmental technologies.

**Environmental Technology Research & Development Continuum**

EPA has developed a guide (called the "Environmental Technology Research & Development Continuum") to the EPA programs that address environmental technology, and the type of support these programs provide along the path from development to commercialization.

EPA opportunities have been mapped onto the Continuum to help encourage academic, public, and private sector developers to invest time and money in the creation of new, cost-effective environmental technologies.

Successful environmental technologies progress along the research and development (R&D) continuum from basic research to full-scale commercialization and utilization. Technologies that fail to perform or are economically infeasible are dropped. This continuum generally includes six stages (This is not always a step-wise process and the boundaries between these six dependent activities are often blurred.):

1. Basic research and proof of concept;
2. Technology development;
3. Demonstration at either pilot or full scale;
4. Verification of performance at commercialization stage;
5. Commercialization by the private sector; and
6. Diffusion/utilization by customers

The definitions used above are to give clarity rather than provide complete detail and definitive context for all EPA programs.

In the Continuum, click on the Program Name to get a brief overview, the target media areas, the purpose and type of support provided by EPA, the activity costs (if any), the approximate FY06 funding, and the responsible EPA office."

| EPA Environmental Technology Research & Development Continuum | For Technology Developers | Technology Users |
|---|---|---|
| Overview of EPA environmental technology assistance programs (including financial, testing, verification, incentive, partnership, advocacy and information) \| More Info \| | Are you a developer looking for funding/assistance in developing, commercializing, or testing a new Environmental Technology? \| More Info \| | Are you a technology user looking for information on existing Environmental Technologies? \| More Info \| |

DOE Announces Energy Assistance for New Orleans Public Schools; DOE Encourages Rebuilding Effort's Focus on Efficiency

DOE Awards $3.8 Million in Funding to 38 U.S. Universities for Nuclear Research Infrastructure

EPA and NIEHS Award $7.5M Grant to UC Davis for Renewed Autism Research

Climate Technology: DOE Readies First Big U.S. Projects in CO2 Capture and Storage

Grantee Gets New Sustainability Award

DOE to Provide up to $21.5 million for Research to Improve Vehicle Efficiency

Novel Technology Locates Potential Carbon Sequestration Areas

DOE to Award $16 Million for GNEP Studies; Teams to Provide Analysis on Technology Development

United States and Canada Interested in Co-Verification

Bioengineering for Pollution Prevention Through Development of Biobased Materials and Energy

Read more news from ETOP

## J. EPA Technology Programs

As illustrated in the EPA Technology Development Continuum, EPA has a range of technology programs that can assist in addressing environmental problems. Some of the most popular programs that have provided assistance to current ETC Action Teams are the SBIR, ETV, and Federal Technology Transfer Act (FTTA)/Cooperative Research and Development Agreement (CRADA) programs. The Action Teams that have used these programs are indicated below.

Action Teams Using the SBIR program
- Lead Paint
- Microbial Contamination of Water

Action Team Using FTTA/CRADA
- Lead Paint

Action Teams Using the ETV program
- Microbial Contamination of Water
- Remote Sensing
- Waste to Energy
- Pesticide Drift Reduction Technologies

These EPA technology programs are briefly described below. There is more information about them in the first NACEPT Report, *EPA Technology Programs and Intra-Agency Coordination*, May 2006, which is available on the ETOP web site, http://www.epa.gov/environmentaltechnology/forum/about/report.html.

### 1. Small Business Innovation Research (SBIR) Program

Through the SBIR program, EPA can provide funding for technology development from proof of concept (Phase I) through commercial prototype (Phase II) through competitive solicitations for small businesses. In addition to providing grants averaging $295,000 for the core activities of proof of concept and prototype development, the SBIR program encourages further development leading to commercialization by offering additional funding of $70,000 to firms that have secured third-party financing for accelerating commercialization of the technology and up to $50,000 to support verification of technologies accepted into EPA's Environmental Technology Verification (ETV) Program. Areas of technology grant focus are chosen each year and can cover all environmental media. SBIR final reports can be viewed at http://es.epa.gov/ncer/sbir/.

### 2. Environmental Technology Verification (ETV) Program

The ETV Program develops testing protocols and verifies the performance of innovative technologies with the potential to more efficiently and effectively protect human health and the environment. The ETV Program provides independent performance verification data for commercial-ready technologies to help purchasers and permitters evaluate which technologies to select to solve environmental problems.

The ETV program has developed 88 consensus testing protocols for various technology categories through the efforts of 19 stakeholder groups and has completed 381 verification tests and reports for innovative air, water, and monitoring technologies. Both the protocols and test reports are posted on the ETV Web Site (http://www.epa.gov/etv), which receives more than 3 million hits a year. ETV testing protocols are used around the world to evaluate commercial-ready technologies. An average verification costs about $80,000, and ETV currently funds approximately 50% of the cost of the verification; the vendor and other partners fund the remaining 50%. Technology advocates can subscribe to ETVoice at http://www.epa.gov/etv/.

3. New England Center for Environmental Industry and Technology (CEIT)

The EPA Region 1 CEIT provides access to resources, people, and programs for the environmental technology industry in New England and promotes the acceptance of innovative environmental technologies to solve the most significant environmental problems in New England. New England has a significant number of environmental technology developers. CEIT was established in 1993 to help these companies get their technologies into the marketplace.

Over time, CEIT has developed a number of information services that cover the entire technology continuum. CEIT connects technology developers with funding sources as well as verification and demonstration opportunities through the CEIT Web Site (www.epa.gov/NE/assistance/ceit/). It also offers an advisory service to technology developers at any stage, and provides them with opportunities to market their technologies on CEIT's Web-based Innovative Technology Inventory and Virtual Trade Shows.

4. Federal Technology Transfer Act (FTTA) Activities

The FTTA allows for negotiated agreements between specific EPA offices or laboratories/centers and external organizations to undertake joint research projects, exchange materials, or license EPA-developed technologies. The FTTA provides a mechanism for cooperative research and development partnerships. Through the FTTA program, federal agencies can conduct joint research with non-federal partners and protect intellectual property that may be developed. See http://www.epa.gov/osp/ftta.htm for details.

The alliance that is formed through the FTTA program supports and improves U.S. competitive positions worldwide, helps remove barriers to collaboration, and encourages cooperative research and development with the goal of commercialization. CRADAs allow non-federal parties to collaborate on projects with the EPA and share in-kind resources. Non-federal parties can provide direct funds as well, but the Agency cannot. EPA also can license technologies developed within the Agency to external parties and accept royalties. Royalties are split between the EPA laboratory where the technology was developed and the inventor(s). Technology advocates can subscribe to EPATechMatch at http://www.epatechmatch.com/epa/index.aspx.

These and other EPA technology programs partner with other federal agencies, states, manufacturers, and others. These programs can be key internal EPA vehicles for building partnerships with external partners with expertise, interest, and resources for environmental technology-based business development.

# III. Non-EPA Technology Resources and Potential Partners

## A. Collaborating with Federal Technology Programs

There is a broad range of technology development opportunities available through partnerships with other federal departments and agencies. Some federal partnership efforts offer the potential to provide funding for technology research and development projects.

For example, the Department of Defense (DoD) Strategic Environmental Research and Development Program (SERDP), which focuses on fundamental energy and environmental research (see http://www.serdp.org/ for details) and the Environmental Security Technology Certification Program (ESTCP), which focuses on the application and commercialization of energy and environmental technologies, offer opportunities to support technology development, as well as to verify its performance for defense applications (see http://www.estcp.org/ for details). NACEPT recommended that EPA expand its existing efforts to partner with other federal programs.[1]

Opportunities for partnerships with other federal agencies can be broadly grouped into three categories:

1. Federal support for technology development
2. Federal support for technology transfer
3. Federal support for business development, with a technology focus

The following sections are not exhaustive or comprehensive in describing these three categories of partnership, but they give a flavor of where opportunities may exist for you as a technology advocate. You will discover specific examples that are well-suited for your EPA organization, as you engage your networks and pursue specific projects.

### 1. Federal Support for Technology Development

There are several federal agencies supporting technology development with an environmental focus, where such technology development is done directly at agency research facilities or via research contracts and/or grants.

The Department of Energy is one of the largest funders of environmental technology in the world, devoting billions of dollars per year to various programs. DOE has an extensive set of research laboratories around the country, with one in nearly every EPA region (a list of DOE labs is given in the appendix, along with a short synopsis of their environmental technology focus). These DOE laboratories offer rich opportunities to partner on technology development, commercialization, and adoption, on topics ranging from energy efficient building design to remediating heavy metals in soil using microorganisms (an example is given, below). The appendix contains a list of many DOE programs focusing on research challenges having an environmental component, and identifies the office or laboratory where this work is taking place.

[1] A description of these DoD-EPA partnerships is available in the second NACEPT report, *EPA Technology Programs: Engaging the Marketplace,* May 2007

Other federal agencies supporting technology development to improve environmental performance include the Department of Agriculture, the Department of Transportation, the Department of Commerce, and the Department of Defense. Within the Department of Commerce, the National Institute for Standards and Technology (NIST) has several important programs, such as the Advanced Technology Program (ATP).

One ETC Action Team, for example, executed an EPA-DOE Memorandum of Understanding (MOU) to formalize joint research programs. The "Microbial Contamination of Water" Action Team established the MOU with DOE's Sandia National Laboratories to conduct joint research on Insulator-based Dielectrophoresis Technology for concentrating pathogens for water samples.

The Innovative Treatment Remediation Demonstration (ITRD) Program is funded by the DOE Office of Environmental Restoration (EM-40) to help accelerate the adoption and implementation of new and innovative remediation technologies. Developed as a Public-Private Partnership program with Clean Sites, Inc., and EPA's Technology Innovation Program (TIP) and coordinated by Sandia National Laboratories, the ITRD Program attempts to reduce many of the classic barriers to the use of new technologies by involving government, industry, and regulatory agencies in the assessment, implementation, and validation of innovative technologies.

## 2. Federal Support for Technology Transfer

One of the most critical roles you will play as a technology advocate is to facilitate transfer of environmental technology from technology developers or vendors into the application and use of these technologies to improve environmental performance. The good news in this case is that there are many current efforts within the federal family to promote technology transfer, and you have many potential partners in agencies or departments with a focus on environmental technologies.

One of the most effective tools for technology transfer is the Small Business Innovation Research Program (SBIR). We have already discussed EPA's SBIR program. It is important to note that other agencies with major research budgets also have SBIR programs focusing on environmental technology. The Department of Energy has a very large program, but other agencies do as well (Department of Transportation, Department of Agriculture, etc.). One of the questions that may arise is how to utilize these SBIR programs. Participating in SBIR project review panels, attending workshops or conferences at various agencies where SBIR grantees present their results, and partnering with SBIR officials in these agencies to explore opportunities to support environmental technology among those who do and do not receive an SBIR award are all ways to create value in the technology continuum.

You can also develop relationships and work with colleagues in the technology transfer offices or departments of federal and federally-supported research organizations. Technology transfer is a major priority for nearly every federal agency involved in research and development, so you have a rich source of potential partners. For example, nearly all DOE laboratories have a technology transfer office, whose responsibility is to create partnerships for the transfer and adoption of discoveries made in those research organizations. This is also true for other agencies

(like the National Institutes of Health). Some of these technology transfer offices are well-networked with entrepreneurs and business development programs, while others primarily focus on patent licensing, with very little expertise or interest in the whole technology development continuum. By networking with technology transfer professionals in other federal organizations, you will quickly learn with whom you can form the most effective partnerships.

A third mechanism for technology transfer is through Cooperative Research and Development Agreements (CRADAs), which are similar to EPA CRADAs. These agreements create partnerships between federal and federally-supported research organizations and business or other entities, in the pursuit of a particular research goal. In the case of environmental technologies, CRADAs are often used to take an innovative technology or technology platform and develop a bench- or commercial-scale product. You can go to the same federal partners you will work with on SBIR and technology transfer issues, and develop communications network on CRADAs that focus on environmental technology. The results and/or spin-offs from these CRADAs may be rich vein of innovation that you can help to cultivate as part of your portfolio.

One of the most extensive and successful delivery mechanisms for technology transfer is the Manufacturing Extension Partnership (MEP), which is managed by NIST within the Department of Commerce. The MEP is a nationwide network of not-for-profit centers in over 400 locations nationwide. Their sole purpose is to provide small- and medium-sized manufacturers with the help they need to succeed. The centers are funded by federal, state, local and private resources. Each center works directly with area manufacturers to provide expertise and services tailored to their most critical needs, which range from process improvements and worker training to business practices and applications of information technology. Solutions are offered through assistance from center staff and outside consultants. Centers often help small firms overcome barriers in locating and obtaining private-sector resources. The MEP has a successful history of working with EPA. It is always seeking to expand these relationships in the area of environmental technology. The MEP is also discussed under sections A.3 and B.4.

### 3. Federal Support for Business Development with a Technology Focus

A third area of potentially valuable partnerships is with federal agencies and programs that focus on promoting development of technology-based businesses. In most cases, such programs are unlikely to be solely focused on environmental technology, but it is also likely to find partners and collaborators who are extremely interested in working with EPA.

As one can see from how EPA's environmental technology programs are distributed along the EPA Technology Development Continuum, EPA has historically counted on the private sector to be solely responsible for commercialization activities. This is *not* the case with other federal agencies; there are a number of programs in the federal government that directly support businesses trying to commercialize or expand technology-based ventures. While EPA, in the near term, is unlikely to expand its programs into supporting commercialization activities, you can certainly take advantage of existing programs to create strategic partnerships with other agencies, particularly in cases where those other agencies have an interest in environmental technologies.

The Department of Commerce has several programs and offices that support business development and have a history of working with EPA. The **Manufacturing Extension Partnership (MEP)** was described in the previous section, and is one of the most extensive programs for delivering support directly to small and medium-sized manufacturing businesses. MEP already works with the EPA's Green Suppliers' Network (OPPT) and the Lean Manufacturing Team (OPEI) on identifying and developing technologies to incorporate as part of the manufacturing processes and environmental technologies/products for environmental product lines.

MEP is currently collaborating with DOE on promoting energy efficiency in small manufacturers, and also is looking for opportunities for manufacturers to produce products that promote energy efficiency. MEP offices in individual states have developed exciting and innovative programs around environmental goods and services, and many have expressed great interest in expanding their working relationship with EPA. These State and local MEP offices offer great potential for working directly with businesses as both purchasers and suppliers of environmental technology.

The **Economic Development Agency (EDA)** is another Department of Commerce organization supporting business development. EDA has specific programs in brownfield redevelopment, developments on military bases that have been realigned or closed (BRAC), and post-disaster redevelopment. In some cases, economic (re)development activities provide opportunities to deploy environmental technologies from the "ground up," as investment are being made in infrastructure, commercial, and residential capital. In other words, they create potential demand for technologies that improve environmental performance, promote sustainability, and lead to better immediate and long-term economic results. In other cases, these activities provide opportunities to support economic activities around production of environmental goods and services. EDA has offices around the country.

The **International Trade Administration (ITA)** is yet another Department of Commerce organization with an interest in promoting environmental technology. Within their mandate to provide for the foreign trade of the United States, environmental technology is one of the seven priority industries for ITA's international trade promotion portfolio. Expanding global markets for U.S.-led environmental technology is the mission for the Office of Environmental Industries. ITA leads trade missions to other countries to promote production and export of environmental goods and services, and could be a valuable source of partnerships. For example, in April 2007, ITA led a Clean-Energy Technologies Trade Mission to India and China. This mission aimed to match participating U.S. companies with opportunities in these fast-growing markets, where American clean technology goods and services can help improve the environment. ITA has an office of its Commercial Service in every major U.S. city.

Another federal organization supporting businesses engaged in foreign trade is the **U.S. Export-Import Bank (ExIm Bank)**. The ExIm Bank provides a number of financial instruments to assist U.S. companies in developing commercial conduits for their goods and services. The Environmental Exports Program is an ExIm Bank initiative created in 1994 to increase support of environmentally beneficial goods and services for export. The ExIm Bank works with U.S. environmental industries. Its project portfolio includes helping to finance U.S. exports of renewable energy equipment, wastewater treatment projects, air pollution technologies, waste management services, and many others. The director of the Environmental

Exports Program has shown great interest in working with EPA to help support environmental technology.

The Workforce Innovation and Regional Economic Development (WIRED) program at the **Department of Labor's Employment and Training Administration** provides grants to regions around the U.S., to support workforce training and economic development, including business support for innovative technologies. The regional grants provide a source of funds for regional priorities, and regional boards disburse the grant funds for specific projects in their regions, consistent with regional priorities. Many of the WIRED regions have identified environmental industries (i.e., energy efficiency, renewable energy) as priorities in their regions. You can serve as liaison to link EPA initiatives and priorities to the WIRED initiative through their State partners. Staff and managers at WIRED have expressed great interest in working more closely with EPA to integrate WIRED with EPA's technology and training programs. WIRED is also discussed under **Regional/State Sources of Funding for Environmental Technology**, below.

The **Small Business Administration (SBA)** has several programs oriented toward promoting business development for technology led ventures. In addition to overseeing government-wide programs like the SBIR and Small Business Technology Transfer (STTR) programs, SBA provides services directly to businesses seeking support. The Office of Entrepreneurial Development (OED) oversees a network of programs and services that support the training and counseling needs of small business. It is SBA's technical assistance arm with resource partners located throughout the country. These include the Small Business Development Centers (SBDCs), which offer one-stop assistance to individuals and small businesses by providing a wide variety of information and guidance in branch locations across the country. Some SBDCs have staff familiar with the needs and opportunities for businesses founded on environmental technology, and are in a position to provide access and insight to an extensive set of resources.

Entrepreneurial or venture forums are another way that federal organizations help to promote commercialization activity for environmental technology. One example of this type of opportunity can be found at DOE's **National Renewable Energy Laboratory's (NREL)** Industry Grown Forum. NREL's Industry Growth Forums bring together start-up clean energy companies, venture capitalists, and senior business executives to catalyze learning about business growth strategies and facilitate strategic business partnerships. Forums provide a venue for companies to present and receive feedback on summary business plans before a panel of venture capitalists and other business executives interested in the industry, businesses, and technologies discussed. Federal labs in other regions sponsor similar events. Such forums can be an excellent way to facilitate linkages between technology developers and commercialization support resources.

These are just a few examples of federal programs that could serve as a source of valuable partnerships. There are other federal programs, as well, that could be leveraged to support business development for environmental technologies. The ones described here are to give you a sense of the many possibilities. As you develop your communications networks and engage in technology advocacy activities, you will be able to identify and utilize these or similar programs that meet your particular needs.

## B. Collaborating with State and Regional Associations

There exists a huge array of State and regional organizations/entities that could represent extremely valuable partnership opportunities. Because so much environmental technology development, commercialization, and deployment occurs in local settings, you would be well-served by actively exploring and engaging State and regional partners to become part of your communication and collaboration networks.

Given the wide range of organizations associated with various elements of environmental technology, this handbook will touch on several categories and provide a few, brief illustrative examples. The real value will be in using this overview to help develop an array of partners and collaborators germane to your portfolio of activities. One can group State and regional organizations into the following categories:

1. State technology business centers
2. State university/regional incubators
3. Regional ET partnership
4. Regional/state sources of funding for environmental technology
5. State-sponsored venture capital funds
6. Multi-state organizations for environmental issues

### 1. State Technology Business Centers

One of the key assets for States in promoting technology-led economic development is through State-supported business support centers. Such centers draw resources from a number of sources, including State operating budgets, federal funds, matching contributions from client business, private donations, and a number of other funding mechanisms. What these centers have in common is an interest in promoting technology-led innovation to create economic activity within their States. The centers provide an entrée to State-level resources, many of which are entirely consistent with promoting environment technology.

One example of this type of business-support center is Virginia's Center for Innovative Technology (CIT; www. cit.org). From its original mission to enhance the research and technology transfer activities of Virginia universities, CIT has moved its focus toward the new technologies, entrepreneurs, and technology companies. CIT's current operating structure consists of service lines that enable it to respond quickly and efficiently to new opportunities with government and private sector clients.

Another example is New York's Energy and Environmental Technology Applications Center (E2TAC) in Albany, New York. The mission of E2TAC is to provide a critical platform for Albany NanoTech to leverage local research innovations advanced research infrastructure by providing a broad set of resources supporting technology development that leads to the integration of microelectronics and nanotechnology for advanced energy and environmental applications. One of the services E2TAC provides is a project to expand the renewable energy business in New York State. The work will focus on encouraging economic development and developing specific renewable technology industry clusters around photovoltaics, power electronics, and advanced materials.

## 2. State University/Regional Incubators

While some States directly administer or support centers for technology business development, it is more common for States to support these type of center through public universities. Because most public university systems have active research programs in environmental technology, and technology transfer is a large and growing priority for academic research institutions, most States see university-based technology business development centers and incubators as an effective model for promoting technology commercialization. Nearly every State has at least one such university-based business development and/or incubator, and a large number of these have programs specifically oriented around environmental technology. Developing communications and working relationships with one or more of these programs would be very effective, since these types of programs are constantly emerging and evolving.

One example of a university-based incubator is the Environmental Business and Technology Center (EBTC), at the University of Massachusetts (UMass). EBTC was created in 1994 as part of a collaboration among the State, UMass, and industry to promote the economic development of environmentally proactive industries. It is Massachusetts' venture development center for early stage, environmentally proactive technology businesses. EBTC helps bring economically viable, environmentally advantageous technologies related to clean water, renewable energy, and better materials and industrial processes to the market by mobilizing resources at UMass, regulatory expertise, and contacts with financial service providers and investors.

## 3. Regional Environmental Technology Partnerships

There are a number of regional partnerships that either focus on a particular environmental technology or incorporate environmental technology as part of the set of solutions. In some instances, partnerships are initiated by EPA organizations and in others EPA may not be the primary organizer but would be a welcome partner. In both types of cases, there is an obvious role for an environmental technology advocate.

One example of an EPA-led regional partnership is the Blue Skyways Collaborative. Blue Skyways is a voluntary, public-private partnership comprising 10 States, 6 federal agencies, 2 EPA regions (Regions 6 and 7), 10 major companies, the Central States Air Resources Agencies, NGOs, local government representatives, and representatives of Canada and Mexico. The goals of the collaborative are to promote quicker phase-out of older, legacy diesel trucks and off-road engines, expand energy efficiency and alternative energy, focus on emissions reductions in important transportation nodes (airports, ports, rail centers), expand use of alternative fuels, pursue aggressive outreach and funding identification. Working with a creative portfolio of funding sources, the collaborative has been successful in launching projects to deploy technological solutions to the air problems the Collaborative is addressing.

## 4. Regional/State Sources of Funding for Environmental Technology

Some of the most potent opportunities for partnerships on environmental technology come through State- or locally-administered grants to support R&D and economic development, where these grants are funded by larger block-style grants from federal agencies. In these cases,

States or regional entities fund local projects that often can support or promote the development and adoption of environmental technologies. Three examples are provided here. In some cases, you will be able to develop partnerships with the local funding entities (e.g., State lead agencies) to leverage EPA goals/program by providing advice and input on where the funding entities can direct funding opportunities. In other cases, you will be able to communicate with partners who would be eligible grantees, directing their attention to these opportunities.

One example of a sizable grant program, discussed in the previous section on federal technology partnerships is the Workforce Innovations and Regional Economic Development (WIRED) grant program, funded by the Department of Commerce. Groups of counties within a particular State are grouped into a region, with the State providing the application and support to the WIRED program. Each grantee region identifies a set of industries that will be supported with the grant, and there is wide flexibility in the types of projects supported by the WIRED initiative. Projects range from supporting technology curricula in secondary schools and colleges, to providing research funds and research scholarships for university-based technology research, to providing outreach and support for individual businesses and industries involved in transforming their manufacturing or business posture.

Many of the WIRED regions around the country focus on industries directly relevant to environmental technology, including energy efficiency, renewable energy, and biofuels, to name just a few target industries. More than $200 million in grants have been made to WIRED regions since early 2006, and these are already being used to support projects in individual WIRED regions, with many of the WIRED regions currently gearing up to announce local solicitations.

Another example of regionally-administered grants is the SunGrant initiative, which focuses on research and development for biomass systems supporting biofuels development (www. sungrant.org). The SunGrant initiative has five regional centers based in universities around the country, with each regional center responsible for administering grant programs across the States in their particular region. The initiative was initially funded with a $40 million grant from the Department of Transportation. Each of the centers has recently published requests for proposals for research in this active area of environmental technology.

SunGrant is successfully engaging other federal agencies as partners, and has expressed great interest in working more closely with EPA. Much of the R&D that SunGrant will support is extremely relevant to the environmental technology focus of EPA. You might find it useful to explore partnerships with colleagues in both the SunGrant centers, and among university researchers who might benefit from leveraging EPA support with a SunGrant proposal (and vice versa).

A slightly different type of funding partnership is represented by the DOE-supported Industrial Assessment Centers.[2] These centers are located at 26 universities around the country. They conduct energy audits or industrial assessments and provide recommendations to manufacturers to help them identify opportunities to improve productivity, reduce waste, and save energy. Centers are selected through a competitive solicitation process.

The Department of Energy recently signed memoranda of understanding with both the National Association of Manufacturers (NAM) and the Department of Commerce's

[2] Website for industrial assessment centers: www1.eere.energy.gov/industry/bestpractices/iacs.html

Manufacturing Extension Partnership (MEP) to run a multi-million dollar program to conduct energy audits at thousands of manufacturers around the country. As noted above, the recommendations of these audits provide opportunities to deploy numerous environmental technologies, and MEP has expressed great interest in cooperating with EPA to partner in developing a portfolio of technology solutions that manufacturers can use to implement recommendations. You have the opportunity to work with MEP centers and/or Industrial Assessment Centers to help create additional value in these partnerships.

These are just three examples of federal/State/regional partnerships with scope for promoting environmental technology, and having a strong funding base. In each case, program leaders have expressed great interest in working with EPA at the regional level. There are, no doubt, additional examples of such partnerships and these are great opportunities to leverage and expand the scope of your influence.

## 5. State-Sponsored Investment Capital Funds

In addition to the federal funds that States use to fund environmental technology, a growing number of States are establishing their own venture investment funds. The core idea underlying State venture funds is the importance of securing early stage funding for promising technologies that can help foster economic growth in the State. Many emerging technology businesses face difficulties securing financing in the transition between R&D and scale-up (where venture capital typically becomes available). As a result, some States have developed State-sponsored investment funds, many of which specifically include environmental technologies in targeting investments. You may find it helpful to contact and work with State-sponsored investment organizations in identifying opportunities to promote environmental technology. This section includes a couple of illustrative examples.

One example of a State-sponsored fund is the Massachusetts Technology Development Corporation (MTDC; www.mtdc.com). In 1978, the Commonwealth enacted a law creating the Massachusetts Technology Development Corporation, which was established to address the "capital gap" for start-up and expansion of early-stage technology companies. From 1980 through June 30, 2006, MTDC's total cumulative investments from all of its investment programs were more than $72 million in 122 companies. The Corporation is self-supporting based on returns from previous investments. The size of MTDC's initial funding to an applicant is determined by the capital needs of the firm and the investment of the co-investors. Though initial investments can range up to a maximum of $500,000, most are typically in the $250,000 to $500,000 range.

Another representative program is the Kansas Technology Enterprise Corporation (KTEC; www.ktec.com). KTEC is a private/public partnership established by the state of Kansas to promote technology based economic development. Through support of strategic research and development at Centers of Excellence, through intense hands-on business assistance at incubators, and through equity investments in early-stage companies, KTEC partners with companies to promote economic growth in Kansas. A fairly modest program, KTEC allocates $1.5 million from the State of Kansas every year, and makes direct investments in early-stage companies that commercialize unique technologies and have the potential to create high-paying jobs in Kansas.

A third illustrative example is Connecticut Innovations (www.ctinnovations.com), which provides strategic capital and operational insight to push the frontiers of high-tech industries such as energy, biotechnology, information technology, and photonics. Created by the Connecticut Legislature in 1989, Connecticut Innovation has helped over 100 emerging companies to research, develop, and market new products and services. This activity has attracted over $1 billion dollars in additional investments from private equity providers. CI has brought the State of Connecticut over $510 million in Gross State Profit and over 5,000 additional job-years. In addition, Connecticut Innovation is undertaking State-wide efforts to provide State residents with clean energy alternatives for their homes and businesses through the Connecticut Clean Energy Fund.

Again, these are only three examples of the many State-sponsored investment funds that could be important components of your network and valuable partners for the activities and projects you work on.

## 6. Multi-State Organizations for Environmental Issues

There are several multi-State organizations you should keep in mind, which focus on coordinating member States' interests with respect to environmental technology. In some cases, these organizations focus on general policy development, and in other cases, may focus closely on specific environmental technology issues.

As discussed earlier, the **Interstate Technology and Regulatory Council (ITRC)** is a State-led coalition of State and federal regulators, industry, and stakeholders working together to achieve regulatory acceptance of environmental technologies (www. itrcweb.org). ITRC consists of 47 states, the District of Columbia, multiple federal partners, industry participants, and other stakeholders, cooperating to break down barriers and reduce compliance costs, making it easier to use new technologies, and helping States maximize resources. The ITRC brings together a diverse mix of environmental experts and stakeholders from both the public and private sectors to broaden and deepen technical knowledge and streamline the regulation of new environmental technologies. The ITRC accomplishes its mission in two ways: it develops guidance documents and training courses to meet the needs of both regulators and environmental consultants, and it works with State representatives to ensure that ITRC products and services have maximum impact among state environmental agencies and technology users.

The **Technology Acceptance and Reciprocity Partnership (TARP)** is a coalition of eight State environmental leaders (California, Illinois, Massachusetts, Maryland, New Jersey, New York, Pennsylvania, and Virginia) that have set up a mechanism for States to develop common testing protocols for technology vendors to use to demonstrate the effectiveness of their technologies. This mechanism provides a unique pathway for technology developers to use among these States and others to develop credible data, reduce costly duplicative field testing, and gain regulatory acceptance.

Through the development of common testing protocols and the sharing of technology performance data, TARP believes they can: (1) help States make scientifically sound, faster

decisions; (2) help States implement cost-effective environmental solutions; and (3) help speed technology diffusion across States. [3]

**The Environmental Council of States (ECOS)** is the national non-profit, non-partisan association of State and territorial environmental agency leaders. The purpose of ECOS is to improve the capability of State environmental agencies and their leaders to protect and improve human health and the environment of the United States of America. See http://www.ecos.org.

[3] See http://www.dep.state.pa.us/dep/deputate/pollprev/techservices/tarp/index.htm for details. ITRC, and TARP also are described in the second NACEPT report, *EPA Technology Programs: Engaging the Marketplace,* May 2007.

## C. Collaborating with External Technology Groups and Industry

Technology developers often are interested in commercializing their environmental technologies and seek federal assistance for their needs. In general, commercialization activities are private sector functions; however, some federal agencies like the DOE National Renewable Energy Research Laboratory (NREL) through their annual Industry Growth Forum (see http://cleanenergyforum.com/) do host large venture capital conferences.

There are national and State incubation associations that attempt to link technology vendors with commercialization support. See the National Business Incubation Association (http://www.nbia.org) for a description of these associations and points of contact. The Alliance of Clean Energy Business Incubators, also provides business and financial services to the needs of the clean energy community. See http://www.cleanenergyalliance.com/.

Some businesses specialize in environmental technology commercialization efforts such as the Environmental Business Cluster, which has helped more than 120 businesses commercialize and market their products and services, see http://www.environmentalcluster.org for details. Dr. Jim Robbins, Director, Environmental Business Cluster, served on the NACEPT Subcommittee that prepared the two reports cited in this document.

Professional and trade associations also offer opportunities to work with industry. Following is a list of some of these associations:

- The American Institute of Chemical Engineers, see http://www.aiche.org/ for details;
- The American Chemical Society, see https://portal.chemistry.org/portal/acs/corg/memberapp for details;
- The Institute of Electrical and Electronic Engineers (http://www.ieee.org/portal/site);
- The American Association of Mechanical Engineers (http://www.ieee.org/portal/site);
- The Air and Waste Management Association (http://www.awma.org/);
- The Environmental Industry Association, parent organization for the National Solid Waste Management Association (NSWMA) and the Waste Equipment Technology Association (WASTEC), see http://www.envasns.org/ for details; and
- The Solid Waste Management Association (http://www.swana.org/www/default.aspx).

## D. Collaborating with International Contacts

Over the past 40 years, as many developed and developing countries around the world have embraced the value of protecting human health and the environment, the prominence of U.S. environmental technologies to solve global environmental problems has diminished. Some European and Asian countries have developed very sophisticated control and treatment technologies, as well as voluntary sustainable product and services initiatives that will affect the U.S. market.

Some countries, such as Canada, and groups of countries, like the European Union (EU), have developed environmental technology programs that are tailored to their local environmental requirements. There is no EU ETV program, but there are a number of voluntary European initiatives in the environmental field that include third-party verification. The 15-year-old European Eco-label (the flower label) Program is probably the largest and best know voluntary initiative. The Eco-label, similar to the U.S. Energy Star Program, is awarded to products and services with reduced environmental impacts. The Eco-label is built on a set of environmental criteria; license holders are certified by an independent party. See http://ec.europa.eu.int/ecolabel.

Canada has both an ETV and a sustainable technology development program. Established in 1997, ETV Canada is an independent verification organization that offers an assessment process for verifying the environmental performance claims associated with Canadian projects and programs, as well as technologies and technological processes. See http://etvcanada.ca.

Sustainable Development Technology Canada (SDTC) is a non-profit foundation, created by the Canadian government but operating as an independent, "arms length" organization, which finances and supports the development and demonstration of clean technologies that provide solutions to a wide range of environmental problems. SDTC focuses its efforts on the pre-commercialization stage of technology development and funds groups of companies (i.e., consortia) to strengthen their "got to market" capabilities. See http://www.sdtc.ca/en/.

In July 2005, The EPA ETV Program hosted an ETV International Forum that included representatives from 14 countries involved in environmental technology verification, testing, and development. See http://www.epa.gov/etv.

# APPENDIX

## 1. Creation of the Environmental Technology Council (ETC)

a. Administrator's Memorandum Authorizing the ETC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 12 2004

OFFICE OF THE
ADMINISTRATOR

MEMORANDUM

SUBJECT: Appointments to the Environmental Technology Subcommittee of the National Advisory Council for Environmental Policy and Technology

FROM: Paul Gilman
Assistant Administrator
Office of Research and Development

Daiva Balkus
Director
Office of Cooperative Environmental Management

TO: The Administrator

The National Advisory Council for Environmental Policy and Technology (NACEPT) has been providing advice to EPA for more than a decade on actions the Agency can take to improve its environmental technology programs. It produced a series of reports in the early 1990s on different aspects of the Agency's environmental technology programs, and has periodically provided advice to the Agency on these topics since then. For several reasons, we believe that a Subcommittee of the Council should be formed to concentrate solely on these issues.

Because of its history, NACEPT is uniquely positioned to provide the Agency retrospective assessments of, and prospective advice on, its environmental technology programs. We also believe that an environmental technology subcommittee of NACEPT would be an extremely valuable complement to the Environmental Technology Council that you established in June. An environmental technology subcommittee of NACEPT would provide the Technology Council, the Agency, and you with advice and recommendations from a diverse and accomplished group of experts that would be of great help to us as we assess and revise EPA's environmental technology programs through collaborative approaches involving the public and private sectors.

We are recommending the group of experts listed in the following attachments for membership on the NACEPT Environmental Technology Subcommittee because of their experience and professional stature in the field of environmental technologies, because of

Internet Address (URL) • http://www.epa.gov
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

## b. Science Advisor's Memorandum Establishing the ETC

**MEMORANDUM**

**SUBJECT:** Establishing an Environmental Technology Council

**TO:** Assistant Administrators
Associate Administrators
Regional Administrators
Deputy Assistant Administrators
Deputy Regional Administrators
Science Policy Council

**FROM:** Paul Gilman, Agency Science Advisor

As directed by Governor Leavitt in the attached memorandum, I am taking steps to establish an Environmental Technology Council. Some of you have participated in earlier discussions of this subject through the Innovation Action Council and other venues. My goal is that the Council quickly establishes a network of people inside and outside the Agency who will engage in robust information exchange and problem solving.

So that we can move forward to address Governor Leavitt's requests, I am asking that each Office and Region provide:

- The name(s) of up to two representatives to the Council (by June 30),
- Up to three prioritized technology/problem opportunities that you would like the Council to address (by July 31),
- Any recent applications of innovative technologies, especially those benefiting from EPA's support programs, that you feel are making a difference in moving to a new level of cost-effective environmental protection (by July 31).

The Council will discuss the problem/technology opportunities submitted and recommend to the Science Policy Council a subset on which to begin work. I think our objective should be to identify opportunities that link as closely as possible to our Agency goals and the Administrator's 500 day plan.

I believe it will be most productive if at least one of your Council representatives is a manager at the Division or Deputy Office Director level. They will have the opportunity to identify others in your organization who may later participate on workgroups and in information exchange. The Council will conduct as much business as possible by teleconference and electronic exchange to minimize time-intensive meetings. We are tentatively planning the first meeting in mid to late July.

The groundwork in developing the mission of the Council to date has been done by representatives from Region I, OSWER, OPEI and ORD. I believe it is appropriate that the initial leadership of the Council will come from these organizations. The draft Charter that they developed is attached if you would like more background on the Council's envisioned goals and functions.

c. ETC Charter

## Environmental Technology Council Charter

### Background

The United States continues to face difficult environmental challenges that often seem intractable or involve high costs. Innovative technologies often hold the key to cost effective, timely solutions that minimize environmental impacts. Governor Leavitt has identified technology as one of three critical elements to moving to a new level of effectiveness in environmental management.

Within the Agency, there are a number of programs and activities which foster the development and use of innovative technologies. By better coordinating and focusing these programs around priority environmental problems, EPA and its partners can better realize the potential that innovative technology brings to environmental protection.

In 2003, Congress mandated that EPA "develop a 'one-stop-shop' office to coordinate similar programs which foster private and public sector development of new, cost-effective environmental technologies". In response to this requirement, EPA in a Report to Congress committed to establish a *'one- stop-shop' web site* linking the Agency's technology programs and to establish an *environmental technology council.*

### Purpose

The Environmental Technology Council (ETC) is established to coordinate and focus the Agency's technology programs in order to:

(1) improve results of core regulatory, enforcement and voluntary programs

(2) facilitate innovative technology solutions to environmental problems and challenges, particularly problems with multi-media implications. The problems addressed will be clearly related to the Agency's strategic plans, and focused on defined environmental outcomes.

### Scope of Activity

Primary activities are to identify technology solutions:

1. Identify the priority environmental problems where technology is a critical factor in providing a cost- effective solution.
2. Screen the problems using stakeholder input to determine priority for the Council's attention.
3. Set up temporary Action Teams to address problems. Each team will evaluate the status of possible technology solutions and recommend actions to address the problem.

Additional activities of the Council include:

4. Create an network of technology contacts in EPA and states to share information routinely through electronic and other communication.
5. Evaluate at appropriate intervals the effectiveness of ETC activities to enhance technology progress or adoption.
6. Serve as a central contact point for analyzing significant new technology proposals recommended by outside organizations or advisory groups such as NACEPT.

All activities will involve collaboration with other federal, state, and industry partners.

**Membership**

The ETC will include one or more representatives from each Agency, Program, and Regional Office. Representatives should be managers or senior technical staff with access to senior managers. Responsibilities of the representatives include the following:

- Participate in the monthly conference call
- Meet with appropriate office or regional staff to identify the most important environmental problem and develop a problem statement for the ETC
- Participate on the Action Team created to address your office or regional problem and other relevant Action Teams.
- Share information from the ETC activities with your region or office

The Council will also include representatives for the states and tribes. Lead contacts from other Agencies will serve in an adjunct capacity to the Council.

**Organization**

*Reporting/Authority*

The Environmental Technology Council will be established by the EPA Science Advisor in his role as Chair of the Science Policy Council (SPC). The Council will report to the EPA Science Advisor through the SPC.

*Officers*

The ETC will be co-chaired by senior representatives from ORD, a Region, and a Program.

**Action Teams**

Action teams will be composed of members of the Council and other appropriate personnel from EPA, states, tribes, and other Agencies. Action Teams are intended to be temporary and will exist as long as needed to meet defined objectives regarding particular environmental problems. The Council defines the charge for each Action Team, and teams will report progress to the Council for discussion and further action. Participation in any Action Team is voluntary. An example of a problem and team approach is attached.

**Accountability**

The ETC will develop an operating plan and submit it to the Science Policy Council no later than October 1st of each fiscal year. The operating plan will include performance measures with expected outcomes linked to the Agency's Strategic Goals.

**Location and Support**

The ETC will be organizationally supported by the Office of Research and Development for at least the first year of its existence. Changes in organizational support will be based on direction from the Science Policy Council. Support will include administrative support for meetings and other activities of the ETC and Action Teams. Additional contractor support will also be provided for data gathering, analyses, and related activities of the Action Teams needed to analyze technology status and recommend actions.

## 2. ETC Action Teams

### a. Action Team Problem Statements

Descriptions of the problems being addressed by the current ETC Action Teams are provided below, along with the individuals who are leading the Team efforts. Progress reports for the ETC Action Teams are available on ETOP at http://www.epa.gov/etop/*problem.html*.

**1. Remote Sensing of Pollutants**

Team Leaders: Barry Feldman, Region 6, and Ken Gigliello, OECA/OC

Problem Statement: States are having problems identifying the sources of emissions that are causing elevated reading of VOCs that can lead to higher ozone and non-compliance with the Clean Air Act (CAA). States that are in not in compliance with the CAA because of higher than allowed levels of criteria pollutants must develop State Implementation Plans to come back into compliance. The States base these plans on an environmental inventory of known sources of pollutants.

The Action Team has four objectives: (1) evaluation of remote imaging devices for leak detection and repair problems; (2) development of measurement protocols for optical remote sensing for non-point source emissions; (3) verification of remote imaging devices for use in industrial leak detection and repair programs (LDAR); and (4) creation of a database of EPA remote sensing projects.

**2. Recovering the Value of Waste for Environmental and Energy Sustainability**

Team Leaders: Donna Perla, ORD, and Larry Gonzalez, OSW

Problem Statement: Two significant environmental and energy problems drive the need for the United States to explore the environmental benefits of using waste as a source for energy (i.e., waste-to-energy fuels). The first problem is that municipalities, hospitals, industry, food processing plants, farms, and disaster response entities are all challenged with the sustainable management of wastes and residues. Each year, the U.S. economy generates 1.4 billion tons of wastes and residue materials. The second problem is the increasing U.S. demand for primary fossil fuel energy, which leads to the depletion of natural resources, the degradation of ecosystems, and the generation of significant amounts of air and water pollution and solid waste. With U.S. energy consumption increasing at an annual average rate of 2.4 percent, the country will continue to see increasing rates of pollution and environmental degradation, if new energy sources are not pursued.

Rather than conducting specific projects, the Action Team operates as a network of cross-EPA Office representatives (ORD, OAR, OSW, Regions 4 and 6), other Federal Departments (Departments of Interior and Agriculture), and stakeholders (industry and trade associations), where significant technical, science, and policy issues related to waste-to-energy have been identified through initial and ongoing dialogues. Some issues the network has been addressing include: the classification of feedstocks, such as the Hurricane Katrina/Rita disaster debris and other biowastes, in the National Biofuels Action Plan; negotiations with various EPA offices

(i.e., OECA, OGC, OSW, and OAQPS) on the use of contaminated disaster debris as a fuel for industrial use; and verification testing of co-fired coal and biomass fuels in boilers.

### 3. Concentrated Animal Feeding Operations (CAFO) Pollution Prevention

Team Leader: Sean Bergin, Region 7

Problem Statement: Animal feeding operations contribute to pollution in air, water, and soil causing ecological damages and risks to human health. The beef, dairy, pork, and poultry industries, when combined, generate six to ten times as much waste as is generated by humans. The major stressors associated with the generation and disposal of these wastes include nutrients (nitrogen and phosphorous), sediments from runoff, veterinary pharmaceuticals (i.e., endocrine disrupting chemicals, arsenic, ivermectin, and antibiotics), pathogenic organisms, and atmospheric emissions of gases and particulates.

The Action Team plans to address four issues: (1) the use of technologies for characterizing and managing air emissions; (2) technologies for managing CAFO wastes; (3) wastewaters and manure that reduce releases of nutrients and pathogens; and (4) technologies and alternative markets for CAFO residuals.

### 4. Arsenic Maximum Contaminant Level (MCL) Compliance for Small Drinking Water Systems

Team Leaders: Tom Huetteman and Bruce Macler, Region 9; and Eric Burneson, OW

Problem Statement: Arsenic is a well-known cause of a variety of cancers and other serious diseases. In January 2001 based on substantial health information, EPA revised its drinking water MCL from 50 µg/L to 10 µg/L. This revision applies to all community water systems but will disproportionally affect small ground water systems. The revision was effective in 2006. Nationwide, about 90 percent of systems affected by the rule are small ground water systems serving populations of 3,300 or less people. Until this revision, most of these ground water systems have had few regulatory requirements.

In 2004, when the Action Team was formed, its primary focus was on developing training and outreach materials for small drinking water system operators on treatment options to bring their systems into compliance with the new drinking water regulations for arsenic. The team also recognized the challenge to private well owners in addressing arsenic contamination. At the same time the Action Team was being formed, the ORD National Risk Management Research Laboratory and the OW Office of Ground Water and Drinking Water (OGWDW) were preparing research plans to develop many of the tools envisioned by the Team. ORD, in particular, was interested in supporting demonstration projects, as well as developing education and outreach materials. The formation of the Action Team helped to create better Regional participation into the development of these plans.

By late 2006, the Action Team completed its work on the development training and outreach materials. The results of their combined efforts are available at http://www.epa.gov/OGWDW/arsenic/compliance.html.

**5. Technologies Promoting the Sustainable Use of Contaminated Sediments and the Beneficial Reuse of Waste-Related Materials**

Team Leader: Eric Stern, Region 2

Problem Statement: Contaminated sediments pose a national problem in navigational, Superfund and solid waste programs. Remedial options are often controversial, as disposal and standard treatment options can be costly, require long-term monitoring programs, result in human and ecological exposures, and may not be widely accepted by local communities. Since 1994, EPA Region 2 has been working with federal and state partners (U.S. Department of Energy, U.S. Army Corp of Engineers, and the New Jersey Department of Transportation) on innovative sediment decontamination technologies with beneficial use applications. What makes these technologies innovative is the production of beneficial use end-products such as cement, soils, and light-weight aggregates.

The Action Team's primary objective is to expand the application of the ongoing Region 2 work to create a sustainable multi-media recycling program based on innovative decontamination technologies that manufacture high-value, beneficial use products.

**6. Lead Paint Remediation in Dwellings**

Team Leader: Maggie Theroux, Region 1

Problem Statement: Lead is a toxic metal that may cause a range of health effects, from behavioral problems and learning disabilities, to seizures and death. Children 6 years old and under are most at risk. Exposure to lead usually occurs due to the presence of deteriorating lead-based paint (LBP), lead contaminated dust (particularly from renovations), and lead-contaminated residential soil. To achieve better and faster environmental results with the lead paint problem, the Lead Paint Action Team found that innovative technology could help reduce lead exposure and lower the cost of abatements.

The Action Team has three objectives: (1) the development of simple, inexpensive, and sufficiently reliable detection technologies that residents and owners might use to identify the presence of lead in paint, dust, and soil; (2) the identification and/or development of efficient and cost-effective technologies for stabilizing or removing lead-based paint while minimizing the generation of lead in dust and debris; and (3) ensuring that new technologies and portable analytical instruments are incorporated in the National Lead Laboratory Accreditation Program (NLLAP) while ensuring that the standards are as protective as the standards that apply to fixed-site laboratories.

**7. Continuous Fine Particulate Monitoring**

Team Leader: Michael Compher, Region 5
Problem Statement: There is a need for near real-time fine particulate monitoring to address three environmental issues: (1) to alert the public about the quality of air (i.e., EPA's AIRNow Web site); (2) to develop quality state implementation plans (SIPS); and (3) to support ongoing fine particulate studies.

The current continuous monitoring methods do not always correlate well to the Federal Reference Method (FRM) when used across the nation. This leads to confusion for both the scientists and the public who use continuous data for fine particulate studies. It also may cause confusion for the customers of EPA's AIRNow Web site and may lead to questions about the quality of fine particulate monitoring data. In the initial phase of this project, the Action Team wanted to do an in-depth nationwide comparison of the data produced by each type of continuous fine particulate monitor to the FRM data and to collocated speciation data. The team wanted to determine if the quality of continuous data meets or exceeds predetermined acceptance criteria. If it does not, the team would like to work with the manufacturer to implement technological changes suggested by the analysis.

The Action Team has six objectives: (1) statistically determine and quantify the differences between the continuous method and the FRM method throughout the year with current data; (2) compare the data to available speciation data; (3) determine whether the monitoring data meets or exceeds the quality acceptance criteria (developed); (4) determine which areas in the United States meet the data quality acceptance criteria; and (5) modify the monitoring methods in areas where the data quality acceptance criteria are not met.

**8. Coal Gasification**

Team Leaders: Robert Wayland and Lorie Schmidt, OAR

Problem Statement: One of the most challenging problems the U.S. economy faces is generating electricity from coal in an environmentally sustainable way. Currently, over 50 percent of U.S. electricity generation is derived from coal, and this percentage is unlikely to go down given that the United States has 25 percent of the world's proven coal reserves. Generating electricity from coal also has significant environmental consequences. In the United States, coal burning is responsible for approximately 66 percent of the $SO_2$ emissions, 20 percent of the $NO_x$ emissions, and over 33 percent of the mercury emissions. Integrated Gasification Combined Cycle (IGCC) is one of the most promising technologies to meet the challenge of generating electricity from coal in an environmentally sustainable way.

The Action Team has four objectives: (1) evaluate the environmental consequences of IGCC as a means of producing electricity from coal as compared to other methods of producing electricity from coal and include an assessment of costs, reliability, and efficiency; (2) identify and evaluate options for federal and/or state government action to address cost barriers to initial commercial deployment of IGCC for electricity generation from coal; (3) explore whether options should address carbon capture-ready technology and carbon sequestration opportunities; and (4) evaluate federal environmental regulations to identify options for decreasing regulatory barriers to and providing incentives for IGCC.

**9. Improved Pesticide Application Equipment to Reduce Spray Drift**

Team Leaders: Jay Ellenberger and Norman Birchfield, OPPTS, and Gregory Sayles, ORD

Problem Statement: The application of pesticide sprays usually results in the formation and downwind movement of very small spray droplets of the pesticide, which can drift with air currents from the intended target sites (e.g., crop fields) and deposit on nearby sensitive sites, such as suburban developments, endangered species habitats, and water bodies, resulting in risks

of adverse effects to humans and/or the environment. The magnitude and complexity of the problem is significant. The EPA Office of Pesticide Programs estimates 500 million pounds of pesticides are applied annually to U.S. agricultural land to benefit crop production, but 3 percent, approximately 15 million pounds, may drift to and deposit on unintended sites. A number of technologies offer the potential to reduce the amount of spray drift from pesticide applications. The technology challenge is to verify the performance of drift reduction technologies (DRTs) that significantly reduce pesticide spray drift and to increase the use of such technologies by agricultural pesticide applicators.

The Action Team has three objectives: (1) verify DRTs' performance; (2) incorporate incentives for using verified DRTs as drift mitigation; and (3) increase the use of these verified DRTs in the United States to reduce spray drift and the associated inadvertent pesticide exposures and risks.

**10. Rapid Detection of Microbial Contamination of Water: Application of Molecular Technologies to Source and Potable Water Monitoring**

Team Leader: Keya Sen, OW

Problem Statement: Waterborne pathogens continue to contaminate drinking water supplies and cause waterborne disease outbreaks despite current regulations designed to prevent and control their spread. Annually, the Centers for Disease Control and Prevention estimates that pathogen-infected drinking water results in about a million new cases of illness and about a thousand deaths. EPA currently regulates two indicators of microbiological drinking water quality: total coliform and turbidity. Concerns about using indicator organisms for monitoring water quality include: (1) poor correlation between indicators and the presences of pathogens because there is a great diversity of microbial pathogens; and (2) long delays in obtaining results thereby causing a time lag between the occurrence of the contamination event and its detection to be able to safeguard consumer health. Therefore, "rapid" or "near real-time" quantitative analytical methods are needed that can specifically detect a broad array of microorganisms.

The Action Team has four objectives: (1) identify innovative molecular detection technologies that demonstrate the greatest potential for environmental application; (2) identify research gaps in adapting molecular technologies for consideration by ORD's Research Program, including the STAR and SBIR Extramural Programs, and American Water Works Research Foundation (AWWARF); (3) provide technical support for the expansion of methods; and (4) quantify economic and environmental benefits for the use of these methods.

**11. Urban Runoff**

Team Leader: Charles App, Region 3

Problem Statement: Urban runoff is the third leading cause of stream impairment in EPA Region 3, behind agriculture and resource extraction, with over 4400 miles of streams impaired. Nationally, urban runoff is identified as a leading cause of stream impairment, with every state affected and almost 35,000 miles impaired. With growth and development, this issue will only become more important in the future. More cost-effective and sustainable techniques of dealing with urban runoff are needed. Many small Municipal Separate Storm Sewer System Operators (MS4s) have concerns how to best achieve their National Pollution Discharge Elimination System requirements to develop and implement storm water management plans that protect

water quality. The “real world” performance of many commonly used best management practices (BMPs) is not known.

The Action Team is trying to address some of the MS4 concerns with the following efforts: (1) conduct a national assessment of well-performing municipal storm water management BMP programs in impaired urban watersheds; (2) select one of the case study sites and conduct a field pilot project to enhance existing BMPs to improve water quality; and (3) disseminate environmental results by conducting in-stream water quality monitoring and conduct outreach to MS4s and States about performance.

## b. Action Team Standard Operating Procedures (SOPs)

February 2007

The Environmental Technology Council (ETC) selects priority environmental problems through a process which involves Regional Offices, Program Offices, and outside stakeholders. After a problem has been selected, the ETC will ask the proposing Office(s) to identify the co-leaders, the Champion, and potential members for the Action Team. The importance of a problem will be demonstrated by the support that it receives from the offices. The SETO and the ETC will officially authorize an Action Team after it approves the Action Plan and the selection of the co-leads and the Champion.

**Action Teams:**

- Team Champion: Before forming a team, a DRA or DAA should accept the position of champion for the team. The champion is an advocate for the team and actively assists the team in securing resources and dealing with problems that they encounter. A team cannot officially be formed without a Champion.

- Team Leaders: There should be at least two and preferably three co-leads from ORD, a Program Office, and a Regional Office. The ETC must approve the selection of the co-leads. If, at a later date, one or more of the co-leads of an Action Team cannot perform that function, the SETO and ETC will work with the relevant Agency offices to find a replacement.

- Action Plan: At the first meeting, the team should begin work on its Action Plan. By the second meeting, it should be completed and submitted to the ETC, the SETO's Office, and the Champion for approval. Thereafter it should be updated twice a year (October and April) unless there are significant changes. Action Plans will be posted on the ETC web site so it is important to keep this information up to date.

- Agency Goals: In the Action Plan, the team co-leaders need to identify the relevant Agency goal which their team will help to achieve through technology deliverables. Example: EPA GPRA Goal #4 – Healthy Communities: 1) Eliminate lead-based paint as a hazard and 2) Eliminate all instances of children with elevated blood lead levels (EBLs).

**Team Meetings:**

- Regular Meetings: Action Teams should set a regular meeting date and time, such as the second Wednesday of the month at 3pm. Regular meetings keep members involved and committed.

- Minutes and Action Items: Action Team Leaders should request administrative support for the taking of minutes and action items, with the name of the team member responsible for each item. The previous meeting's minutes should be distributed before the meeting for corrections. At the beginning of each meeting, the team leader should review the minutes and action items. An electronic copy of the approved minutes and action items should be forwarded to the SETO's office and Team Champion.

**Team Leaders:**

- Performance Standards: The performance standards in the PARS agreement for the co-Leaders should contain a critical job element which relates to their role as team leaders.

**Members:**

- Performance Standards: The performance standards in the PARS agreement for the Team Members should list as an activity their role as a team member under a broader critical job element such as "program management". Their supervisors should be aware of the commitment and reward the effort.

**ETC Meetings:**

- ETC Representation: Every Action Team Leader or co-Leader should attend the ETC meetings.

**Reporting:**

- Progress Reports: The Action Team progress reports are due in October and April to the SETO's office with a copy to the Team Champion.

- Team Champions: The Team Leader or co-Leaders should update the Team Champion on a quarterly basis.

- Annual ETC Team Presentations: Once a year, the ETC will have a face to face meeting, and the Team Leaders will give presentations on each team's progress and the lessons learned. The meeting should be incorporated with the ORD Science Forum.

**Links to Other Programs:**

**SBIR:**

- Topics: Action Teams should submit their topics to the SBIR Program Managers by December 15th.

- Awards: If an Action Team places a topic(s) in EPA's Small Business Innovation Research (SBIR) program's solicitation then the team should be prepared to participate in the relevancy review of the proposals submitted under their topic(s). If an award is given for their topic, then the team should hold regular conference calls with the technology developer to ensure that the research is tackling the environmental problem.

**ETV:**

- Verifications: If a verification is needed for a technology then team members should interact with the ETV program. At the end of the verification, the team should submit a report to the ETC and the SETO's office.

**FTTA:**

- Technology Partnerships: EPA provides opportunities to transfer Federal technologies into the marketplace and to collaborate on environmental R&D projects with outside entities such as industry, consortia, academia, trade associations, and State and local agencies to address environmental issues. The Federal Technology Transfer Act (FTTA) provides a mechanism for these cooperative R&D partnerships.

- Agreements: Action Teams should consider using these types of arrangements to achieve their goals. When a Cooperative Research and Development Agreement (CRADA) or other partnership is formed, the team should submit a report to the ETC and the SETO's office.

## 3. ETC Brown Bag Lunch Seminars

Starting in 2004, ETC has sponsored a series of brown bag lunch seminars describing various environmental technology programs. Several of these presentations included progress reports from ETC Action Teams, as well as information on EPA technology support programs such as the Small Business Innovation Research (SBIR) Program and the Environmental Technology Verification Program (ETV). Background materials from each of these brown bag lunch seminars are available at http://cluin.org/meetings/etc. The seminars are listed below.

2006

- May 11, 2006: Overview of EPA Initiatives for Deployment of Integrated Gasification Combined Cycle (IGCC)*
- April 20, 2006: Project for Encouraging the Use of Pesticide Drift Reduction Technologies*
- March 9, 2006: Bioremediation ─ From the Lab to the Field
- January 26, 2006: Overview of the U.S. EPA's Endocrine Disruptors Research Program

2005

- December 15, 2005: Bioengineering for Pollution Prevention Through Development of Biobased Energy and Materials
- December 1, 2005: Greening the Built Environment Through Specs and Standards
- October 6, 2005: Government Actions and Innovation in Clean Energy Technologies: Lessons from Case Studies
- August 25, 2005: Building Partnerships ─ the Collaborative Science and Technology Network for Sustainability
- August 11, 2005: Strategic Environmental Research and Development Program
- July 14, 2005: EPA's P3 Award: A National Student Design Competition for Sustainability
- June 30, 2005: The Environment and Energy
- May 19, 2005: Waste Program Monitoring Technology Needs and the 21M² Effort
- May 5, 2005: Peaking Oil Production & the Environment*
- April 21, 2005: Clean Air Technology Center (CATC)
- April 7, 2005: U.S. EPA Arsenic Technology Demonstration Program*
- March 24, 2005: U.S. EPA Arsenic Technology Demonstration Program*
- March 10, 2005: ECOS and ITRC
- February 24, 2005: Green Chemistry
- February 10, 2005: Environmental Technology Council Briefing: U.S. EPA SITE Program
- January 13, 2005: Technology Transfer: CRADAs, Patents and Licensing

2004

- December 16, 2004: Small Business Innovation Research (SBIR) Program
- December 2, 2004: Nanotechnology: What Is It? Are There Associated Environmental Concerns?
- November 2, 2004: ENERGY STAR Overview
- October 21, 2004: EPA REACHIT Database
- October 7, 2004: EPA and Green Building
- September 23, 2004: Environmental Technology Verification Program

* ETC Action Team presentations

## 4. National Advisory Council for Environmental Policy and Technology (NACEPT)

### a. Request to Create NACEPT Subcommittee on Environmental Technology

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 23 2004

**MEMORANDUM**

**SUBJECT:** Establishing an Environmental Technology Council

**FROM:** Paul Gilman
Agency Science Advisor

**TO:** Assistant Administrators
Associate Administrators
Regional Administrators
Deputy Assistant Administrators
Deputy Regional Administrators
Science Policy Council

As directed by Governor Leavitt in the attached memorandum, I am taking steps to establish an Environmental Technology Council. Some of you have participated in earlier discussions of this subject through the Innovation Action Council and other venues. My goal is that the Council quickly establish a network of people inside and outside the Agency who will engage in robust information exchange and problem solving.

So that we can move forward to address Governor Leavitt's requests, I am asking that each Office and Region provide:

- The name(s) of up to two representatives to the Council (by June 30);
- Up to three prioritized technology/problem opportunities that you would like the Council to address (by July 31); and
- Any recent applications of innovative technologies, especially those benefiting from EPA's support programs, that you feel are making a difference in moving to a new level of cost-effective environmental protection (by July 31).

The Council will discuss the problem/technology opportunities submitted and recommend to the Science Policy Council a subset on which to begin work. I think our objective should be to identify opportunities that link as closely as possible to our Agency goals and the Administrator's 500-day plan.

I believe it will be most productive if at least one of your Council representatives is a manager at the Division or Deputy Office Director level. They will have the opportunity

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## b. Charge to the Subcommittee on Environmental Technology

**Draft Framework for Developing Recommendations on U.S. EPA's Environmental Technology Programs**

Without innovative technology, most of the environmental gains that we have achieved would not have been possible. The greatest environmental gains and cost efficiencies come from technologies that use fewer resources, reduce the use of toxic substances, and produce less waste in producing products and providing services.

Governor Leavitt has established a vision for EPA to move to a new level of more efficient, effective and collaborative environmental management. He has identified four cornerstones of this effort: better use of science and technology, using market mechanisms, collaboration and networking, and managing for results. These elements should work together to bring about needed environmental progress.

EPA must continue to think strategically about how innovative technology can lead to better and more cost effective environmental management. EPA needs to particularly focus on the role innovative technology can play in moving to a model of environmental protection built on the principles of stewardship and sustainable development, which will allow environmental, economic, and social goals to be achieved.

EPA should enable and support the role of the private sector in technology development. The Agency should have a strategic approach to designing its programs and should concentrate on leveraging its programs and activities to facilitate the development of innovative technologies, and should be targeting barriers that discourage or hold back their adoption.

Although EPA is not likely to receive significant additional funding for any new technology activities, the Subcommittee should not feel constrained in its thinking. The Subcommittee should rely on its collective experience and carefully considered assessments to frame its recommendations.

The Subcommittee should bear two overarching questions in mind as it formulates its recommendations: 1.) How can EPA better optimize it existing environmental technology programs to make them as effective as possible, and 2.) What other environmental technology programs and activities should EPA initiate to take advantage of opportunities it may be missing.

There are several specific areas where NACEPT can advise the Agency on its environmental technology programs:

1. Coordination and Communication – EPA's technology support programs should be transparent to its stakeholders and coordinated effectively across the Agency. Although most of EPA's technology support programs are in one office—the Office of Research and Development—valuable information, incentive, and advocacy programs exist in other offices as well.

    - In its Report to Congress on a One-Stop-Shop for Coordination of Programs Which Foster Development of Environmental Technologies, EPA committed to creating an

Environmental Technology Opportunities Portal that will lead users to information on all of EPA's technology programs through an integrated "one-stop-shop." This portal became operational on December 31, 2003.

*In addition to the information provided now, what other information should be available through this web portal?*

- The Report to Congress also committed to creating an Environmental Technology Council to coordinate programs across the Agency.

  *What functions should such a council have to ensure that it provides value added? How should it measure progress and success?*

- U.S. EPA Region I has developed an effective program called the Center for Environmental Industry and Technology that provides assistance to technology developers and to technology users seeking solutions to problems.

  *If this program is replicated in other Regions, what kinds of assistance should be available through these Centers? Would a Technology Assistance Center at Headquarters be valuable as a central EPA point of contact and as a formal link to other Federal, State, and Tribal organizations with environmental technology programs? What should its functions be?*

2. Leveraging Existing Programs – there are opportunities to encourage the development and adoption of innovative technology by leveraging existing programs.

   - EPA has technology support programs targeted to particular needs, such as technology verification and support for small business development.

     *How can EPA ensure that these programs are operating in the most cost-effective way to achieve measurable environmental results?*

   - In the past, funding for the construction of wastewater treatment projects included incentives for innovative technologies.

     *How can EPA best work with State and Tribal Agencies and private companies to facilitate "demand pull" for new technologies through connections, early trials, adoption and acceptance? In addition to water and wastewater construction projects, what other opportunities—such as air monitoring networks—might exist to steer the EPA grant funds that State and Tribal Agencies receive toward new technologies? How can EPA advocate and support "purchasers of first resort" for commercially available new technologies?*

   - EPA and some State Agencies have had programs offering incentives to companies not in compliance that encourage them to implement pollution prevention solutions—which often involves the adoption of innovative technologies.

     *How can EPA work more effectively with State and Tribal Agencies to make information on cost effective innovative technologies available to firms that aren't in compliance,*

*particularly small and medium sized firms? In addition to the enforcement offices in EPA, State, and Tribal Agencies, what other offices should be involved? How can information on enforcement actions—and potential customers—be effectively conveyed to technology developers and suppliers? Which industry associations should EPA, State, and Tribal Agencies engage in these efforts?*

- Since the market for environmental technologies is generally low growth, the greatest opportunities for the commercialization and adoption of innovative technologies may come through taking advantage of "dual use" technologies that are being developed for other markets.

  *How can EPA engage companies in defense, health science, food science and other industries that are developing technologies which might also have environmental applications?*

- A number of organizations, such as the Northwest Environmental Business Council and the U.S. Department of Commerce, have mandates to serve as "retail networks" for companies that produce and market environmental technologies both domestically and internationally.

  *What Federal, State and Tribal organizations should EPA partner with to identify technology needs, to get best practices introduced, to encourage early adopters, and to provide assistance in gaining acceptance?*

3. Removing Regulatory Barriers – regulatory barriers often exist that unintentionally restrict the use of innovative technology.

   - While some "barriers" may be necessary requirements to protect human health and the environment, the way regulations are structured can encourage or discourage innovation.

     *What additional research should EPA sponsor—and with which organizations—to evaluate how regulatory, voluntary, and information-based approaches can best be used to encourage innovation and achieve environmental results?*

   - At the State and Tribal level, differing regulatory requirements may impede the adoption of innovative technologies. The Interstate Technology Research Council (ITRC) is working with the States to establish common data requirements for the permitting of remediation technologies.

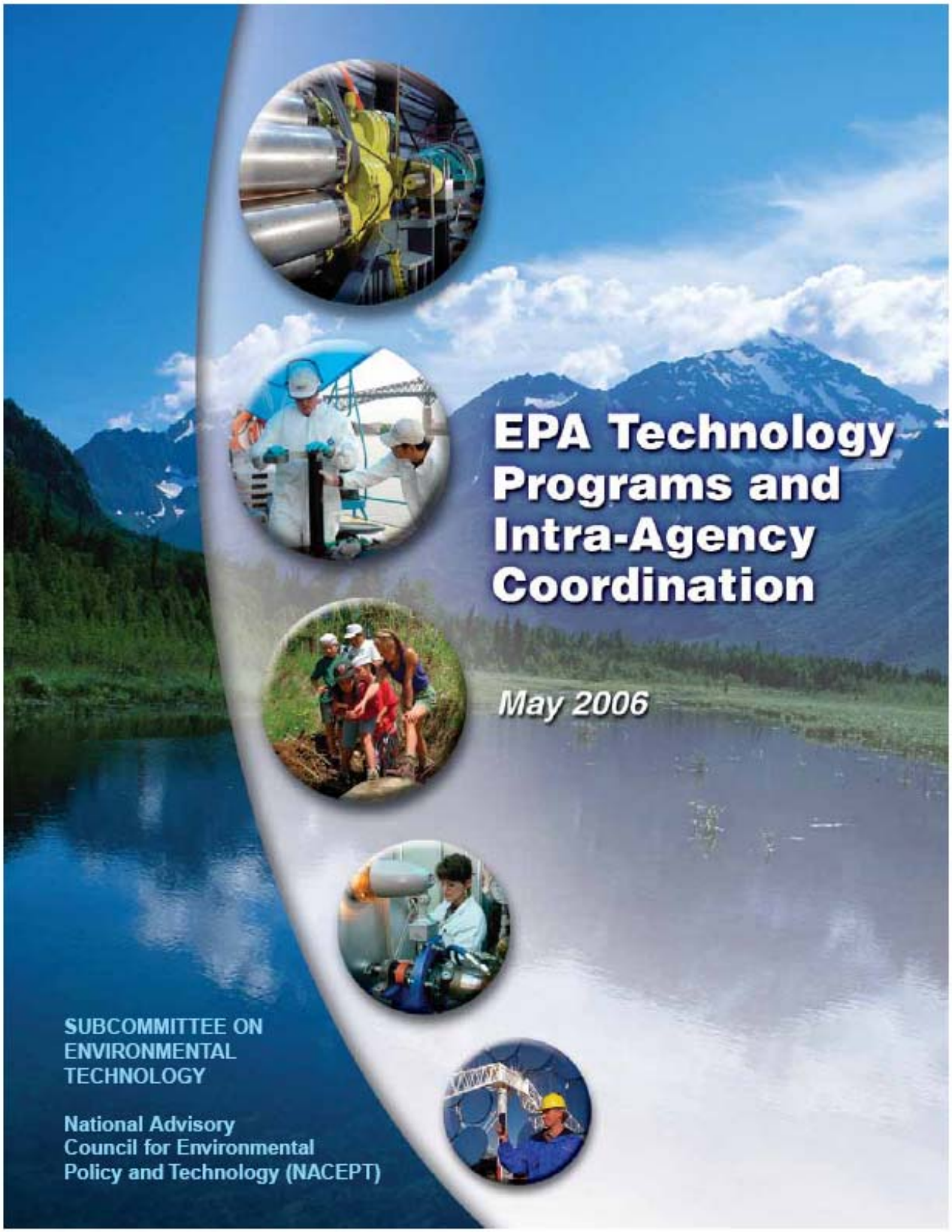
     *How should this, and similar programs—such as the Technology Acceptance and Reciprocity Partnership—be expanded to help remove regulatory impediments to the adoption of other environmental technologies?*

4. Providing Economic Incentives – economic incentives can encourage the development and use of innovative technology.

   - Up front capital costs often deter businesses from installing greener technologies that may be more environmentally beneficial, and in some cases, more cost effective in the long term.

*In addition to investment tax credits, what other economic incentives should be evaluated and encouraged? Which organizations should EPA partner with to conduct research in this area?*

c. First Report: "EPA Technology Programs and Intra-Agency Coordination" (available at www.epa.gov/etop)



d. Administrator's Response to First Report

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 19 2006

THE ADMINISTRATOR

Mr. John L. Howard, Jr.
Chair
National Advisory Council for Environmental
Policy and Technology
Vinson & Elkins, LLP
2801 Via Fortuna, Suite 100
Austin, Texas 78746

Dear Mr. Howard:

I thank the National Advisory Council for Environmental Policy and Technology and its Environmental Technology Subcommittee for the thoughtful and comprehensive recommendations in the report titled *EPA Technology Programs and Intra-Agency Coordination.* These recommendations have stimulated the U.S. Environmental Protection Agency to examine how best to promote the use of innovative technology in carrying out its mission.

You will be pleased to learn that the Subcommittee's report has already helped promote change and achieve positive results. The EPA Technology Development Continuum chapter is a valuable resource as EPA evaluates its programs, as well as an information source for technology developers and users seeking guidance and support from EPA. The Agency has already used the information to restructure the one-stop-shop Environmental Technology Opportunities Portal on its Web site to provide a coherent roadmap of EPA's technology programs.

The report's 15 recommendations were reviewed by the Agency's Science Policy Council. The SPC also sought input from the Environmental Technology Council on how to respond to each of the recommendations. The ETC considered not only the recommendations themselves, but also how they could be implemented and sustained. As a result, the SPC approved four recommended actions that essentially embrace the whole of the NACEPT report recommendations:

1. Establish a Senior Environmental Technology Officer who will be the focal point for key activities recommended in the report like establishing priorities, chairing the ETC, facilitating cross-agency coordination and information sharing, working with the business community and other stakeholders, and developing metrics for measuring effectiveness.

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2. Establish the Environmental Technology Council as a core Agency activity with more senior-level membership accountable for results.

3. Establish a Regional Environmental Technology Advocacy Network comprised of a technology advocate in each region to identify opportunities to use technology to achieve better results, share information within the Agency and with stakeholders, serve as liaison with technology programs across the Agency, and serve as member of the ETC.

4. Create an Environmental Technology Verification and Assessment Staff coordinated by the National Risk Management Research Laboratory to provide enhanced technology support to the SETO and the rest of the Agency on issues like technology verifications, state-of-the-art assessments, technology development collaborations, and encouraging sustainability.

We have decided to move forward to implement these recommendations. It is important that EPA increasingly be engaged in promoting and facilitating cost-effective solutions to environmental challenges. Obviously, the implementation of these recommendations has resource implications that must be taken into consideration as we define the specifics of our actions. Dr. George Gray, EPA Science Advisor and Assistant Administrator of the Office of Research and Development, will lead our implementation efforts. Dr. Gray and I will keep the Council informed as we move forward.

I understand that a second report with recommendations from the Environmental Technology Subcommittee will be delivered early next year. We look forward to working with NACEPT as we consider the recommendations in that report.

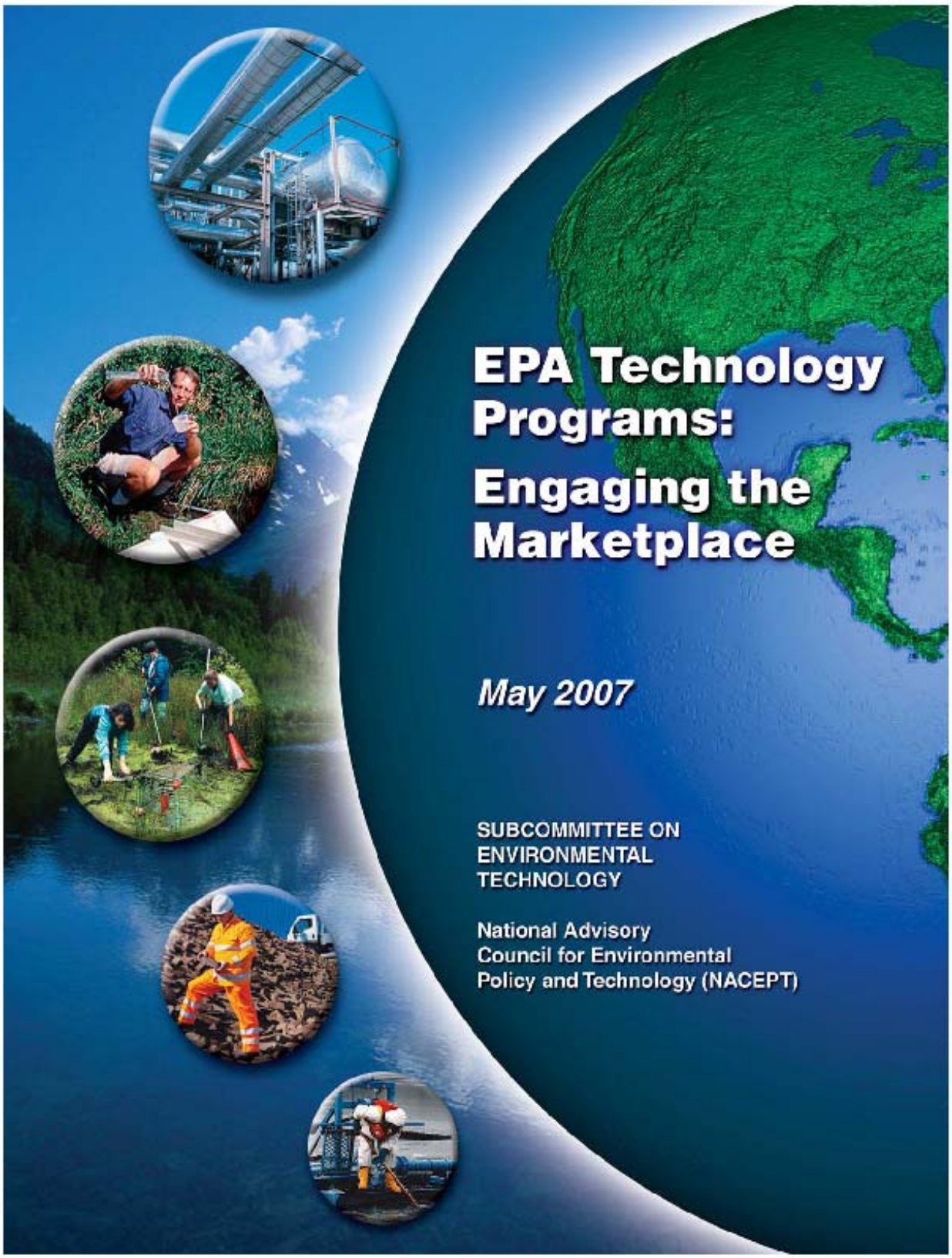
Again, my thanks to NACEPT and the Technology Subcommittee for its advice and assistance in helping EPA meet its commitment to promote innovative technology in carrying out its mission.

Sincerely,

Stephen L. Johnson

cc: Marcus Peacock, Deputy Administrator
George Gray, Assistant Administrator, Office of Research and Development
Rafael DeLeon, Director, Office of Cooperative Environmental Management
Phil Helgerson, Chair, Environmental Technology Subcommittee

e. Second Report: "EPA Technology Programs: Engaging the Marketplace" (www.epa.gov/etop)



## 5. Senior Environmental Technology Officer (SETO) Position Description

Draft, 1/4/07

# Position Description for the EPA Senior Environmental Technology Officer (SETO)

The key to achieving more coordinated, sustained, and robust attention to environmental technology within the Agency and more substantive and fruitful engagement with other agencies and the private sector is the creation of a Senior Environmental Technology Officer (SETO). The SETO is located in the [Office of the Administrator] and reports to the [Agency's Science Advisor].

The SETO is the Agency's central point and advocate for environmental technology-related issues. The SETO works with senior management across the Agency, with internal councils, and with outside advisory committees to carry out this function. The SETO has authority to convene these and other individuals and groups from inside and/or outside the Agency to carry out this responsibility. The SETO uses the Environmental Technology Research and Development Continuum (Technology Continuum) as a conceptual tool to coordinate and evaluate the use of Agency programs and resources to achieve the most effective technology development and deployment.

The SETO must have knowledge of Agency technology programs and needs and be able to: (i) coordinate Program and Regional Office activities to assure that redundancies are avoided and resources are appropriately allocated to address the most serious problems requiring technological fixes, (ii) provide the Administrator with knowledgeable advice on domestic and international technology issues and policies, (iii) open communication channels and partnership opportunities to all outside entities whose assistance can further Agency technology development and deployment goals, and (iv) assure that outstanding communication functions operate across the entire Agency to facilitate robust information flow on effective technology opportunities of all types.

The SETO's roles and functions include, but are not limited to, the following:

A. Senior Officer and Advocate for Technology within EPA
   1. Assures that technology programs across the Technology Continuum support the Agency's Strategic Plan and solution of its highest priority problems that require technology development and deployment
   2. Seeks opportunities to add technology activities and metrics to all program office sections in the Strategic Plan, supports and coordinates those activities, and reports on environmental results
   3. Assists Agency management and staff in moving innovative environmental technologies along the Technology Continuum
   4. Provides advice to the Science Advisor, Administrator, and other managers
   5. Member of Science Policy Council and Innovation Action Council
   6. Acts as the primary Agency external spokesperson for environmental technology including providing advice to Congress

B. Promotes and manages the EPA infrastructure related to developing and utilizing innovative environmental technologies to solve the most important environmental problems
    1. Chairs the ETC and provides oversight of the Action Teams
        a. identifies, using both Agency staff and outside stakeholders, significant environmental problems requiring new or improved technologies
        b. facilitates the creation and operation of Action Teams
        c. supports the selection of senior management Champions for and their interactions with their respective Action Teams
    2. Provides leadership to the Regional Environmental Technology Advocates Network
    3. Utilizes and works to enhance the capabilities of the Environmental Technology Verification and Assessment Staff
    4. Manages a small staff and resources that support these activities
    5. Creates and uses an external Technology Advisory Board to advise the SETO and the Agency on priority environmental problems needing technology breakthroughs, market place realities, communication issues, and partnership opportunities
    6. Develops and is responsible for keeping current a central, consolidated, and simple clearinghouse for commercial-ready technologies and associated performance data to assist purchasers in getting the best technology for their particular situation

C. Establishes partnerships both inside and outside the Agency to bring environmental technologies to market and into utilization by developing joint programs, projects, and activities with:
    1. Other Federal agencies
    2. Business organizations—including technology developers, vendors, venture capitalists, industry associations, users, and others
    3. NGOs and other non-profit organizations, both domestic and international
    4. State entities of all types, including State small business development agencies, as well as CalPERS and other State funds that invest in clean technology
    5. The Environmental Council of the States (ECOS) and other State organizations to engage States in all aspects of technology implementation and support State environmental technology innovation programs such as TARP and ITRC
    6. Government agencies in other countries and international organizations

D. Creates and manages communication mechanisms within the Agency and with outside individuals and entities that
    1. Coordinate information on EPA environmental technology development and deployment activities with those of outside organizations
    2. Provide communication leadership by facilitating the transmission of information and data to the wide diversity of people outside the Agency who need it for decision-making purposes
    3. Oversee communication and outreach activities, particularly the quality of the Agency's various technology web sites, to achieve outstanding information flow to the entire technology development, commercialization, and purchasing communities

4. Represent the Agency as a technology champion and create external events and communication tools that highlight successful technology commercialization and uses
5. Establish methods to better communicate available technologies and their performance, including working with Agency programs to populate a database with this information and keep it current

E. Enhances Agency effectiveness in furthering environmental technology development and deployment by
    1. Providing partnership coordination through a working knowledge of incubators, markets, financial resources like venture capital organizations, regulatory agency needs, leadership companies, regulatory tools, interests of non-profits, States taking leadership roles in specific areas, and other partners who might contribute to successful development and marketing of technologies
    2. Educating staff about the issues faced by technology developers, including creating a list of Frequently Asked Questions about technology development and partnering
    3. Guiding and facilitating the ETC in coordination of technology programs, collecting and disseminating technology-related information, and developing general EPA technology policy
    4. Ensuring that the ETC is an intra-EPA forum for technology discussions
    5. Creating recognition programs for staff who take risks to use environmental technologies that achieve results
    6. Developing and being responsible for keeping current a central, consolidated, and simple clearinghouse for commercial-ready technologies and associated performance data to assist purchasers in getting the best technology for their particular situation

## 6. Regional Technology Advocates (RTAs)

### a. List of RTAs

September 5, 2007

Region 1: Maggie Theroux
Environmental Technology Specialist
Office of Environmental Stewardship
Assistance and Pollution Prevention Office
(617) 918-1613
Theroux.maggie@epa.gov

Region 2: Andrew Bellina
RCRA Senior Policy Advisor
Division of Environmental Planning and Protection
(212) 637-4126
Bellina.andrew@epa.gov

Region 3: Charles App (pending selection of HSTL)
(215) 814-2757
App.charles@epa.gov

with support from Regional Science Council members of each division

Region 4: Latoya Miller plus RTA Team
Innovations Coordinator
Office of Policy and Management
(404) 562-9885
miller.latoya@epa.gov

Region 5: David Macarus
Regional Science Liaison to ORD
Central Regional Laboratory
(312) 353-5814
macarus.david@epa.gov

Region 6: Myron Knudson
Senior Policy Advisor to the Regional Administrator
Regional Administrator's Office
(214) 665-3136
Knudson.myron@epa.gov

Region 7: Brenda Groskinsky
ORD Science Liaison for Region 7
Office of the Regional Administrator
(913) 551-7188
Cell: (913) 551-9188
groskinsky.brenda@epa.gov

Region 8: Patti Tyler (pending recruitment of STL)
EPA Region 8 Science Advisor
Office of the Regional Administrator
(303) 312-6081
Cell: (303) 818-3130
tyler.patti@epa.gov

Region 9 Michael Gill (Point of Contact)
ORD Superfund and Technology Liaison to Region 9
Superfund Division
(415) 972-3054
gill.michael@epa.gov

Tom Huetteman (Management Contact)
Brenda Bettencourt (Laboratory Director)

Region 10: John Barich
Superfund and Technology Liaison
Office of Research and Development/Region 10
Office of Environmental Assessment
(206) 553-8562
barich.john@epa.gov

Ann Williamson (Alternate)

## b. RTA Position Description (PD)

draft - 2-22-07

The Regions are EPA's front line in dealing with environmental technology problems in the field and with environmental technology implementation issues at various stages of development and deployment. Making sure that problems and technologies are appropriately connected requires knowledge and advocacy. To accomplish this, the Agency will create a Regional Environmental Technology Advocacy Network (RETAN) which will consist of a Regional Technology Advocate (RTA) in each Regional Office.

The RETAN will have the following structure and functions:

- Each Region will appoint a Regional Technology Advocate (RTA)
- The RTAs will meet periodically by conference call to share experiences and information and to coordinate regional environmental technology policy implementation
- The SETO will coordinate and facilitate the activities of the RETAN

The RTA's roles and functions include, but are not limited to, the following:

- Works with the RA, DRA, and other Regional managers to identify and prioritize environmental problems important to the Region for which technology might be a solution and to inform them and obtain their views about technology-related issues, policies, and practices
- Represents the Regional Office on the Environmental Technology Council (ETC)
- Facilitates Regional Office participation in ETC Action Teams and their verification activities—e.g., by co-leading and/or finding Regional Office co-leads, members, and Champions for Action Teams
- Works with Regional staff to facilitate the use of new technologies as a primary tool to improve environmental performance and solve problems
- Acts as the primary Regional contact for technology developers, vendors, and users, and for State and local technology permit writers
- Communicates with States to respond to their technology information and policy needs and learn from their areas of expertise
- Coordinates routinely with Regional counterparts and through quarterly meetings with the EPA Senior Environmental Technology Officer (SETO)
- Identifies Regional topics for the Small Business Innovation Research Program (SBIR), reviews the proposals, and tracks the progress through conference calls with technology developers funded for those topics
- Seeks technology solutions to achieve environmental results in all Regional media programs and enforcement
- Promotes the use of Supplemental Environmental Projects (SEPs) as a means to demonstrate environmental technologies, especially those critical to ETC Action Teams
- Identifies and addresses barriers to the movement along the EPA Technology Development Continuum (available at www.epa.gov/etop) of specific environmental technologies that have come to the attention of the Region
- Keeps the Regional staff and States informed of the verifications performed by ORD/NRMRL's Environmental Technology Verification and Assessment Staff (ETVAS)

## 7. Environmental Problem Identification Questionnaire

EPA United States Environmental Protection Agency

# Environmental Technology Council

### Instructions for Using the Environmental Problem Identification Questionnaire

The key function of the Environmental Technology Council (ETC) is to identify the most important environmental problems on which to work. Everything else that the Council does follows from the identification of these problems.

This questionnaire is a tool to enable Regional Technology Advocates (RTAs), Program Office ETC members, and others to pro-actively identify the most important environmental problems. It is divided into two parts. **Screening Level One** emphasizes explaining how a problem fits within the top priorities of the Administrator and the Regional and Program Offices. **Screening Level Two** brings in factors such as stakeholder interest and technology availability.

One way to use this questionnaire is to interview managers and others who have an overview of an environmental area, for example, as a program manager, branch chief, division director, office director, Deputy Regional Administrator (DRA), Deputy Assistant Administrator (DAA), or Regional or Assistant Administrator. Within a Regional or Program Office, all of the problems that are identified could be reviewed and ranked by the DRA or DAA. An alternative would be to start with the DRA or DAA and get their general descriptions of the most important problems and then go progressively down in the organization to get more specific aspects that could be addressed by the ETC.

Personal interactions are essential to get to the heart of a problem. Sometimes two interviews might be the most productive way of proceeding (e.g., a general discussion followed up by asking about the specific problems). It also would be useful to have the person interviewed and perhaps others review the completed questionnaire and make changes that will sharpen the presentation.

Please describe one problem per questionnaire. You should go into an interview with a few copies of the questionnaire. Even if a problem is ultimately not ranked as the most important, you should keep all of the problem descriptions because these other problems deserve whatever attention you can give to them.

Please fax your completed questionnaires to Paul Shapiro (FAX: 202-233-0678).

If you have any questions, please contact Paul at *shapiro.paul@epa.gov.*

EPA Technology

March 20, 2007

# Environmental Problem Identification Questionnaire

EPA United States Environmental Protection Agency

Regional Office_____ Program Office _____

**INTERVIEWER** Name_____ Tiitle_____ Date_____

## Screening Level One

**INTERVIEWEE** Name_____

Organization (Office/Division/Branch)_____

Problem Statement:_____

_____

_____

_____

Problem Ranking: Very High _____ High _____

Problem Champion (identify by name and organization, if possible)

_____

### Administrator's Priorities:

| | | | |
|---|---|---|---|
| Cleaner Air and Affordable Energy | ____ | The Global Environment | ____ |
| Clean and Safe Water | ____ | Sustainable Infrastructure | ____ |
| Healthy Communities and Ecosystems | ____ | Homeland Security | ____ |

Explain why this fits under these priority(ies) _____

_____

_____

### EPA Strategic Goals:

| | | | |
|---|---|---|---|
| Goal 1: Clean Air & Global Climate Change | ____ | Goal 4: Healthy Communities & Ecosystems | ____ |
| Goal 2: Clean & Safe Water | ____ | Goal 5: Compliance & Environmental Stewardship | ____ |
| Goal 3: Land Preservation & Restoration | ____ | | |

Explain how this fits under these goal(s) _____

_____

_____

### Regional and Program Office Priorities

Under what Regional or Program Office priority(ies) does this fit?_____

_____

_____

Explain why this falls under these priority(ies)_____

_____

_____

### Other Mandates

What other mandates are there for addressing this problem?_____

_____

_____

EPA Technology

March 20, 2007

# Environmental Problem Identification Questionnaire (Continued)

United States Environmental Protection Agency

## Screening Level Two

Who cares about this environmental problem (e.g., EPA Regions, EPA Programs, regulated communities, Federal agencies, States, local government, other stakeholders)? Please identify interested and/or affected parties by name and organization, if possible.

Does this problem present a risk for or have an impact on sensitive populations?

Does this problem fit under any regulatory requirements?

Are you aware of any technologies that could be used to address this problem? Describe these technologies, if possible.

What is the potential for success in addressing this problem given the technology status or the complexity of the problem?

To solve this problem with the proposed technology, are there potential cost reductions over the current problem resolution method(s)?

Yes___ No___ Unknown___

If yes, please describe these cost reductions.

Will solving this problem have multi-media impacts? Describe these impacts, if possible.

EPA Technology

March 20, 2007