Emerging Drivers for Cleantech:
An EPA-University and Entrepreneur Roundtable
October 26, 2009, 10 a.m. – 12:30 p.m.

10:00 – 10:15
Opening and Introductions Walter W. Kovalick Jr., Acting Deputy Regional Administrator

10:15 – 10:35
EPA's Role in Fostering Technology

10:35 – 11:10
EPA's Assets for Technology Developers and Entrepreneurs

- **April Richards:** Small Business Innovative Research Program (SBIR)
- **Valerie Blank**: Cooperative Research and Development Agreements (CRADA)
- **Maggie Theroux:** Environmental Technology Verification (ETV) Program
- **Alan Walts:** Supplemental Environmental Projects (SEPs)

11:10 – 11:30
Emerging Environmental Challenges

11:30 – 12:00
Responses to EPA Information on Demand for Cleantech

- **Allen J. Dines:** President, Midwest Research University Network
- **Dr. Kathy Banks:** Professor of Civil Engineering, Purdue University
- **Jeffery Perl:** President, Chicago Chem Consultants Corp

12:00 – 12:30
Discussion of On-Going Dialogue with EPA about Cleantech

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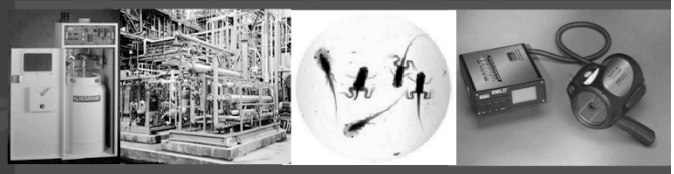
EPA's Small Business Innovation Research (SBIR) Program

April Richards

EPA-University and Entrepreneur Roundtable



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SBIR Program Overview

- 11 Federal Agencies with SBIR Programs
- Program supports Small Businesses (fewer than 500 employees) to Develop Technologies that Agencies Need
- Budget:
  - Automatic Set-Aside
  - Total of $2.3 Billion in 2009
- Phased Approach:
  - Phase I proves Technical Feasibility
  - Phase II promotes Commercialization

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EPA-NSF SBIR Collaboration

- # 2009 Phase I Projects
  - EPA received 500 proposals, 98 passed peer review, will fund ~ 40
  - NSF received 1740 proposals and will fund ~300
- 2009 Budget: EPA $5 Million, NSF $175+ Million
- Phase I Awards (6 months): EPA $70,000; NSF $150,000
- Phase II Awards (2 years): NSF $500,000, EPA $300,000
- Supplemental Funding: NSF up to $500,000, EPA up to $120,000

- All EPA Topics covered by National Science Foundation (NSF)
- GOAL: Commercialize more Environmental Technologies

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EPA SBIR Solicitation Topics - 2009

- Green Building
- Innovation in Manufacturing
- Nanotechnology
- Greenhouse Gases
- Drinking Water and Water Monitoring
- Water Infrastructure
- Monitoring and Control of Air Pollution
- Biofuels and Vehicle Emission Reduction
- Waste Management and Monitoring
- Homeland Security

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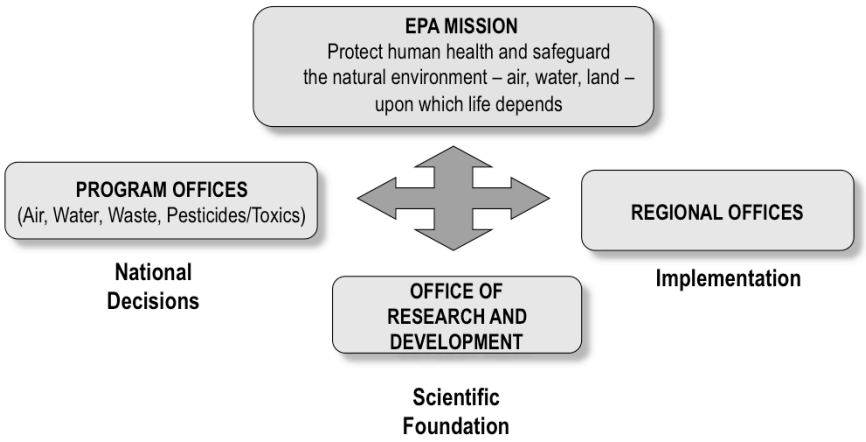
For More Information…

- Next SBIR Phase I Solicitations:
  - 1st NSF Phase I: Closing December 2009
  - EPA Phase I: Closing May 1, 2010
  - 2nd NSF Phase I: Closing June 2010
- NCER SBIR website: www.epa.gov/ncer/sbir
  - 2009 Phase I Solicitation (now closed)
  - Searchable database of all funded projects
  - SBIR Success Stories
- Contacts
  - Jim Gallup, Program Manager (202) 343-9703
  - April Richards, Deputy Program Manager (202) 343-9836

EPA's FTTA Program

- Focus of "technology transfer" is to get technologies developed by the Federal government into the marketplace
- Managed by the Office of Research and Development for EPA



FTTA Technology Transfer

- Collaborate with outside entities & assist transfer of Federal technologies
- Protect intellectual property through patents and licenses

- *Cooperative Research and Development Agreements*: Technologies can be co-developed or jointly improved
- *Material Transfer Agreements*: Loan or donation of research materials from one party to another
- *Outside User Agreements*: Non-Federal parties can use EPA facilities for independent research for a fee
- *Licenses*: Technologies developed in EPA labs can be transferred to the partner for further development and/or commercialization

FTTA Case Study

- Biomass Concentrate Reactor
  - Co-developed technology with University of Cincinnati
  - Effective for treatment of environmental media where high biomass retention is desired for biodegradation
- Demonstrated simple, economical treatment of MTBE contaminated groundwater
- EPA & University CRADAs with other partners to develop technology to commercial application

Summary and More Information

- Expertise in Environmental Technologies
- EPA Research laboratories across the country: http://www.epa.gov/epahome/locate3.htm
- Opportunities for CRADAs, Licensing
- EPA Tech Transfer Internet: www.epa.gov/osp/ftta.htm

Federal Staff:

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Environmental Technology Verification (ETV) Program

Maggie Theroux, ETAV
Teresa Harten, ETV Director,
An EPA-University and Entrepreneur Roundtable
October 26, 2009

ETV Objectives

- **Provide credible performance information for commercial-ready technology to help solve high-risk environmental problems. Help -**
  - **Purchasers in making decisions to purchase innovative technologies**
  - **Policymakers and Regulators in making policy and permitting decisions for innovative technologies**
  - **Vendors/Developers in selling and further developing innovative technologies**
  - **Financiers in making investment decisions to support commercialization**

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ETV at a glance

ETV

- **420 technologies tested, 90 protocols completed since 1995**
- **Over 300 stakeholders active in advisory groups and technical panels**
- **Collaborations and vendor cost-sharing leverage ETV, generating 50% of total funds in 2004-7; 80-90% in 2008-9**
- **2006 case studies document and project outcomes for 15 technology categories verified**
- **www.epa.gov/etv … >1.5 M hits/year**
- **ETV international effort is in progress to develop a global verification system**

Six ETV Centers

- ETV Air Pollution Control Technology Center
  - *RTI International*
- ETV Advanced Monitoring Systems Center
  - *Battelle*
- ETV Drinking Water Systems Center
  - *NSF International*
- ETV Greenhouse Gas Technology Center
  - *Southern Research Institute*
- ETV Water Quality Protection Center
  - *NSF International*
- ETV– Materials Management and Remediation
  - *Battelle*

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Case Study for Drinking Water Treatment: Verify new membranes (microfiltration and ultrafiltration) for removal of microbials

- Up to 2,200 small drinking water systems need options to meet EPA's Long Term 2 Enhanced Surface Water Treatment Rule; conservative estimate.
- 3 microfiltration and 6 ultrafiltration membranes were verified.
- City of Pittsburgh used ETV results to purchase full scale system and declared savings of $5M over conventional treatment.
- At 25% market penetration (550 systems) of ETV verified membranes:
  - Save $1 to 8M in pilot testing
  - Prevent 2,700 to 13,000 cases of cryptosporidiosis/yr and 0.3 to 2 deaths/yr
  - Realize economic benefits from health savings of $2 to 19M/yr.
- Verifications to be complete for 4 new membranes in Fall, 2009.

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ETV

ETV Contact Information

- **Teresa Harten, Director, ETV**
  513-569-7565
  harten.teresa@epa.gov

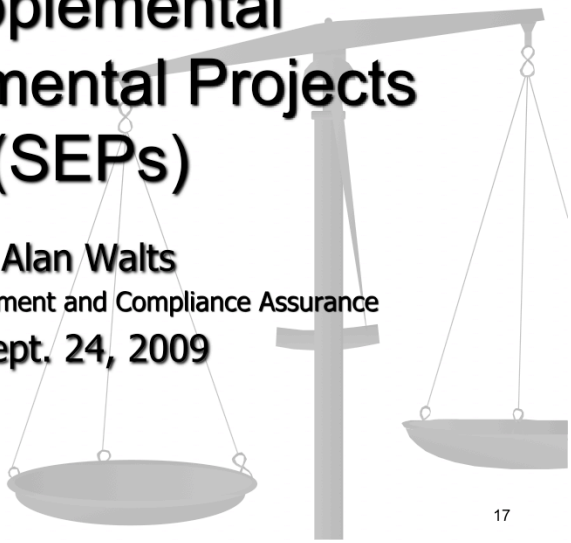
- **Maggie Theroux, Environmental Technology Assessment & Verification (ETAV) staff member**
  617-918-1613
  theroux.maggie@epa.gov

ETV web site: www.epa.gov/etv

Technology Innovation in Enforcement: Supplemental Environmental Projects (SEPs)

Alan Walts
Office of Enforcement and Compliance Assurance

Sept. 24, 2009



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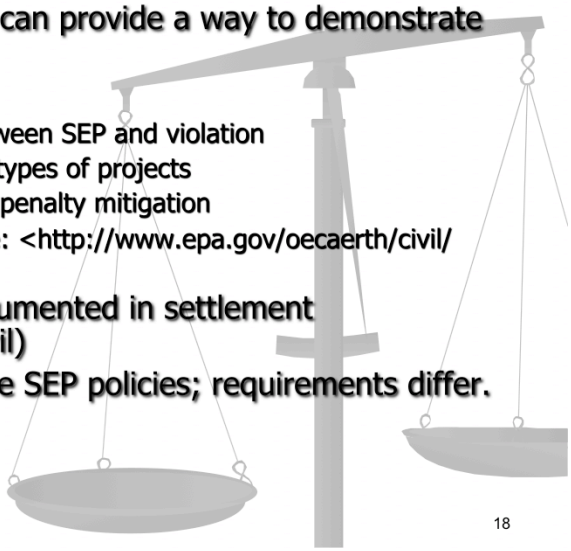
SEPs: Why and When

- Enforcement actions can provide a way to demonstrate new technologies.
- EPA's SEP policy:
  - Requires "nexus" between SEP and violation
  - Identifies acceptable types of projects
  - Determines extent of penalty mitigation
  - Policy available online: <http://www.epa.gov/oecaerth/civil/seps/index.html>
- Agreed SEPs are documented in settlement (administrative or civil)
- Many states also have SEP policies; requirements differ.



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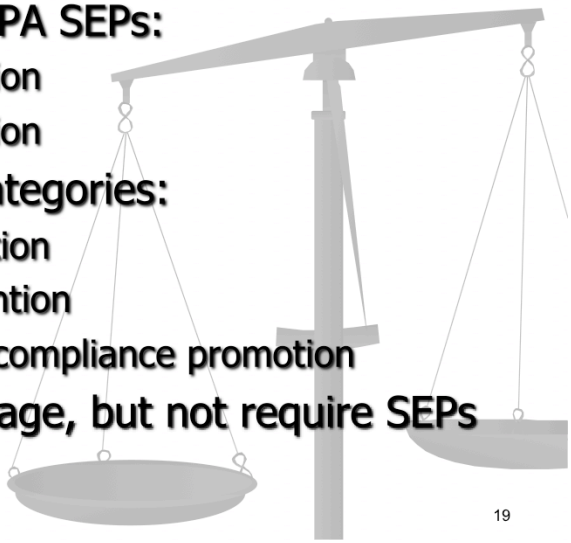
Use for innovative technologies

- Total value of EPA SEPs:
  - 2007: $30 million
  - 2008: $39 million
- Relevant SEP categories:
  - Pollution reduction
  - Pollution prevention
  - Environmental compliance promotion
- EPA can encourage, but not require SEPs



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Where is the market?

- SEP Project Idea 'banks' (EPA, States)
  - List available at EPA's SEP website
- National and regional enforcement priorities
  - Indicate sectors where EPA is targeting enforcement
  - <http://www.epa.gov/compliance/data/planning/priorities/>

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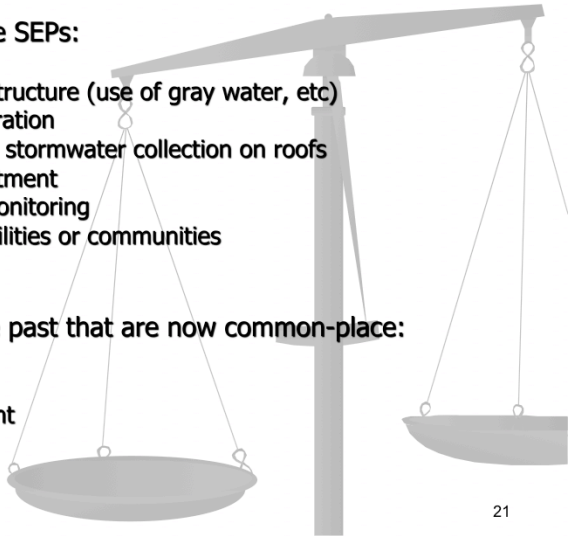
Examples of innovative technology SEPs

- Some ideas for innovative SEPs:
  - green building practices
  - sustainable water infrastructure (use of gray water, etc)
  - carbon capture/sequestration
  - solar roofs, green roofs, stormwater collection on roofs
  - wind/solar energy investment
  - continuous emissions monitoring
  - pollution sensors for facilities or communities
  - water filtration
- Innovative SEPs from the past that are now common-place:
  - Diesel retrofits
  - wood stove buy-backs
  - small engine replacement



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