



**FY 2011-2015 EPA Strategic Plan
Cross-Cutting Fundamental Strategy:
Advancing Science, Research, and Technological Innovation**

Advance a rigorous basic and applied science research and development agenda that informs, enables, empowers and delivers innovative and sustainable solutions to environmental problems. Provide relevant and robust scientific data and findings to support the Agency's policy and decision-making needs.

The major challenges we face to human health and the environment are not incremental problems, and they do not lend themselves to incremental solutions. EPA will promote innovative solutions to environmental problems that reduce or eliminate pollution while avoiding unintended and/or unwanted consequences, addressing pollutants, chemicals, and materials throughout their life cycle from raw material to final disposition.

The Office of Management and Budget (OMB) has reiterated the critical and timely need for innovation in science and technology, building on the President's *Strategy for American Innovation*. [1][2] OMB identifies priorities that include new approaches to multi-disciplinary research, new approaches for accelerating technology commercialization and innovation, interagency and international collaborations, and better communication with the public on science, technology, and innovation.

Environmental sustainability is a guidepost for science, research, and technological innovation at EPA.[3] Sustainability is a broader approach to environmental protection that considers trade-offs in production processes and materials use. Sustainable solutions prevent chemicals from entering the environment or eliminate, rather than simply reduce, the production of waste through better materials management.

EPA must help drive high quality research, sound science, and technology innovation to sustainably address air quality, climate change, water quality and quantity, unreasonable risks from toxic chemicals, ecosystem degradation, and other environmental issues. EPA will inform, enable, and stimulate the development of sustainable solutions to current and future challenges because sustainable and innovative environmental solutions can also be more economically efficient.

EPA science and research must always inform the decisions that are essential to the protection of human health and the environment and empower the broader community that supports our mission. To address challenging environmental problems in this manner, EPA research will:

1. **Provide timely, responsive, and relevant solutions:** EPA's science, research, and technological innovation depend on partnerships and a continuing dialogue with internal and external partners and stakeholders to ensure that EPA efforts focus on the highest priority problems faced by the Agency and the nation. Building on traditional collaboration efforts, EPA will also leverage the scientific discoveries of others to achieve even more responsive solutions to the environmental problems that our communities face.
2. **Transcend traditional scientific disciplines:** A broad perspective—one that integrates knowledge from a wide variety of sources—is key to developing sustainable solutions. In all aspects of our work, from problem identification, to research design and conduct, to implementation and adoption of solutions, EPA must rely on diverse disciplines. Environmental problems often

raise complex scientific and technological issues that require non-traditional approaches. If EPA is to advance progress on these challenging problems, we must rely on integrated, trans-disciplinary research that complements traditional, single-discipline approaches.

3. **Communicate widely and openly:** Great work, done invisibly, cannot have an impact. To maximize the impact and utility of our research, EPA will communicate the design, definition, conduct, transfer, and implementation of the work we do. We will translate our science so that it is accessible, understandable, relevant to, and used by stakeholders and the general public. EPA must document our successes to maximize the value of our scientific work.
4. **Catalyze sustainable innovation:** EPA's efforts alone will not be enough to address the environmental challenges our nation faces. As we develop and promote these technology innovations, EPA must account for life-cycle perspectives and support technologies that fully consider environmental and social impacts, and collaborate with partners in academia, government, and industry to assess impacts and promote effective product stewardship. EPA must also guide sustainable solutions on the path from conceptual and proof-of-concept stages, through research and development, to commercialization and deployment. EPA must understand and engage the marketplace to ensure the effectiveness of these solutions. Additionally, EPA must be receptive to external innovations in science, research, and technology that can enhance EPA's effectiveness in fulfilling our mission.

End Notes:

[1] OMB Memorandum M-10-30, July 21, 2010. "Science and Technology Priorities for the FY2012 Budget." Available at <http://www.whitehouse.gov/sites/default/files/omb/memoranda/2010/m10-30.pdf>.

[2] Press Release from the White House Office of the Press Secretary, September 21, 2009. "President Obama Lays Out Strategy for American Innovation." Available at http://www.whitehouse.gov/the_press_office/President-Obama-Lays-Out-Strategy-for-American-Innovation/.

[3] Information on the EPA Sustainability Program is available at <http://www.epa.gov/sustainability/>.

FY 2013 Action Plan: Advancing Science, Research, and Technological Innovation

This Action Plan lists the specific actions that EPA will carry out in FY 2013 to achieve the goals of the Strategy for Advancing Science, Research, and Technological Innovation as described in the FY 2011-2015 EPA Strategic Plan. Annual Action Plans will be developed for each year of the Plan.

1. Integrating sustainability into EPA policies and programs: Sustainable approaches consider economic, environmental, and societal factors over the long term and can be effective in dealing with complex, multi-media environmental problems. For this reason, EPA strives to integrate sustainability more fully into its policies and programs. Whenever possible, EPA will integrate the principles of sustainability in our science, research, and technology to enhance our effectiveness in fulfilling our mission (*Supports Principles 4*). Key actions in FY 2013 include:
 - Integrating Sustainability Principles into EPA: In FY 2013, EPA will establish a committee under the EPA Executive Management Council (EMC) to coordinate how to integrate sustainability principles into EPA's programs and policies and to develop an implementation plan by June 30. In addition, the committee will work in collaboration with the Office of the Chief Financial Officer and the Strategic Plan Core Team to provide early input and develop specific recommendations by March 2013 for integrating sustainability into FY 2014-2018 EPA Strategic Plan development.
 - The Office of Research and Development (ORD) will complete and release a report featuring methods and tools for analyzing sustainability issues. This report will help Agency employees and others better integrate sustainability into their decisions, thus allowing the Agency to more

effectively protect human health and the environment and to better promote sustainable solutions.

- ORD's Nitrogen and Co-pollutant Science Integration: ORD, Office of Water (OW), Office of Air and Radiation (OAR), and the Regions are developing an integrated, systems-based approach to reactive nitrogen and co-pollutant management. The goal of this "EPA Nitrogen Research Roadmap" is to protect human health and public welfare, along with ecosystem health, through the restoration of air and water quality. EPA intends to accomplish this by integrating Agency research to inform decisions and policies that impact the regulation or management of nitrogen and co-pollutants. The Nitrogen Roadmap will create a path for unifying and integrating EPA efforts across multiple media and across temporal and spatial scales in an economically-efficient, socially-acceptable, and environmentally-sound manner. Demonstrations of this effort are anticipated in the Narragansett Bay Watershed, the Mississippi-Atchafalaya River Basin, and the Northern Gulf of Mexico.
 - o EPA will finalize the Nitrogen Research Roadmap (August 2013).
 - o EPA will complete additions to the EnviroAtlas, including atmospheric modeling inputs (using the Community Multiscale Air Quality Model), data from the national nitrogen inventory, and modeling inputs of crop nutrient requirements (using the Environmental Policy Integrated Climate Model) (September 2013).

2. Promoting innovative science and technologies: In FY 2012, EPA issued its Roadmap, *Technology Innovation for Environmental and Economic Progress*. This document reflects the Agency's commitment to innovative, cost-effective, sustainable approaches to protect public health and the environment while also promoting economic growth. This Roadmap also highlights the need for EPA to engage the private sector and the investor community to catalyze technology innovation and deployment (*Supports Principles 1, 2, 3, and 4*). Key actions in FY 2013 include:
 - Technology Network: A cross-Agency Technology Innovation Network now serves in a central role for sharing and operationalizing technology innovation. Under its workplan, the Network will: (1) identify actions to catalyze innovation by surveying at least four initial pilot areas (biodigesters and biogas, air sensors, the energy efficiency/wastewater treatment nexus, and the automotive supply chain); (2) develop an internal system to better share EPA-related technology projects and activities; (3) draft and begin to implement an external communications strategy; and (4) publicize a list of market opportunities to promote private sector investment.
 - Targeted Stakeholder Engagement: Identify opportunities to facilitate stakeholder collaboration to accelerate the development and adoption of technologies to achieve both environmental protection and economic growth. These opportunities will emerge throughout the year. For example, the May 2012 Technology Market Summit featured three environmental area case studies where technology and innovation can accelerate solutions and promote new cost-effective approaches to environmental protection while also improving the economy and creating jobs. In early FY 2013, these three areas were identified as pilot areas for both the new agency-wide Technology Innovation Network that was established under EPA's Technology Roadmap (www.epa.gov/envirofinance/EPATechRoadmap.pdf), as well as a newly formed public-private partnership on Technology Innovation and the Environment that EPA will join by December 2012, adding greater visibility and more focused attention to environmental technology innovation and deployment.
 - Confluence, the Water Technology Innovation Cluster: [Confluence](http://watercluster.org/wordpress/) is a public-private partnership that is working to catalyze water technology commercialization and economic development in the greater Cincinnati-Dayton, Ohio, Northern Kentucky, and Southeast Indiana region (<http://watercluster.org/wordpress/>). Lead federal partners are EPA and the Small

Business Administration. In FY 2013, ORD is continuing to conduct research and develop technologies within its Safe and Sustainable Water Research (SSWR) Program in support of the Confluence as a global water technology innovation hub. ORD will also share the results of its Small Business Innovation Research solicitation and awards with stakeholders in the region.

- o In FY 2013, as part of SSWR, the Agency will award a contract for a Small Drinking Water Systems Ultraviolet Technologies Demonstration Study. This will also act as a pilot of Confluence's tri-state technology adoption cooperation agreement (Ohio, Kentucky and Indiana). Concurrently, ORD's National Center for Environmental Research (NCER) has released a competitive national solicitation for Innovative Water Treatment Technologies for Small Utilities to further fulfill Agency commitments to the cluster.
 - Clean Air Technology Initiative: Region 9 will help bring new clean air and energy technologies to market. Region 9 will continue to serve as an active partner in the Clean Air Technology Initiative along with the California Air Resources Board, the California Energy Commission, and several other local, state, and federal agencies to help bring to market new clean air and energy technologies. This partnership will use innovative solutions and non-traditional forms of funding to test and demonstrate technologies that have the potential to result in major emission reductions in California and beyond.
 - o EPA will support grants on low-emission goods movement and non-road technologies that will bring, once fully adopted, significant emission reductions.
 - o EPA's Region 9 will also support a Technology Symposium and Funders Forum to identify ways to deploy the necessary technologies and resources to meet EPA's air quality health goals.
 - o Region 9 will fund four to five early-stage, advanced technology demonstration projects. Though a competitive request for proposal (RFP) in the San Joaquin Valley, two to three of these funded projects may include the initial testing of alternative-fueled or electric-powered technologies such as on-road and non-road trucks and construction equipment, as well as a biogas waste-to-energy project.
 - Next Generation Air Monitoring (NGAM) Workshop: Region 6 and ORD will conduct an innovative workshop in November 2012 on Next Generation Air Monitoring (NGAM). The workshop will foster interaction between EPA's Regions, ORD, Office of Air and Radiation, and the Office of Enforcement and Compliance Assurance. The EPA entities will discuss ways to work together to bring promising air monitoring technologies and methods to fruition in the most efficient manner. The goal of the NGAM workshop is to collaboratively inform and stimulate concepts in low-cost, highly-portable sensors for use by citizens, community groups, schools, researchers, government agencies, and industries.
3. Communicate widely and openly: Make our science accessible, understandable, relevant to, and useful for the Agency, stakeholders, and the general public. For our science to have an impact, EPA will widely communicate the work we do (*Supports Principle 3*).
- Decision Support Tools: Ensure that the most up-to-date methods, models, tools, and databases are publicly available on EPA's website. In FY2013, models, methods, tools and databases will be reviewed for their relevance to EPA's research efforts and posted to a reorganized web page; this reorganization will allow for the most high profile decision support tools to be organized and displayed in a way that will be most useful to the user community. Also in FY 2013, communication strategies will be developed for new tools like EnviroAtlas and the Stormwater Calculator as they come on line. Included in the communication strategies will be measures to assess the effectiveness of the outreach.