NATIONAL ACADEMY OF SCIENCES
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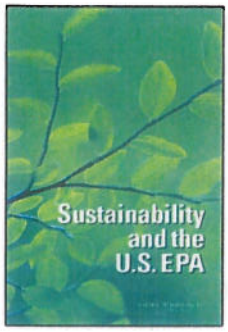
XII

REPORT IN BRIEF

"Green Book"

Sustainability and the U.S. EPA (2011)



The U.S. Environmental Protection Agency (EPA) has been working to create programs and examine applications in a variety of areas to better incorporate sustainability into decision making at the agency. To further strengthen the analytic and scientific basis for sustainability as it applies to human health and environmental protection, EPA asked the National Research Council (NRC) to convene a committee under the Science and Technology for Sustainability Program to provide an operational framework for integrating sustainability within EPA's responsibilities. EPA tasked the committee with four key questions to be answered in the development of the framework:

- What should be the operational framework for sustainability for EPA?
- What scientific and analytical tools are needed to support the framework?
- How can the EPA decision-making process rooted in the risk assessment/risk management (RA/RM) paradigm be integrated into this new sustainability framework?
- What expertise is needed to support the framework?

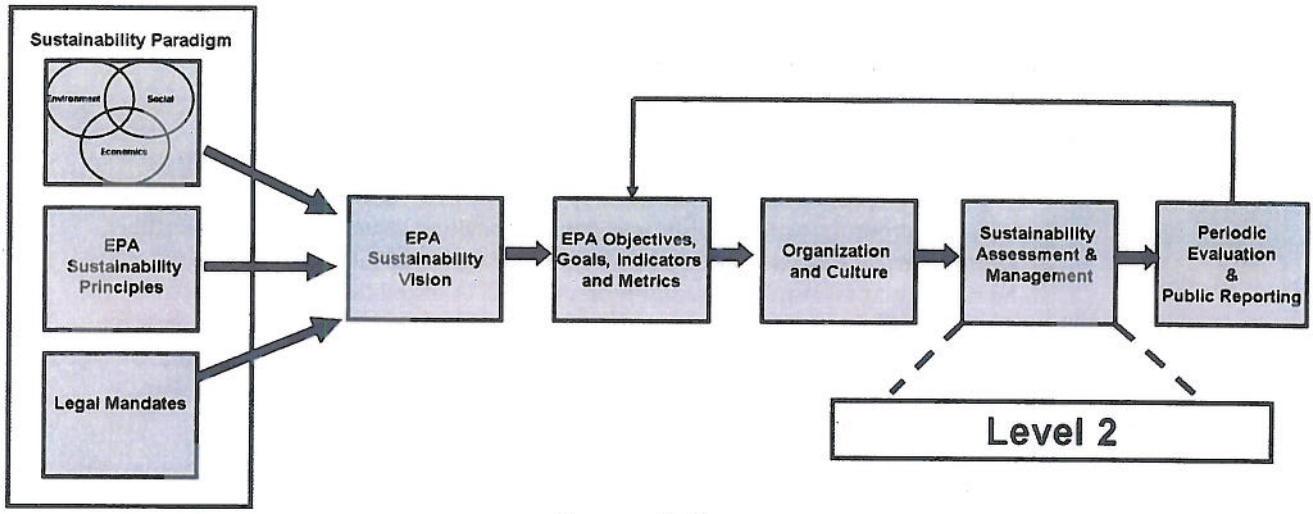
EPA suggested that the committee draft its recommendations in a manner following the 1983 NRC report *Risk Assessment in the Federal Government*, otherwise known as the "Red Book", which provided the agency with a framework for risk assessment and risk management that served as a driver for EPA's activities and for environmental regulations.

EPA can claim success in developing several processes in support of sustainability initiatives. It has established sustainability programs at the program office and regional levels and has adopted a sustainability research plan and highlighted sustainability in its strategic plan for 2011–2015. The agency has also examined applications in a variety of areas to better incorporate sustainability in its decision making, programs, and operations. At the same time, to obtain the full benefits of using sustainability as a process and as a goal, the agency needs to institutionalize it more broadly into its activities.

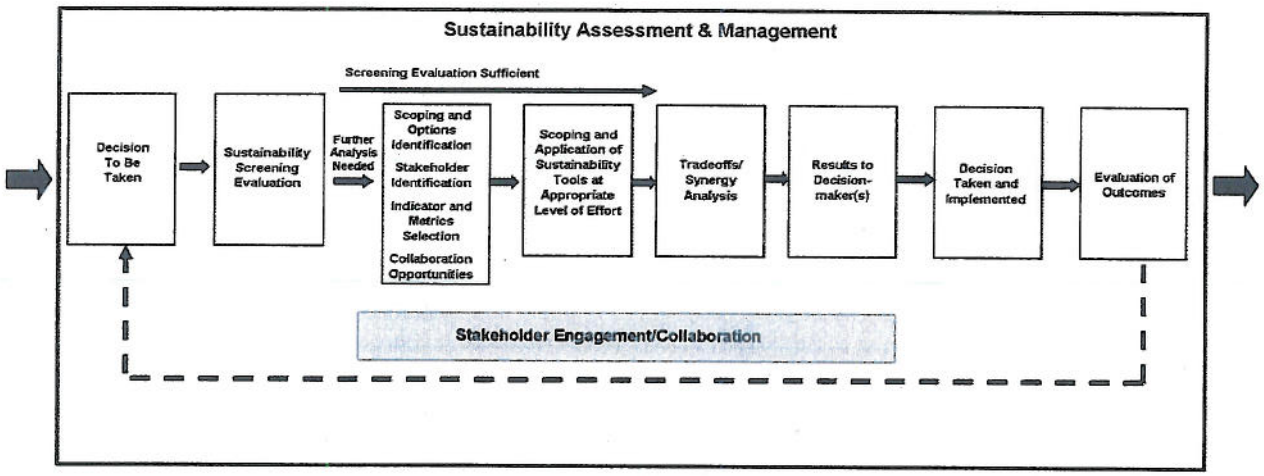
The committee developed the Sustainability Framework and the Sustainability Assessment and Management (SAM) approach to provide guidance to EPA on incorporating sustainability into decision making. The adoption of the Sustainability Framework and the application of the SAM approach to particular EPA programs, activities, and decisions are, of course, discretionary; the committee expects that EPA will choose where to focus its attention and resources in operationalizing sustainability and in implementing its agenda and will adapt the scale and depth of the assessment according to the type of decision and its potential impact. As with all decision making at EPA, the approach needs to be transparent and key stakeholders need to be engaged.

SUSTAINABILITY FRAMEWORK

Level 1



Level 2



The primary purpose of the Sustainability Framework is to support and guide EPA's actions to further sustainability goals. As shown above, the framework is organized into a two-level process. Level 1 consists of the following components that define the agency-wide process: the "three pillars" sustainability paradigm and the principles and legal mandates that feed into the process; EPA's sustainability vision, goals, and organization; the Sustainability Assessment and Management (SAM) approach; and periodic evaluation and public reporting activities. Level 2 articulates the elements of the SAM component, which is intended to be equally applicable to human health, ecological risks and other challenges. SAM is designed to be comprehensive, systems-based, and intergenerational, and the process solicits stakeholder involvement and collaboration. It is driven by sustainability principles and goals and involves setting, meeting, and reporting on measurable performance objectives. The SAM process should be undertaken for major decisions that could have large impacts on multiple pillars of sustainability.

KEY FINDINGS AND RECOMMENDATIONS

What should be the operational framework for sustainability for EPA?

- The proposed Sustainability Framework requires a comprehensive approach including specific processes for incorporating sustainability into decisions and actions
- EPA should incorporate into its decision making upfront consideration of sustainability options and analyses that cover the three sustainability domains (social, environmental, and economic), as well as trade-off considerations
- The framework was developed with the intent that EPA could apply it to any decision to which a need arose

What scientific and analytical tools are needed to support the framework?

- The committee recommends EPA develop a "sustainability toolbox" that includes a suite of tools for use in the Sustainability Assessment and Management approach.
- Collectively, the suite of tools should have the ability to analyze present and future consequences of alternative decision options on the full range of social, environmental, and economic indicators.
- Application of these tools should have the capability for showing distributional impacts of alternative options with particular reference to vulnerable or disadvantaged groups and ecosystems.

Examples of Tools

- Risk Assessment
- Life-Cycle Assessment
- Benefit-Cost Analysis
- Ecosystem Services Valuation
- Integrated Assessment Models
- Sustainability Impact Assessment
- Environmental Justice Tools
- Present and Future Scenario Tools

How can the EPA decision-making process rooted in the risk assessment/risk management (RA/RM) paradigm be integrated into this new sustainability framework?

- The committee recommends EPA include risk assessment as a tool, when appropriate, as a key input into its sustainability decision making

Interface between Risk and Sustainability

- Committee separated risk assessment (RA) from risk management (RM)
- Four step RA paradigm reaffirmed as a valuable tool for sustainability
- Committee noted that RM used in two ways currently: a formal description of EPA's policies related to control of environmental risk and an informal term denoting any EPA approach to management of current or potential threat
- Sustainability goes beyond RM as sustainability is primarily concerned with maximizing benefit, while addressing risks of concern, rather than being an exercise focused mainly on achieving risk based standards

What expertise is needed to support the framework?

- The committee recommends that EPA hire multidisciplinary professionals who have experience in the development and implementation of the sustainability assessment tools described, and who have a working knowledge in all three pillars and their application to environmental issues
- The agency should hire leaders and scientists including those from outside sectors to aid the agency in shifting to a more cross-cutting mind set

Changing the Culture of the Agency

- Foster change and innovation at all levels of EPA
- Learn from others and from what you are doing
- Broaden disciplinary approaches toward understanding underlying processes
- Consider longer term time horizons

- Although EPA has existing staff in the main sustainability-related fields, the agency should further facilitate collaboration among existing professional expertise to encourage dialogue and understanding of the various fields and work already being done within EPA
- EPA should institute a focused program of change management to achieve the goal of incorporating sustainability into all agency thinking to optimize the social, environmental, and economic benefits of its decisions, and create a new culture among all EPA employees

Definition of Sustainability

The 1969 National Environmental Policy Act (NEPA) declared that the "continuing policy of the Federal Government" is to "create and maintain conditions, under which human and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations" (42 U.S.C. 4331(a))

This is now described as sustainability and was reaffirmed in Executive Order 13514

Committee on Incorporating Sustainability in the U.S. Environmental Protection Agency: Bernard Goldstein (IOM), Chair, University of Pittsburgh; **Leslie Carothers,** Environmental Law Institute; **J. Clarence Davies,** Resources for the Future; **John Dernbach,** Widener University School of Law; **Paul Gilman,** Covanta Energy Corporation; **Neil Hawkins,** The Dow Chemical Company; **Michael Kavanaugh (NAE),** Geosyntec Consultants; **Stephen Polasky (NAS),** University of Minnesota; **Kenneth Ruffing,** Independent Consultant; **Armistead Russell,** Georgia Institute of Technology; **Susanna Sutherland,** City of Knoxville; **Lauren Zeise,** California Environmental Protection Agency. NAS Staff: Marina Moses, Director, Science and Technology for Sustainability Program; Pat Koshel, Senior Program Officer; Jennifer Saunders, Program Officer; Dominic Brose, Associate Program Officer; Emi Kameyama, Program Associate; Dylan Richmond, Research Assistant; Ruth Crossgrove, Senior Editor; Mirsada Karalic-Loncarevic, Manager, Technical Information Center

Science and Technology for Sustainability (STS) Program

The National Academies' Science and Technology for Sustainability Program (STS) in the division of Policy and Global Affairs was established to encourage the use of science and technology to achieve long-term sustainable development. The goal of the STS program is to contribute to sustainable improvements in human well-being by creating and strengthening the strategic connections between scientific research, technological development, and decision-making. The program concentrates on activities that are cross-cutting in nature and require expertise from multiple disciplines; important both in the United States and internationally; and effectively addressed via cooperation among multiples sectors, including academia, government, industry, and non-governmental organizations (NGOs).

For More Information

Copies of *Sustainability and the US EPA* are available from the National Academies Press; call (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area), or visit the NAP web site at www.nap.edu. For more information on the project, contact staff at (202) 334-2143 or visit the Science and Technology for Sustainability Program's web site at nas.edu/sustainability.

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